9th edition

AUSTRALIAN PROFESSIONAL SNOWSPORT INSTRUCTORS

Alpine Teaching Manual

AUSTRALIAN PROFESSIONAL SNOWSPORT INSTRUCTORS TEACHING MANUAL

Ninth Edition 2014

The Australian Professional Snowsport Instructors Inc. (APSI) is an incorporated, non-profit member organisation whose primary function is the education, training and certification of Australian snow sport instructors.
The APSI offers programs in Alpine, Snowboard, Nordic, Telemark, Adaptive and Coaching disciplines.

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ALPINE TEACHING MANUAL

AUSTRALIAN PROFESSIONAL SNOWSPORTS INSTRUCTORS

9th Edition

INCORPORATING CHILDREN'S, ADAPTIVE AND TELEMARK TEACHING

www.apsi.net.au

ACKNOWLEDGEMENTS

This manual is the result of many years of effort by numerous people.
As snowsport teaching evolves so does the presentation and content of this manual.

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To all the other people who contributed to the effort of making this manual and the past editions possible, we thank you.

FOREWORD

After almost 20 years working as an APSI trainer I have come across some exceptional instructors with a wealth of knowledge on how to help their guests enjoy skiing. The years of experience that these great instructors have has given them time to hone their skills and try new teaching ideas. This would have to be a major factor as to why they are so ‘great’.

In this fast paced world of ours newer instructors often do not have the time to wait for experience to catch up with them, it would suit our guests better if we could all be great instructors sooner.

This manual is a culmination of the knowledge gained from many of those experienced instructors broken down into easily digestible chunks to help increase your experience base in a shorter time. I have been involved in numerous editions of the manual over the years and this would have to be the most comprehensive, innovative and visually stimulating edition to date.

I hope you all enjoy it!

Andrew Rae

APSI General Manager

INTRODUCTION:

The APSI teaching manuals have been the backbone to an instructor's knowledge for many years in Australian ski teaching. I vividly remember my first season teaching at Blue Cow and toting around my APSI manual on a daily basis. The manual accompanied us during our rookie season everywhere, from on-hill training sessions to tech talks in the Cowpuccino coffee shop and the journeys on long ski tube rides to and from the mountain. By the end of that first winter they barely resembled a physical book and looked more like the papers scattered across a newsreaders desk. These torn and tattered materials, now held together by copious amounts of duct tape, can still be found on my shelf today and have become an invaluable part of shaping me as a professional instructor.

The snow sport landscape continues to evolve with innovations and changes to equipment, snowmaking, grooming and terrain building. So too should our ideas on how to best utilise these changes to make skiing easier and more enjoyable for our resort guests. This 9th edition of the APSI alpine teaching manual embodies this evolution in addition to utilising the depth of knowledge within our Technical Committees, National Demonstration Teams, Trainers/Examiners, our broad membership base and collaborative partners from around the world.

Becoming a great instructor will take time and exposure to different experiences and influences. Personally, I've had many great mentors who helped guide me throughout my teaching career. It's important for you to build on the information in this manual by seeking advice from your resort trainers, mentors and ultimately developing your own approach to conducting exceptional lessons. Regardless of where you are on the pathway to becoming a great instructor, this manual can be used as both a foundation to get you started and a guide for future reference.

The Alpine Teaching Manual has eight specific chapters:

- **Professionalism**
- **Teaching Concepts**
- **Technical Concepts**
- **Teaching Children**
- **The Alpine Progression**
- **Adaptive Snowsports**
- **Teaching Telemark Skiing**
- **General Knowledge**

Information within these chapters can easily be found in the 'table of contents' and on the side tab of each page, as a quick reference guide when flicking through the book. Some information within the text may also be cross referenced with other sections. For instance, a note in the children's chapter may have a longer description within the technical concepts chapter. In this case a reference will be noted (e.g. 3.1.7; phases of the turn), this way you can flick back and look it up for further reading.

Icons will also be used beside the text to highlight its importance or intended use.

- **A children's specific icon**
- **The important icon (not to be missed and will include safety, terrain and general important notes)**
- **The mountain icon (which means this is worth trying on hill during your lesson)**
- **Steering**
- **Carving**
- **Pure carving**
- **Freestyle**
- **Racing icons**

This manual should form the basis of your study as a ski instructor. You can read it from cover to cover as it is a collection of great ideas assembled over many years. However, to get the best out of this resource you will need to create your own lesson plans using the multitude of progressions, corrective exercises, teaching tactics, mechanics and professional advice that personally motivates you.

Good luck with all of all your skiing adventures and training in the years to come, myself and the entire APSI staff look forward to supporting you and your goals throughout your career. It's our hope that this 9th edition of the APSI alpine teaching manual will in some way help to inspire the next generation of instructors to ignite a lasting passion for snow sports with their guests. Ultimately converting all of our students into lifelong snow sport enthusiasts, just like us.

Richard Jameson

Alpine Technical Director

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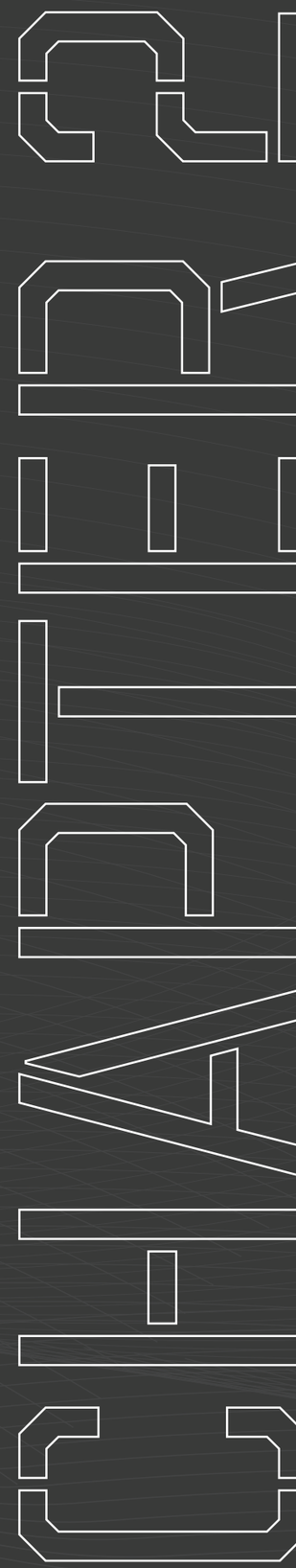
Introduction

ABOUT THIS CHAPTER

Chapter 2, teaching concepts: looks at our philosophy, system for teaching and how you can adjust your lesson to deal with different learners.



CHAPTER TWO: Teaching Concepts

SECTION ONE:

THE TEACHING SYSTEM

2.1.1 THE AUSTRALIAN TEACHING PHILOSOPHY

Australian snowsports instructors should strive to create and sustain a passion for snowsports within their guests. Our goal is to turn first time skiers into long term participants and eventually lifelong enthusiasts.

The core concept underpinning Australia's teaching philosophy involves connecting with the guest to provide a lesson where they walk away wanting more and attain the tools and abilities they need to ski on their own after the lesson. In essence, the philosophy aims to ignite a lasting passion for snowsports.

Some significant teaching philosophies that have underpinned Australian alpine ski instruction over recent years include:

Teacher centred: The teacher is the boss, they decide what should be learnt and how it will be learnt as they are the authority on the subject.

Student centred: The focus of the lesson depends predominantly on the students' goals and wishes and the instructor's role is to fulfil those goals in the best way possible.

Subject centred: Both teacher and student are involved in the learning process without pretence of superiority. The teacher finds out how the student learns and what works best for each student. Both teacher and student have to learn how to move into and within the learning segment by making it a shared learning experience. The teacher continuously watches how the student learns and takes to the subject and how the students are able to help each other with the learning process.

Experience centred: The instructor strives to give the guest an exceptional experience that is all encompassing of the alpine environment. It combines the safe class handling skills and useful exercises learnt from the teacher centred years, the relationship building qualities with customer service taken from the student centred years, combined with the professional, yet relaxed two-way learning atmosphere of the subject centred years.

The more personalised the experience the better the enjoyment, skill improvement and development of passion for snowsports.

The following is an example that highlights what could happen if the instructor does not personalise the experience, interfering with the learning process and inhibiting the chance to convert the guest into long term participants.

Case Study[18]

In 1978 Georges Joubert conducted an experiment to test how effective the French teaching system was.

He selected two groups of students that were closely matched in age, sex, background, etc. Both groups of students had never skied before. One group was given an instructor while the other was not. The only exposure to the sport that the group without an instructor had was the occasional skier that went past on the terrain they were skiing. Both groups skied exactly the same type of terrain and the experiment lasted a whole week.

To start with, the group with an instructor progressed more quickly. However, by the middle of the week the group without an instructor had caught up. By the end of the week the same group was much better than the group with an instructor. They also skied and moved more naturally, while the other group looked rigid and contrived.

How could this be? There are some clear reasons for this outcome. The group with an instructor obviously progressed more quickly to start with, because they were shown how to perform the basic manoeuvres, while the other group had to go through a process of trial and error to figure out how to 'ski'.

Once the group without an instructor had figured it out, they progressed more quickly and bonded more closely. They had a fantastic time laughing, making fun of each other and lost their inhibitions. Everybody had a turn without fear of embarrassment or failure and because the group had bonded they were constantly helping each other. Each time one of the members discovered something they would show the others, sharing the movements and associated feelings.

The entire group experimented with different movements and feelings (including those from related sports) and shared them with everybody. They were constantly watching each other and giving feedback. Each individual developed a higher level of intrinsic feedback, that is, they learned how to critique themselves. The group must have skied and practised at least 10 times more than the other group. The group bonding also allowed for greater interaction and discussion about each other's learning styles.

What is the moral of the story? Are we better off without instructors? Certainly not! We just have to be careful that we refrain from making the following mistakes that the instructor made with his group:

- **He failed to create a fun, relaxed and comfortable learning environment.**
- **His teaching style was more instructor-centred, rather than experience-centred therefore failing to personalise the experience for the guests.**
- **He failed to teach people how to learn (i.e. teach people how to become aware of the changes they experience).**
- **He failed to give his students enough practise and experimenting time to gain a feeling for the learning segment.**[19]

The effectiveness of classic teaching and learning theories will always be challenged. This is the nature of evolution and why the national instructing body (APSI) sends representatives to attend international conferences such as 'Interski'. This becomes a platform for our teaching system to improve by challenging and sharing ideas.

Creating personalised lessons for each guest requires highly developed instructor skills, for example, strong analysis and interpersonal skills and a knowledge of relevant progressions and/or exercises.

The following systems used in this teaching chapter, combined with the other segments in this manual, give you the building blocks to connect with each of your guests and hopefully turn them into lifelong snowsport enthusiasts.

[18] Abraham, 2000 [19] Abraham, 2000

2.1.2 THE AUSTRALIAN SYSTEM FOR TEACHING –'THE NINE LESSON ESSENTIALS'

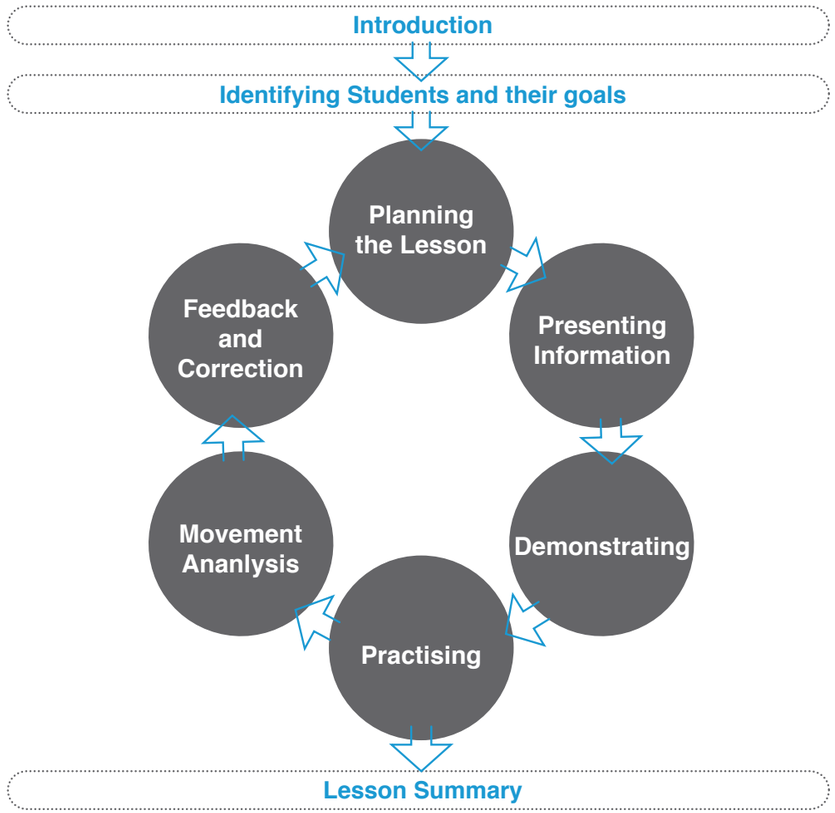
The Nine Lesson Essentials encompass the teaching system that you will use to conduct each lesson. This framework will help structure your lesson from start to finish delivering a professional product with exceptional learning outcomes.

A lesson simply cannot function well without proper application of the Nine Lesson Essentials.

'Looping through' or repeating the nine essentials: It takes considerable expertise to understand how to apply the Nine Lesson Essentials correctly. The 'introduction' and 'summary' are the only points that are covered once during a lesson, while the others are repeated any number of times. You are constantly evaluating the lesson with your students to decide which point to revisit.

It could be point two, to confirm that the students are happy with the lesson so far; three to re-plan the lesson; four to present something new; five to re-demonstrate; six to give them more practise; or seven to analyse their skiing again. Keep looping back and repeating the appropriate points until the time comes to summarise the lesson.

THE NINE LESSON ESSENTIALS:



2.1.2-1 INTRODUCTION

At the start of a lesson, students are often nervous or intimidated (especially if it is their first lesson) and observe you intently to determine your personality. It is essential that you display the skills learnt in 'professionalism' to elicit the students' trust. You should also present yourself in a manner that shows the students that you are human, not some 'snowsport god' who is too cool for their students, so they are comfortable opening up to you. Without trust and confidence in your abilities, a learning partnership cannot be formed and the lesson will not be set up for success.

The following points are covered in the introduction:

- **Introduce yourself in a welcoming manner.**
- **Learn the students' names.**
- **Involve the group by introducing your students to each other.**
- **Deal with the tickets (resort specific).**
- **For a first time lesson, give a lesson overview.**
- **For all other standards, first ask the students what they would like to learn or get out of the lesson. Based on this, you can give a lesson overview.**
- **Generally make them feel welcome.**

2.1.2-2 IDENTIFYING THE STUDENTS AND THEIR GOALS

This involves asking various open questions and using active listening skills to learn as much as possible about your students. You will need to utilise all of your communication skills.

The following can help you to establish an overview of your students:

- **Actively listen to the clients.**
- **Do not presume you know what they want.**
- **Be sympathetic to their goals but realistic.**
- **Check the conditions and client's skill level before you commit.**
- **Discuss a time frame.**
- **Group lessons may require some compromise and therefore some extra planning for the week.**
- **Review the clients' goals throughout the lesson.**

Find out the students' goals: Discovering students' goals is crucial to the success of the lesson. Every student has goals and if you fail to learn about them, the chances of providing a successful, personalised lesson are slim; as are the chances of convincing them to return for more lessons.

Here are some ways you can ask the students about their goals:

- **What do you want to develop or improve?**
- **What would you like to work on today?**
- **What are your goals for the lesson?**
- **What would you like to learn today?**
- **What are you expecting from our time together?**

Once the goals have been established you can decide on an appropriate lesson plan and propose this to the students. If the plan is generally accepted, then the lesson continues. If the plan is not accepted by all, you should revisit the plan until all the students are satisfied. It could be that their goals are not realistic or perhaps they can be met in a subsequent lesson.

A student's goals change throughout each lesson, so check constantly to ensure you are on the right track. Take opportunities such as lift rides (making a point of rotating lift rides with your students), standing in the lift queue or other breaks to ask questions about their goals.

A group lesson is often more challenging than a lesson with one person because you have to deal with ten different people and ten different goals.

Identifying the students: If every student were identical you would use the same teaching approach for all of them. While this is not the case, many instructors make the mistake of applying the same 'standard' lesson every time they teach, with little regard for each individual in the group.

The best teachers find out exactly what type of students they have. Then they draw from their vast knowledge, understanding and experience to construct, together with their students, the most appropriate lesson.

Here is what you should find out about your students throughout the lesson (it may take more than one lesson):

- **Where are they in the scale of athleticism?**
- **What is their fitness level?**
- **Do they take part in skiing related sports such as roller blading, waterskiing or surfing, etc?**
- **Where are they in the scale of aggressiveness?**
- **Are they confident or timid?**
- **Have they ever seen snow before?**
- **How do they learn? You must ask each student how they learn best. If they are unsure, help them become more aware of the learning styles (see 2.6.) This is essential to optimise learning.**
- **How motivated are they to learn? You may need to help motivate them to enjoy the sport.**
- **Have they had lessons before? How many?**
- **What did their last instructor teach them?**
- **What sort of personality are they? Do they like to be pushed? Do they prefer to be gently coaxed along?**

All of these points will greatly influence how you teach and how students learn. If you teach in an area of interest to the student, the likelihood of learning is much greater. As an instructor your task is to find what triggers the student.

It is also important to find out the guests' previous experience to help choose a progression that suits their needs. For a children's lesson you will need to find out their age and adjust your teaching style to make it age specific. If you are teaching a skier who has a disability, you will need to determine the characteristics of their disability and what special needs they may require.

Lift rides provide a good opportuity to engage with and learn about your clients.

2.1.2-3 PLANNING THE LESSON

Having received confirmation from the group that your broad lesson plan is satisfactory, you then go about planning the details of the lesson. The following points should be considered throughout the lesson:

- **What and where is the most suitable terrain?**
- **How are the snow conditions? Icy, un-groomed, slushy, size of moguls?**
- **What is the weather like? Temperature, wind direction, flat light?**
- **Class handling (see 2.1.3).**
- **Professionalism (Ch. 1).**
- **Teaching tactics and teaching styles (see 2.2.1 and 2.2.2).**
- **Learning styles (see 2.3.1).**
- **Age and ability.**
- **What progression and associated exercises to use to help the guest improve (Ch. 5).**

2.1.2-4 PRESENTING INFORMATION

It is a challenge, even an art, to be able to explain skiing in a clear and simple way. An inexperienced instructor easily falls into the trap of making the explanations too complicated, confusing or long-winded. The following key points will help you to deliver good explanations.

Many skiing concepts may be completely foreign to your students. Before they can even hope to attempt a new task, you have to give them a mental image or picture of the learning segment. A demonstration obviously serves this purpose extremely well.

It is always important to explain what, how and why you teach a certain aspect of skiing.

A survey showed that one of the biggest complaints in beginner lessons was that the students had no idea why they were being taught certain exercises or steps.

When explaining a task the best way to create an image is to use clever analogies and the following concepts:

- **Come up with analogies that will appeal to the different students in your group. For example, carving is like a formula one car that grips all the way around the corner or the way a bicycle corners; 'tail swishing' is like a rally car that throws the back out and skids around the corner.**
- **Keep it short and simple (KISS) and avoid talking too much.**
- **You need a thorough understanding of the mechanics of skiing. The more knowledge you have, the more simply you can explain skiing to your students.**
- **Use everyday words to express yourself.**
- **The explanation has to be appropriate for the age group that you are teaching. For example, a three-year-old, teenager or adult.**
- **Spend time rehearsing the explanations to yourself or your fellow instructors to ensure they are clear and concise and cover all the learning styles.**

- **Practise explaining the same concept in many different ways, because not all students comprehend in the same manner.**
- **Technical terms are often convenient to use and fun for the students to learn. Only use technical terms when appropriate and remember to explain to the class what they mean.**
- **Use your poles to draw diagrams in the snow to complement your explanations.**
- **Check to see if your students have understood the explanation by using open questions or by asking them to repeat the critical parts. Look out for students with a confused look.**

2.1.2-5 DEMONSTRATING

Demonstrating is as critical as presenting information because it is key for visual learners (see 2.3.1). To help you give the best possible learning outcome from your demonstrations consider the following:

- **Demonstrate clearly and cleanly so that the students can easily see the task you are asking them to do.**
- **If possible, demonstrate from different angles.**

- **Focus students' attention on the important part of the demonstration. Observing other skiers can also be beneficial to the learner.**
- **When skiing with your students, ski at the correct speed and demonstrate the same turns your group are working on that day.**
- **Practise demos or exercises yourself, as the correct movements are a must for people to learn from.**
- **Demonstrate often. One demonstration for every fourth student is an appropriate amount in a first timer lesson.**

- **Exaggerate when appropriate (correctly and incorrectly), to emphasise part of the technique.**

2.1.2-6 PRACTISING

There are many factors that influence the learning process. It may take numerous attempts before students gain an understanding of the task. After each attempt the level of understanding and feeling improves until there is a breakthrough.

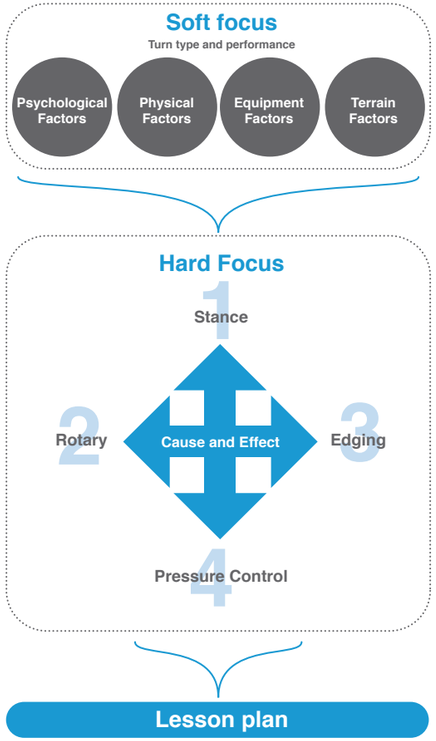
Research shows that the learning process is optimised when students are allowed freedom to experiment with the task and its related movements and feelings. The more ways you can show students how to perform the task, the more success you will have targeting the different learning styles. Allow the group to share their learning experiences with you and the rest of the group as you move through the learning phases.

This is also the time to enhance students' learning with different teaching styles and class handling methods. Ask students to try as many different formations as you can think of - have them pair up, ski behind each other, shadow each other or ski by themselves.

Practise in varied conditions. Studies have shown that deeper learning occurs if a skill is practised in different conditions.

Keep confirming with the group that the balance of teaching and practising is correct. You might be enthralled with what you are teaching, but in actual fact they would much rather be skiing and practising more, or vice versa.

THE MOVEMENT ANALYSIS SYSTEM:



2.1.2-7 MOVEMENT ANALYSIS

Whether in a snowplough turn or a dynamic short turn, skiing is made up of an appropriate blend of the four skills (see 3.1.2). To analyse a skier, you need to have a good understanding of how individual skills are performed, technical concepts and the mechanics of the turn. Understanding the interaction between the skills and how they affect each other, will help you determine a cause and decide on an appropriate solution.

Successful analysis can only happen if you:

- **Have a good understanding of the skiing skills and mechanics.**
- **Understand the movement analysis system.**
- **Possess a clear picture in your head of the correct movements of the turn.**
- **Understand where each turn fits into the performance model (3.2).**
- **Can distinguish the difference between the cause-and-effect of a problem.**

There are several ways to position yourself when analysing students. You can watch from below, from above, from the side, ski behind the student or synchronise with them. Each of these angles gives you a different perspective and can provide you with vital clues about their skiing.

SOFT FOCUS

Watch the first four or so turns to:

- **Determine what turns the student is making to both sides e.g. snowplough or parallel.**
- **Assess the performance the student is making and the general shape of their turn, e.g. 'Z' or 'S' shaped.**
- **Obtain a feeling for the overall attitude of the skier. Ask yourself if there is a non-skill related reason for the way they ski, such as:**

Psychological factors:

- **Fear (many reasons for comfort level)**
- **Age**
- **Unrealistic goals**

Physical factors:

- **Strength**
- **Fitness, fatigue**
- **Previous bad experiences (crashes or injuries)**
- **Disabilities**

Equipment factors:

- **Boots (size? done up properly?)**
- **Ski length**
- **Age of equipment**

Terrain factors:

- **Snow conditions (ice, powder, slush)**
- **Pitch (too steep, too flat)**
- **Convex or concave**
- **Bumps or varied conditions**

HARD FOCUS

After determining the overall attitude of the skier or the 'soft focus', you then need to examine the ski performance, i.e. how the ski moves in comparison to the 'performance model'. Watch to determine how each of the four skills are being performed and how this may help or hinder the desired performance.

Stance: watch to see how the centre of mass (skier weight) is positioned along the skis.

Rotary: watch the legs and upper body to see where the turning force originates from and how it is performed (e.g. smooth or jerky).

Edging: watch the ski performance and angulation (knee, hip and overall inclination).

Pressure control: the skier needs to balance over the outside ski so recheck the angulation (or lack of). Watch for smooth or jerky movements and whether the skier is being thrown around when dealing with terrain or the turn mechanics.

For terrain park features assess the approach, take-off, manoeuvre and landing (ATML).

Approach: The speed and 'line' the skier takes into a feature. Also includes the body's position. An approach can determine which side of a rail feature can be taken or which edge or set up turn is best to take-off a feature.

Take-off: The movements and timing used as the skier leaves the feature. The take-off projects the skier in the desired direction. This includes taking-off with flatter skis for straight airs and features or on an edge for specific manoeuvres and spinning.

Manoeuvre: The movements of the rider in the air or on the feature. A solid approach and take off will aid in the rider's ability to add style to their manoeuvres. Using core strength will aid in all manoeuvres and stabilise the skier during their flight.

Landing: How the rider touches down on the snow. This is the completion of the trick. Landing on top of your skis and being centred is a good feeling.

Finding the cause versus the effect by prioritising areas that need improvement

Always address a soft focus factor first. For example, a guest who has poor stance will never improve their stance if it is caused by fear of steep terrain. Therefore, it is imperative that you take them to easier terrain before attempting to fix their stance.

If all the soft focus factors look okay then decide which hard focus skill needs to be addressed. Assess each of the skills in the correct order to determine if a weakness in one area is preventing the following skills from being effective.

It is also important to examine how each skill interacts with the mechanics of the turn, look at the speed, the overall performance expectation and the timing or rhythm of the movements you are assessing:

- **Work on stance first: if it is poor enough to prevent the other three skills from being performed properly.**
- **Work on rotary skills first: if the stance is okay but the turning force originates from the upper body and the rotation causes hip angulation and edging to be lost.**
- **Work on edging skills first: if the stance is okay but the skis are so flat that the skier has trouble changing direction; or if the other skills are good but the skier is ready to go faster (like in carving where edging should be earlier and stronger).**
- **Work on pressure control skills first: if there is too much weight on the inside ski or if the skier gets thrown around too much (more applicable to upper levels).**
- **Work on ATML: if a manoeuvre is being attempted on a terrain feature.**

2.1.2-8 FEEDBACK AND CORRECTION

FEEDBACK

Feedback is the information received about the performance of a skill, either during or after the skill is completed.

Feedback can be external, from an outside source (e.g. instructor or fellow student), or internal, from the individual's sensory systems. The instructor's aim is to use external feedback to help train and develop the students' internal awareness. This is the only way true learning can occur. In other words, we are teaching them how to become a better learner.

A true learning environment is one where the instructor is not the only 'teacher'. The students are learning from you. Yet, you are also gaining knowledge about how your students learn. Encourage students to share feelings and ideas with each other. Always explain what, how and why you want them to make a change to their skiing.
For example, "I need you to edge the ski a little more **(what)** by pressing down on the big toe side of your foot **(how)**. This will allow you to control the speed more easily **(why)**."

Feedback will have more meaning if the guest understands what they did in the first place. We should strive to help the student become aware of what they were doing and how to correct it. By giving in-depth feedback, the students can reflect and compare what they felt to the instructor's feedback, which helps them develop their own internal feedback.

THE MANNER IN WHICH WE DELIVER THE FEEDBACK SHOULD BE:

- **Positive**
- **Simple**
- **Accurate**

Positive

Always start by giving the students positive feedback about their skiing, followed by advice on how to improve or progress to the next level.

Feedback should never degrade or humiliate but rather help and encourage the students to improve so that they enjoy the sport even more. You will need to allow students time to practise and experiment using carefully selected feedback and lots of encouragement.

Simple

Feedback must be simple. Even the best world cup athletes must have feedback given to them simply if a change is to occur. (KISS- Keep It Short and Simple).

Accurate

Accurate feedback depends on how good your analysis is. If you see exactly what is incorrect you can give accurate feedback. If you are not sure, the feedback becomes vague, incorrect or counterproductive.

CORRECTION

The mistakes need to be prioritised and then worked on one at a time. Refer to point two of the Nine Lesson Essentials (identifying the students) to help decide how to approach the correction. It is crucial that you consider these points (i.e. athleticism, attitude, personality, learning preference, etc.) carefully because they will greatly influence how you correct your student's skiing. The tactics to consider include:

- **Select terrain that is easy for the student.**
- **Appropriate snow conditions.**
- **Use a variety of appropriate exercises or mini-progressions to help correct the skills.**
- **Choose appropriate speed.**
- **Demonstrate clearly.**
- **Make sure their equipment is safe.**
- **Check that they understand your feedback by showing and explaining what is required and how to physically do the correct movements.**

At this point in the lesson it is time to loop back to one of the nine essentials e.g. you may ask your students to 'try it again' (lesson essential six - practise). Next you need to do seven and eight again to see if they understood the task. Loop back through the lesson essentials by going back to any of the other steps (except the introduction) and following the system again. It is an ongoing process until students can do the task or the lesson time is over, at which point you would move onto the summary.

2.1.2-9 LESSON SUMMARY

If you give a good lesson but fail to include a summary, the lesson is far from successful. The following points have to be covered in the lesson summary:

- **Briefly go over everything you covered during the lesson.**
- **Confirm which goals were and were not met.**
- **Provide a plan for a future lesson to cover the goals that were not met.**
- **Discuss all the improvements made.**
- **Repeat the plan for tomorrow or the next lesson.**
- **Give them some things to work on after the lesson and suggest where they should practise.**
- **Invite them to come back for another lesson. Self asses your lesson, a good question to ask the group is: "What will you tell your friends about your trip when you return home?"**

2.1.3 CLASS HANDLING

Class handling is the way you organise and manage the group throughout the lesson. It is a crucial component of the teaching system, vital to the success of the lesson and safety of the group.

It is even more important if the group is larger, has mixed abilities, space is limited or you are teaching children. Poor class handling can result in any or all of the following: bored students, limited actual learning or in the worst case scenario, an accident as safety has been compromised. Educating our students on the "Alpine Responsibility Code" (see 1.2.1) is also an important part of class handling. The elements of class handling are:

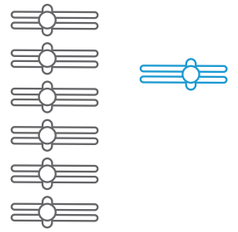
- **The way you line up your class.**
- **The way you ski the group down the hill.**
- **The way you analyse, give feedback and correct the group's skiing.**
- **Where and how you stop.**
- **Addressing mixed abilities.**

2.1.3A THE WAY YOU LINE UP YOUR CLASS

Always try to line the class up with their backs to the wind, snow and if possible, sun.

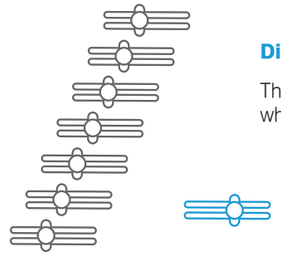
A well-structured and organised approach is particularly important if the resort is busy and terrain limited. This is the best way to conserve space and to keep the area safe. You will rely on your customer service skills and personality to keep the atmosphere relaxed and if possible an informal approach is more desirable.

This informal, less rigid approach creates a relaxed atmosphere where students feel more comfortable interacting with each other and with you. The importance of this cannot be emphasised enough because it is one of the fundamentals of experience centred teaching.



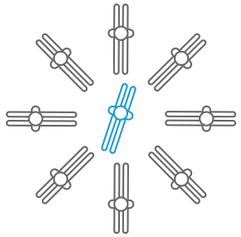
Line up:

This is well structured but is 'dictatorial' and can create a 'you vs. them' feeling. Good option for limited space situations.



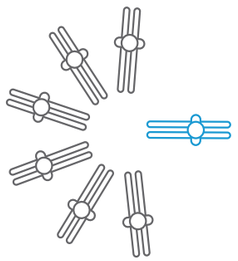
Diagonal Line up:

This helps everyone see when you are doing a demo.



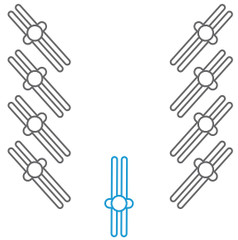
Instructor at the centre of the circle:

Good for beginner groups on the flat, although instructor must be careful to communicate with whole groups.



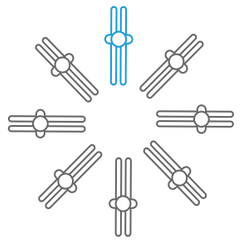
Semi-circle:

More informal. Students all feel like part of the group. Limits vision when moving off.



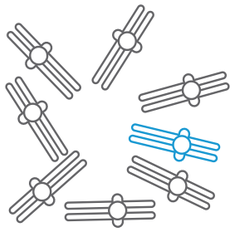
Corridor:

Good for large groups of beginners, especially for straight run exercises.



Instructor included circle:

Informal group feel but instructor is able to have visual and verbal communication with all students.



Huddle:

Informal. Good for advanced students or for a casual atmosphere.

2.1.3B THE WAY YOU SKI THE GROUP DOWN THE HILL

Before skiing off with the group, you must explain which method you are going to use.

The snake

Following the instructor in a snake is useful for the following reasons:

- **To lead the group from one place to another.**
- **To choose the best path down a tricky piece of terrain.**
- **To show the students the correct turn shape for skiing down a steeper run for the first time.**
- **To show the group where to turn e.g. on bumps etc.**
- **To give the students the chance to learn through watching and copying. Remember, only the first person behind you benefits so keep rotating the person following. Keep watching the students behind you so that you can give them feedback. A great way to watch the students is for you to ski backwards (being careful not to run into anyone/ anything) while the group follows in a snake.**
- **Be careful to avoid taking up the whole slope when skiing your group down in a snake. If there is nobody on the slope you can take up more room, however, if it is busy you should stay to the side of the run with your group.**

Skiing down as a group

The students free ski down to concentrate on and practise their own skiing. Designate a place where you will meet again. This will need to be a clearly defined place on the hill when teaching children, not just by saying "ski for 20 metres", as this doesn't make sense to them. To avoid collisions have the students give each other enough space.

This is an excellent way to have students try out a new skill and start developing a feeling for it.

For correct learning to take place, the student has to develop an awareness of their performance and this is achieved through considerable guided practise. If the lesson is mostly analysing and standing around, actual practise is limited and learning will be greatly reduced.

Combination of the above two

You can also mix it up by having one or two students follow you and the rest free ski down on their own. Take turns with this method.

Student leader

One of the students leads the group in a snake while you ski around the group to analyse and give them feedback.

2.1.3C THE WAY YOU ANALYSE, GIVE FEEDBACK AND CORRECT THE GROUP'S SKIING

Call Down

Calling students down one at a time, with lengthy feedback as they come down is obviously very thorough but there are a few reasons why you should not use this method:

- **It is very slow and the students stand around for most of the lesson.**
- **Often there are several students with the same or similar mistakes so you end up explaining the same thing over.**
- **The students who come down later miss out on hearing what you say to the earlier ones and miss learning from each other.**
- **Performing in front of others can create a 'mere presence effect' that heightens student's stress levels and produces an adverse effect on performance.**

The only time this method should be used is with a first time skier group while still in the beginner area. Although, with this group, the most productive learning happens if you allow the group to go up and down as many times as they can while you stand at the bottom offering appropriate feedback when necessary.

If it is necessary to use the 'call down' method, you can prevent the students from standing too much by having the next one start when the first one is about half way down.

Whole Group

You can analyse each student as they ski down and give them feedback after the whole group has skied down. You can either stand at the bottom, at the top (point out a place to ski to), or halfway down.

This method will test your analysing skills but do not be overwhelmed, as you will become accomplished at it with practise. For larger groups it is a good idea to give each student a word to remember as they ski to you. This can be used to remind you what feedback to give them when the whole group has gathered. For example, you can tell them to repeat the word 'ankles'. When they repeat this back to you it will jog your memory about closing their ankles and keeping their shins connected with the front of the ski boots.

Skiing in pairs

Students can give feedback to each other and become more involved in the lesson. It's good for building rapport. You must make it very clear to the students what they are looking for and make the task simple.

Focus on one student at a time

You can send the group down to a specific spot to practise their own skiing while you focus on one or two of them. Keep rotating the student(s) that you focus on. This is a good way to give each student extra attention and will speed up the learning process. Often the extra individual attention will produce a breakthrough for students.

If there is a short lift available, you can stay on one spot while the students circulate. Give them feedback each time they come by. This is one of the best ways for students to have plenty of productive practise (be careful to use this method on a relatively empty lift). Also, make sure you go back up the lift to show more demonstrations when needed.

Throughout a week of lessons it is important that you make appropriate use of all of these methods to maximise learning and keep the group moving, interested and involved.

2.1.3D WHERE AND HOW YOU STOP

Educate the students to slow down to the side of the group and stop below the group to avoid collisions. Stopping slightly away from the class and then regrouping is a good way to maintain the informal atmosphere in your lesson.

2.1.3E ADDRESSING MIXED ABILITIES

More often than not your group lesson will be comprised of a mixture of abilities. You will have to manage these situations slightly differently as you come across them but as a set of general guidelines, the following is important:

- **Continue to constantly check your students' goals and motivation for learning.**
- **Keep the whole group involved as this increases the likelihood of learning.**
- **Within a controlled environment you may have to adjust the way the group skis down, allow the more advanced to practise either more often or with slightly harder exercises.**
- **For a children's class remember to keep it interesting/fun to avoid boredom.**
- **Most importantly, for the sake of safety, you must teach and ski at the ability of the slowest in the group, not the most advanced.**

CHAPTER TWO: Teaching Concepts

SECTION TWO:

TEACHING TOOLS

2.2.1 TEACHING TACTICS

Teaching tactics are crucial to successful learning. While they are mentioned throughout the Nine Lesson Essentials and the progressions, some additional information will assist you in the correct use of these tactics to help personalise the learning experience.

2.2.1A CHOICE OF TERRAIN

Choosing the correct terrain is one of the greatest teaching tools we have at our disposal. Terrain can determine whether a particular turn or exercise is even achievable. Resorts in Australia have many designated forms of terrain, for example:

Children's areas: Which are often set aside for children's classes only and can be off-limits to the general public. These areas will often include a kid's specific lift and themes or characters to help animate the space.

SLOW ZONE **First timer or beginner areas:** Are often near the meeting place for lessons with appropriately flat or bowl shaped terrain for introducing guests to the sport. The most appropriate beginner terrain is also in a roped off area to limit traffic.

Green runs: Long, wide, open green runs are useful teaching tools. It is the most suitable terrain for progressing students quickly, from a strong snowplough turn all the way to the basic parallel turn. Flatter terrain with more speed is the best way to promote matching and simultaneous turning, while green terrain is also extremely well suited to all the railing and carving exercises for advanced skiers.

Blue runs: This terrain is ideal for developing intermediate skills and exposing riders to more speed and varied terrain.

Black runs: Are steep runs designed for advanced/experienced skiers. Black runs can be groomed although un-groomed snow conditions are more common. Be careful not to progress students too quickly to steep, black terrain as it can create fear and bad habits.

Double black runs: Are rare in Australia, but do exist. These runs are for experts only and are extremely steep with variable snow conditions.

Freestyle parks, slope style and half pipe: Resorts now cater for a variety of guests' ability levels, ranging from small introductory freestyle parks and pipe to introduce riders to the basic fundamentals. All the way through to world-class jumps and features that experienced and professional athletes can use.

Race courses: Are generally closed to the public and set up for race events and training sessions.

Cat tracks: Link the runs and mountain together. As they are often flat and narrow which makes them dangerous to stop your class's on to teach. They can however, be useful for practising a movement while in transit to the next run.

VARIATIONS IN TERRAIN AND TERRAIN BASED LEARNING

The mountains' terrain is constantly changing and evolving as the season progresses due to the snow pack. There are many areas of the mountain that aid in teaching and can even be artificially produced to help with different teaching outcomes.

New skill old terrain, Old skill new terrain

Groomed: Perfect terrain for first timers through to advanced riders to work on skill development. When the trail is flat with no external obstacles to worry about the learner can focus 100 percent on the task-at-hand and changing their skiing.

Off-piste: A European term for un-groomed runs, the snow conditions are often uneven and variable. Great for strengthening intermediate to advanced skills and exploring what the mountain has to offer.

Banks: Often to the side of runs, they offer a great opportunity for skiers to work on skills that are difficult to feel on a flat groomed run. For example, the weight transfer can be assisted by the bank pushing into the new outside ski. Riding a bank like a wave can also be a fun sensation for skiers vastly different to that of a flat groomed run.

Banked Turns: Machine-made banked turns, for beginner guests, help with learning turns. The banked turns help re-direct a gliding snowplough around smooth turns without any effort from the skier.

Concave: Shaped like an empty bowl can give the skier a feeling of increased speed when ridding down into the bowl.

Convex: Simply a high point, like a large bump, roll or knoll allows the skis to pivot easily on top helping the initiation phase of parallel turns.

Hitting a bump at speed (like a Skier-X course) can also make you feel light for a moment as you lose contact with the snow, effectively un-weighting the skis (removing the force that is reacting between the skis and the snow).

Knolls/rollers and magic moguls: Can be used to reduce friction under the skis making then easier to turn, a first jump for beginners to learn on or timing for pressure control movements like absorption.

Mini Pipe/Perfect Slope: Gentle banking along the sides of a beginner run can help first time skiers start to link turns. The gravity feed pipe means no fear of the skis heading off the trail, so beginners can relax and let their skis meander from side to side.

Moguls or undulating terrain: Speed is the determining factor when it comes to maintaining balance in a mogul field. At slower speeds simply maintaining a good stance with subtle movements fore and aft will help. But as the speed increases the mechanics will need to be replaced with active retraction/extension movements.

Return Wall: Return walls and counter slopes are imperative for beginners to learn the sensation of sliding without the intimidation of getting out of control. The return wall enables a beginning skier to experience the exhilaration of sliding and "skiing" before having to learn how to stop.

Choosing the correct terrain for teaching has a huge impact on a guest's learning experience. Learning a new technique on terrain that is too steep is a disaster. Students will regress faster than you can ski down the run. However, taking students to steeper terrain and then back to easier terrain can help consolidate the technique, but only if the particular turn is already reasonably strong. Be careful, as it is better to increase the steepness in small increments.

A simple way to remember the correct terrain is:

- **New skill old terrain**
- **Old skill new terrain**

2.2.1B SPEED

There is an optimum speed for every turn. For example, moving too slowly when teaching a parallel turn (a very common mistake made by instructors) will result in a stem. Too fast and stemming will again occur because the student is uncomfortable and wants to slow down.

You must understand what the correct speed is for every turn. If you are struggling with the turn when demonstrating or leading the class downhill, you could conclude that the speed is incorrect.

2.2.1C SNOW CONDITIONS

Snow conditions have a huge impact on the way the students ski on any given day. Guest's skis are rarely in great condition and icy slopes tend to bring the students back a level or two.

Ideal snow conditions (groomed, dry, packed powder) are obviously the best and give students the most confidence to learn and progress. Slushy conditions affect the lower levels as they do not have the ability to ski fast enough through the slush to make turning easier and these people tire easily.

If it is icy, remain on gentler terrain. If it is extremely slushy, choose slightly steeper terrain (regardless of the level) to make it easier to move and turn. Be careful that you choose the correct steepness for the students' ability.

More difficult snow conditions can be an enjoyable challenge and bring about deeper learning. For example, even a snowplough turning group can be taken through 10 centimetres of powder on or beside the groomed run. It's a lovely sensation, a thrill, and teaches them to turn strongly with their legs.

2.2.1D TEACHER ASSISTANCE

Teacher assistance can be extremely helpful. It may be the only way for some, less athletic students, to learn and a faster way for others. Certain types of equipment can be used to assist your guest such as a slalom pole/bamboo pole for a skier who is visually impaired to hold onto or even for someone who has trouble turning to one side.

Teacher assistance has many forms, as shown in these photographs.

Teaching leg turning

Assisting side-by-side

Teacher holds plough position

Teacher leads with poles

2.2.1E TEACHING AIDS

Equipment can be used to aid the instructor for many different people from children, to skiers with a disability, to a timid private student. Always be aware of safety of both your class participants and other people on the slope when using specific equipment. Some types of equipment that may be used include:

Equipment	Description and Use
Balloons	Decorating an area, catching games, place between legs, hold in front.
Cones	Build an obstacle course, mark out an area.
Cordial / Food Dye	Mark out an area, draw a track, show a line in moguls.
Frisbees / Plates	Use as a steering wheel, playing, catching, mark out a racecourse.
Hula Hoops	As support for the skier (instructor skis backwards, both holding the hoop).
Edgie Wedgie or 'Wedgease'	Can be used for 3-6yrs olds to help train the muscles to make a snowplough.
Race Poles/Bamboo	To aid balance and control when leading a guest down the slopes.
Terrain Gardens	To improve balance and encourage turning.
Ropes	To improve coordination, good technical program aid in variation to exercises using poles.
Stubbies or Brushes	Good for race training to improve coordination, line or as markers. Safer option as they are made out of soft material

2.2.1F FOLLOWING THE INSTRUCTOR

Following the instructor's track is very helpful to gain a feeling for making round turns and how much/little to finish the turn on any given steepness of slope.
Instructor's tip: Have the student guide or draw their ski tips on the track you leave behind as they follow you.

Shadowing the instructor is great for copying the instructor's movements and gaining a feeling for the rhythm and timing of a given turn. It is astounding how much students pick up subconsciously from copying your movements.

Following the instructor can also be a good way of coaxing a student down a slope that frightens them because you are able to pick the easiest line. Keep them focusing on your body, not looking down the hill and before they know it they are in their comfort zone again.

2.2.1G VIDEO

Video usage is one of the best learning tools for our students and is more readily available in recent times with the advent of camera phones. If you are serious about the profession it is an excellent idea to buy a mini digital camera yourself. The quality is superb and you can watch it straight away on the hill or chairlift.

Smart phones also have effective video cameras and applications for aiding in skier analysis. They are great for correcting movements straight away and you can send the guest their footage/pictures instantly for an added professional experience from the lesson.

Here are some important points to remember when conducting video sessions:

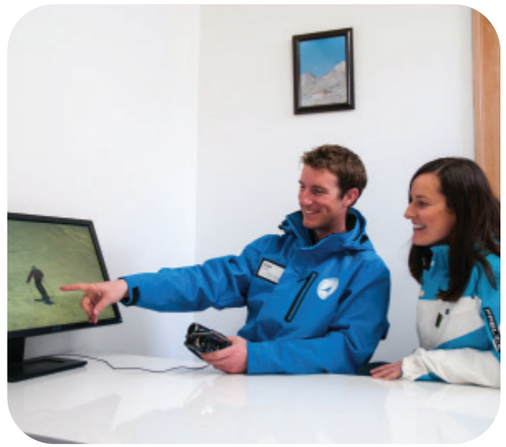
- **Hold the video with both hands and as close to your body as possible to keep it steady.**
- **Keep the subject fairly large in the frame, about two thirds of the screen.**
- **If you are filming from far away, use maximum zoom until the subject has come much closer.**
- **Move the zoom in and out slowly.**
- **Be careful to refrain from making derogatory remarks while filming the students because the microphone picks up everything!**

The students first reaction (if they have never seen themselves skiing) may be, "yuk - that looks horrible." Be careful to first reinforce some positive points about their skiing (if there are not too many positives, avoid the video for the moment) and then show them what can be improved.

Watch the video as soon as possible after the performance and ski again as soon as possible after watching. Help the students associate feelings with the picture. We know ourselves how different it can look compared to what we feel and think we look like. The slow motion and frame-by-frame feature is very useful for analysing skiing.

Where possible change the viewing point by filming from behind (watch hips), in front and the side (fore/aft stance).

Watching the video on a bigger screen like TV or projector can have a much greater impact on change with the student. If you are watching on a TV you can use a white board marker to draw angles and emphasise position. Watching it at full speed should always be a part of the feedback. This is how their brains will remember their performance of the task, instead of in segments/frames.



2.2.2 TEACHING STYLES

Instructors often make the mistake of using the one teaching style that they are most comfortable with. They fail to understand the need to vary this style to suit each student's learning preference and to keep the lesson interesting and exciting. This mistake can often manifest by teaching in a style that they were taught in themselves.

Try to vary the teaching style you use to help you personalise the learning experience by finding the style or mix of styles that each of your guests prefer.

The following are some teaching styles frequently used in snow sport lessons:

Teaching styles

- **Command**
- **Guided Discovery**
- **Problem Solving**
- **Task**
- **Reciprocal**

2.2.2A COMMAND

Explaining a new learning segment to the group is often done in the command style. This does not mean that you line students up and scream commands at them. It means that you are the main focus of the group while you explain and demonstrate the learning segment to the students. Command style is also necessary when safety is an issue e.g. when explaining the Alpine Responsibility Code or when you must decide if terrain and snow conditions are safe for your group or where to ski if the visibility is terrible.

2.2.2B TASK

In the task style of teaching, you take more of a backseat approach and observe the students perform the task that you give them. The student will experiment to achieve the task as you might not tell them specifically "how" to perform it. For example, you might say to either an individual or the group:

- **"Try to alternate five times between parallel and snowplough on the way down this slope"**
- **"Make 15 short turns in the distance from here to the sign"**
- **"Practise your short turns all the way down the run"**
- **"Try to feel your shins against the tongues of the boots as you make turns to the bottom"**

2.2.2C GUIDED DISCOVERY

Students tend to learn fastest when they are given the freedom to experiment with all sorts of different feelings in skiing. For example:

- **"Have several attempts at the snowplough turn to the left, keeping the turning ski flatter rather than railing. Tell me what you felt you had to do to achieve this"**
- **"I want you to try and get the turning ski gripping from the top of the turn, rather than the middle of the turn. Make turns all the way to the bottom of the slope and tell me if you felt you were able to achieve this"**
- **"Make some parallel turns with little speed then with more speed and then tell me which feels easier"**
- **"How do you feel when the ski is gripping or sliding?"**
- **"Make some turns leaning back, leaning forward and then in the middle. Which feels better?"**

Guided discovery, when managed properly, is a great way to teach the students how to learn (i.e. teach themselves). Remember that learning only happens when the individual becomes aware of their movements; therefore guided discovery on its own is not enough.

2.2.2D RECIPROCAL

Reciprocal teaching involves pairing the students up, one as the performer and the other as the analyser and then swapping roles.

Reciprocal teaching is great for:

- **Promoting group interaction.**
- **Getting away from the "I'm the boss and I run the show" scenario.**
- **Helping students become actively involved in the learning process.**
- **Promoting a sharing of feelings and ideas to benefit everybody in the group.**

Having your explanations paraphrased by students may also give a student clearer insight. Make sure that the skill or exercise is simple and well understood by everybody. Carefully monitor the feedback they give each other to make sure it is accurate.

2.2.2E PROBLEM SOLVING

Problem solving is a style of teaching where the instructor gives the student an exercise, either with or without giving a reason to start with. The value in using this method comes from the experimentation and repetition that is needed to produce change.

2.2.3 TEACHING METHODS

How much information is put forward at once can be varied during your classes to keep the learner engaged. When teaching complex skills or tasks try varying your method to address different learners/thinkers.

- **Whole instruction method**
- **Part instruction method**

2.2.3A WHOLE INSTRUCTION METHOD

The 'whole instruction' method involves presenting the task all at once. In general, the student should first be given a chance to attempt the task as a whole. This will allow the student to display their perception of what needs to be learnt. The instructor should observe the learning process noting the movement patterns, timing, coordination, attitude, terrain choice and speed before moving on.

2.2.3B PART INSTRUCTION METHOD

'Part instruction' is where the movement is broken down into smaller parts. These parts are taught individually then added into the whole turn. For example, snowplough turns are taught by first teaching leg turning, and then balancing over the ski. Finally, the parts are added together to make a completed turn.

In most cases it is a combination of teaching styles and both part/whole methods that will best suit most learners. The key is to experiment with different styles and note how your guest learns best. Try mixing it up by adding a little of each style to your descriptions. For example, you can say:

"Watch this turn. Now what I did was rise up first, then turn my legs. I felt light for an instant when I was tall and this allowed me to start guiding my skis easily because I made a re-centering movement. Now Jim, I would like you to follow me. Come on, let's all have a go of that part and we will put it into the whole turn later."

CHAPTER TWO: Teaching Concepts

SECTION THREE:

TEACHING DIFFERENT LEARNERS

2.3.1 LEARNING STYLES

One of the most common and widely-used categorisations of learning styles is Fleming's VARK model

1. **Visual learners**
2. **Auditory learners**
3. **Reading/writing-preference learners**
4. **Kinesthetic or tactile learners**

FLEMING CLAIMED THAT:

- **Visual learners have a preference for seeing, thinking in pictures and need visual aids.**
- **Auditory learners best learn through listening, lectures, discussions.**
- **Reading and writing learners prefer text based input/output to learn new concepts, by either reading or taking notes.**
- **Tactile/kinesthetic learners prefer to learn via experience, moving, touching, and doing.**

Not everybody receives and processes information the same way. To complicate things further, some have a preference for one of the four, while others a combination of two or all four. The trick is to find out from your students how they learn, so you can decide how you will teach them.

Why is it so important to be aware of your students' different learning styles?

If you do not understand the whole concept of learning styles, you will find yourself teaching your lessons in your own learning preference. This is all very well for the students who match your learning preference, but what about all the others? They may learn eventually but not effectively.

Teaching a group lesson requires skilful teaching to ensure that everybody has the best chance of grasping the learning experience. At times you will need to address all the different learning preferences en masse. For example, as you present a new learning segment you target all the learning preferences by explaining, drawing in the snow, demonstrating and having a go.

Throughout the lesson you will need to devote time to each individual student. This is when you need to be aware of your students' preferred style so that you can maximise their learning.

How do you find out your students' preferred learning style?

Often the students are not aware of their preferred learning style. A good way is to ask them about a previous lesson (either in skiing/boarding or any other sport such as golf or tennis) that they found beneficial. Other times a trial and error approach will be needed and the learning styles sometimes show themselves through success at different points in your lesson.

Why did they enjoy the lesson and why did they learn so much?

Discussing this usually gives you a clue about their learning preference or at least a way they prefer not to learn. Another clue about students' learning styles can be gained from observing how they react when you introduce a new learning segment. Some will be keen to see a demonstration so that they can copy it; some will want to form a picture in their head from your explanations; and some will try to understand what it should feel like.

Sometimes you just have to ask them straight out, "how do you learn best - by listening to an explanation, watching a demonstration or by feeling the movement?" Confirm their assessment with your own observations.

2.3.2 TEACHING TO SPECIFIC POPULATIONS

CHILDREN

As children are often less aware of the consequences to their actions, safety should be the primary concern when teaching children's lessons.

To increase the prospect of learning, your lessons should be fun and relevant to the child's interest, while an understanding of how children learn developmentally will allow you to adjust your lesson to meet their developmental level rather than chronological age (for more information see ch. 4).

OLDER SKIERS

As people age gracefully they experience physiological changes, including a reduction in work capacity, heart-lung efficiency, endurance, power, strength, agility and coordination.

This may mean that older guests could have less interest in hours of exercise or indeed the perfection of their skiing skill. They may prefer to gain tactics and simple movement patterns to enable them to continue their skiing career for as long as possible. They want to minimise their output while maximising their results.

All adults like to be included in the lesson process and have a wealth of experience that they can draw from (even if it's from other sports). However, there are some important concepts to consider when instructing older skiers:

- **Remember to check if there are any medical, health or injury issues that can affect their ability to ski.**
- **Include longer warm-up and cool-down periods.**
- **Be aware that strength and endurance capabilities slowly decrease with age but can be improved with training.**
- **Lower the intensity of lessons to suit and provide adequate alternatives.**

www.ausport.gov.au/coach 'Coaching older athletes'

GENDER

In this part we explore some differences between male and females at an anatomical and cognitive level, remembering that these attributes can vary between individuals.

'Q' angle (see 3.3.9):

The width of the pelvis can change the appearance of the angle of the knees when viewing how the femur aligns with the lower leg.

The greater hip width of women gives them a slight X shape in the legs. This can have an effect on the ability to roll both skis onto their edges at the same time, achieving good edge grip and transitioning from turn to turn. Cuff alignment and/or custom foot beds can be of benefit.

Males can tend to be less flexible in the pelvis area especially as they age and this can affect their ability to turn the legs independently from the pelvis. Dry land stretching can help to increase mobility in this area.

Bone length and the calf muscle:

The bones of the average woman's leg tend to be shorter than a man's of the same height. A woman's calf muscles are also longer than and attach lower on the leg compared to men. This makes fitting boots a challenge as most boots will generally fit higher up on the lower leg. Female specific boots have a lower cuff length to assist in leverage and comfort.

Center of Mass (CoM) (see 3.4.5a):

The average difference between men and women's centre of mass (CoM) is approximately 2.5cm due to the shorter leg length and larger pelvis. More of a female's body mass is concentrated at the lower portion of their body making their CoM slightly lower.

Cognitive variations

Males are more inclined to want a general overview of a situation and will disengage if stress levels become too high. Often males would rather 'just have a go' and respond favourably to a competitive environment.

Females prefer to be given more detailed information. They are also more likely to remember every part of a stressful event. This can trigger an emotional response that is directly linked to a past experience. Therefore, women tend to appreciate more 'context' in their learning (why, where, how) and value participating in a non-critical and supportive environment.

2.3.3 INTRODUCTION TO COACHING

WHAT IS COACHING?

Recreation or FUN, is the expenditure of time in a manner designed for therapeutic refreshment of one's body or mind.

Sport is an activity that is governed by a set of rules or customs and often engaged in competitively.

With this in mind the majority of instructors are helping guests have a fun experience on a recreational holiday. The moment that a guest wants to participate in an organised event or has a specific goal to meet, the instructor needs to start coaching. This includes coaching activities in Snowsport Schools such as interschools products, masters and seasonal programs.

Coaching an activity that has a set of rules governing it, is not only rewarding for the instructor but it also adds to the overall experience for the guest. Being a good coach takes experience and time; the same could be said about many experienced APSI trainers and top-level instructors. This is because many top instructors not only help their guests have a fun experience on the snow; they also coach them, helping them reach goals and aspirations, both small and large.

QUALITIES AND SKILLS OF A COACH

To keep it simple, a coach should strive to be an 'inclusive coach' and the qualities and skills they should portray are:

- **Patience: recognising that some participants will take longer to develop skills or make progress than others.**
- **Respect: acknowledging difference and treating all participants as equals.**
- **Adaptability: having a flexible approach to coaching and communication that recognises individual differences.**
- **Organisation: recognising the importance of preparation and planning.**
- **Safe practices: ensuring that every session, whether with groups or individuals, is carried out with the participants' safety in mind.**
- **Knowledge: utilising knowledge of training activities and how to modify them in order to maximise the potential of every participant.**

During a usual snowsports lesson, the instructor teaches new skills to their guest, whereas a coach has to train an athlete in preparation for an upcoming event or goal.

This changes the format of the lesson to a 'training session'. All training sessions should include:

- Course inspection/slip (if being used in that session).
- Warm up and stretch.
- A technical or tactical approach to improving performance practised in blocks or sections.
- Followed by combining these sections to simulate competition.
- Maintenance and closure of the course (if being used in that training session. The coach will also have to continually monitor and maintain the course set and safety).
- Cool down.

The length of time and multitude of training sessions can vary from a one-hour pre-booked Interschools private to season-long training programs. Either way, a simple strategy needs to be followed to ensure a positive training effect. This strategy includes five equally important skills that a coach must include in every training session.

1. Organising
2. Analysing
3. Improving Performance
4. Observing
5. Communicating

1. Organising

Is the ability to organise efficient and effective sessions. Organising is based on knowledge and planning (e.g. organising hill space, course equipment, correct athlete equipment and slope preparation).

2. Observing

The coach should be aware of what is happening at all times (e.g. the athlete's arousal level to meet peak performance).

3. Analysing

Coaches are continually evaluating performance. Do not act on just one observation; rather find out if there is a pattern of error. Coaches will also need to perform a self-evaluation as part of their own personal growth.

4. Communicating

The coach's job depends to a large degree on their ability to communicate; not only verbally, but listening and using appropriate non-verbal communication (with athletes, parents, other coaches and officials).

5. Improving performance

Improving performance is the major role of coaches. It can include either a technical or tactical approach both in and out of the course over a short or long period.

To further enhance your understanding of what it takes to be a 'good coach' it is strongly recommended that you participate in a coaching course which starts with The Beginning Coaching General Principles. This is an on-line course to help new coaches improve their understanding of generic principles of coaching and athlete performance that apply to all sports. Available through the Australian Sports Commission (ASC) website: www.ausport.gov.au

CHAPTER TWO: Teaching Concepts

SECTION FOUR:

TEACHING FOR THE INDIVIDUAL

2.4.1 INTRODUCTION TO SPORTS PSYCHOLOGY

The aim of sports psychology is to help athletes reach and maintain what is called "Ideal Performance State" (IPS). This is the optimal state of physiological and psychological arousal for performing at your peak and can be likened to the feeling of being "unbeatable", "in the zone" or "on a roll."

It is our responsibility to apply the techniques of the sports psychologists (people who work in partnership with athletes to help them attain IPS) and create an environment that will help our students and athletes reach IPS when learning to ski at all levels. In striving to achieve IPS, an understanding of the following four points is necessary.

- **Goals**
- **Mental imagery**
- **Arousal control**
- **Concentration**

2.4.1A GOALS

A goal is defined as attaining a specific standard of proficiency on a task; usually within a specified time limit.[20] Setting both short and long-term goals is important to maintain motivation and will facilitate the attainment of success.

Short-term goals help our students see immediate improvements, provide regular experiences of success and also assist in enhancing their motivation. Short-term goals also allow students to remain focused and keep moving towards achieving their long-term goals.[21]

Long-term goals, although distant, specify the achievement of some standard or outcome at some defined stage in time.[22] A simple staircase or ladder analogy can be used to explain the relationship between short and long-term goals. The top of the staircase represents the long-term goal and the lowest stair the student's current ability level. Each step on the staircase represents a series of progressive short-term goals that are increasingly more difficult.[23]

Realistic goals

It's important to set goals that challenge but are achievable.

Set personal goals

The goals must belong to the student. The student is the person who needs to be motivated by the goals and as such they must set the goals and work/strive to achieve them. The instructor's role is to help initiate the goal setting process and assist the student to identify their goals (see Nine Lesson Essentials 2.1.2).

Goals should be positive

Help the student to focus on success by basing their performance goals on positive actions ("let's make 10 short turns") and refrain from setting goals based on what you should not do ("don't make the short turns too long").

Strategies to achieve goals

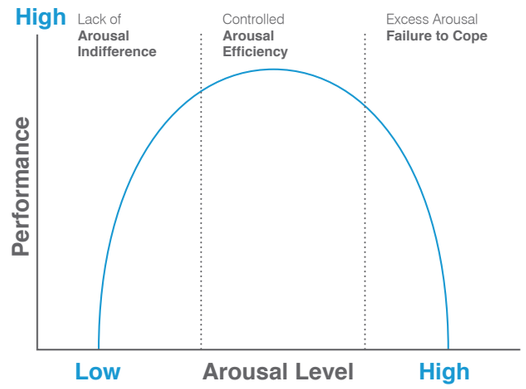
Identify where more effort should be placed. Areas to look at could include fitness, strength, technique, time frames, nutrition or mental skills. Encourage your students to partake in a training or fitness programs a few months (preferably all year round) before their ski holiday. This maximises progress and enjoyment on the slopes while minimising the risk of injury.

Adjust and evaluate goals

Remain flexible with goal evaluation. There are many factors such as snow conditions, size of the group, fitness levels and athleticism of the students that contribute to the need to constantly evaluate and adjust the goals.

2.4.1B AROUSAL CONTROL

Arousal levels impact a skier's ability to perform. The inverted "U" theory shows the relationship between arousal and performance. As the diagram indicates, for peak performance there is an optimal arousal level.[24]



THE INVERTED U RELATIONSHIP[25]

The Inverted U Relationship

Arousal levels that are too low (caused by boredom, fatigue, distractions, lack of interest, lack of challenge) result in a state of lethargy.

Arousal levels that are too high (caused by fear, nervousness, anxiety, frustration) result in slower reaction times, poor coordination, shaking, increased heart rate and tightening of the muscles.[26]

We have considerable control over the arousal levels of our students and it is our responsibility to ensure that they do not drop too low or rise too high. Our students also need to develop an awareness of their body's arousal levels and learn how to apply certain techniques to control these levels.

Techniques to help cope with excess arousal:

Positive Self-Talk: Never think or say "I can't". It is easy to allow negative thoughts to take over and become self-fulfilling prophecies but you need to force yourself to stay positive and see positive outcomes.[27]

Centring: Take a few deep breaths; pause at the top and bottom of the exhaling. Concentrate on tensing then relaxing each muscle by starting at the head and working to the feet. Eventually, with practise, you should be able to gain control over your muscles as well as slow your heart rate.

Key words: Talk yourself through the 'technique' you need to succeed. Use key words that remind you of the actions needed e.g. press then twist ski, instead of long-winded technical thoughts running through your head.

Acting: When negative emotions get the better of you it is easy to let them take control. Professional athletes learn to overpower negative emotions by acting out a positive and confident persona. Even in the face of extreme adversity, acting out a confident persona allows the positive emotions to bring arousal levels back to optimal levels.[28]

[20] *Gould in Williams, 1998 pg183*
[21] *Gould in Williams, 1998 pg187*
[22] *Pyke, 1991 pg168*
[23] *Gould in Williams, 1998 pg187*
[24] *Pyke, 1991 pg188* [25] *Pyke, 1991 pg188*
[28] *Bond, AIS 1988* [27] *James E Loehr, 1994* [28] *James E Loehr, 1994*

2.4.1C MENTAL IMAGERY

Mental imagery, also known as mental rehearsal or visualisation, involves using all the senses to recreate or create an experience in the mind. It is a mental technique that programs the mind and body to respond optimally.[29] It's used to help reach IPS by focusing on performance goals, competition simulation, familiarisation of new ski runs or race courses, arousal control, stress management and boosting confidence levels.

How do you perform mental imagery?

Low arousal levels are a prerequisite to mental imagery. Practise in a quiet environment, for example, before going to sleep or after waking in the morning. Once you are able to master the basic skills you can then practise on the ski hill. Other senses can be included in your imagery practise. There is research to suggest that playing music as you rehearse or imagine the sound of waves at the beach, if this is a pleasant image, can have a positive impact on motor performance and perception of movements. This type of rehearsal is known as a type of sonification.

- **Vary the perspective of the image and see yourself from different angles; Imagine you are watching yourself, like being on a video. This is known as 'outside – in'.**
- **'Inside – out', from your eyes as you are in motion and you may switch these images throughout the visualisation.**
- **Learn to control the speed of the image. Slow it, freeze it and replay it.**
- **Repeat the image until you see yourself performing the task correctly. If you make a mistake rewind it and play it over again until a positive image is developed.**
- **Develop a zoom image. Focus in on the problem area in your run and adjust the image.**[30]
- **The final image should be in "real time."**
- **Visual images are the prominent but not the only form of mental imagery. By involving our other senses such as sound we can enhance the vividness of the image. Imagine the smell, the feel, how long the pressure is held, how the wind tastes, etc.**

[29] *Vealy and Greenlead in Williams 1998, Page 238* [30] *Bond, AIS 1988*

2.4.1D CONCENTRATION

Concentration is about paying attention to what you are doing and what is going on.[31] **It refers to the way you focus your thoughts on a given sport or activity and is crucial for achieving IPS.**

Focus

Successful concentration requires a person to control the width of their focus, which can range from a broad focus to a narrow focus.[32]

Narrow focus involves concentrating on the immediate, relevant aspects of a task and all other thoughts are closed out. Mistakes may occur if the concentration remains in narrow focus for the whole performance. For example, if you only focus on absorption in the moguls you may find yourself losing speed control at times.

Broad focus involves concentrating on all aspects of the task. You are seeing the big picture rather than just a smaller part. Mistakes are again made if your focus remains too broad for the whole performance.[33] Some sport situations require a narrow focus, others broad and some both at the same time. Introverts tend to have a 'narrow' focus and extroverts a 'broad focus'.[34]

Body awareness

World-class athletes have a complete understanding of what their body is feeling, how it moves and the positions of the body parts. Our students may not be world-class athletes but we need to help them become aware of their body movements. When first learning a movement or skill, moving a small amount feels like you are moving a huge amount. Encourage the students to exaggerate because only then will they come close to making the correct movements. Video is very helpful in this process.[35]

Smart thought

This involves having a plan or strategy, as well as knowing which techniques to apply and when to apply them. Having an appropriate plan can facilitate concentration.

Psychologists agree that good concentration is also about:

- **Keeping it simple. The brain can only handle so much information before it becomes cluttered.**
- **Performing in the now. Keeping your focus on what needs to occur now is probably the most important of all.**

Instructors and coaches interested in expanding their knowledge in this area should refer to the appendix for further references.

2.4.2 A DEEPER UNDERSTANDING OF HOW PEOPLE LEARN

The learning cycle

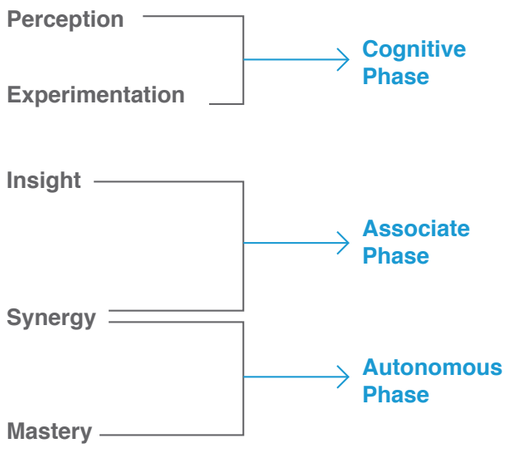
Learning occurs when we become aware of a change in our experience while performing a skill. It is a simple statement but one that we need to keep referring back to. Awareness is the key. We need to not only teach the steps but also educate our guests how to learn and what to be aware of, which often starts by recognising what and how we are performing.

It is well documented that learning occurs in sequential steps. Each phase is as important as the next. Understanding these steps and, more importantly, recognising when they occur and when it is time to move on is in itself a skill that most instructors take years to develop. All too often we rattle through the progression without observing whether true learning has occurred or whether our guest has just achieved success by chance. By understanding the learning process we will be better prepared to teach an effective lesson.

In this part of the chapter we will cover many concepts that all give insights into the learning process. It is an art, not a science, and it will be up to you to use what you understand and apply that to create a true learning experience. This part of the chapter in combination with the development chart in 'teaching children' (Ch. 4) will help you observe at what phase a child's learning is at.

[31] *Harris & Harris, 1984 pg77* [32] *Nideffer & Sagal in Williams, 1998 pg267*
[33] *Smart Sports, AIS* [34] *Bond, AIS 1988* [35] *Smart Sports, AIS*

2.4.3 THE LEARNING PHASES



2.4.4 COGNITIVE PHASE

The cognitive phase of learning is concerned with the learner developing an idea, image or concept of the entire skill to be learned. This image is really a patchwork of existing movement experiences, all collected from previous motor programs. This phase of learning includes perception and experimentation.

2.4.4A PERCEPTION

Learning a new skill starts with an idea that inspires. We might see a skill being performed and picture ourselves doing it. Likewise, imagine how that might feel, or at least perceive how we can benefit from performing it that way. That initial vision is very important as it is this picture that starts the learning process. The student recognises the skills involved in parts and tries to associate them with what they already know.

In this part of the cognitive phase the guest will need to understand what is new, why and how to do it.

INSTRUCTOR'S ROLE

At this phase we need to keep it simple. Give clear demonstrations and impart the least amount of technical information to achieve a result.

2.4.4B EXPERIMENTATION

In this part the student will learn by playing and experimenting. It is their turn to test their perception of what has been presented. They need to exaggerate the movements. They should experiment with the degree of effort - do too much, do too little, notice how each differs and how these movements affect ski performance. In order to try different skills they will be forced to move in ways that are not familiar so their comfort levels will be tested.

INSTRUCTOR'S ROLE

Our role turns into a facilitator. Set guidelines such as where to ski, the correct terrain, shape and speed of turn or movements desired. Discuss how much or little to move while keeping feedback to a minimum. Motivate and reassure them to take a risk and discover new sensations. Ensure they understand that experimenting and exaggerating may feel 'funky' or less dynamic before it feels better.

They may lose balance or fall over before they find out how far they can go. We need to check for understanding, so let them discuss what they discovered and share this with the others in the group. This will engender a team psyche and they will be encouraged to help each other, redefine the focus and experiment again.

2.4.5 ASSOCIATE PHASE

This phase of learning is concerned with making the skill more fluent (though not yet automatic), as well as executing the correct movement in the right order. This phase uses insight and starts to deal with synergy.

Errors of movement may involve such things as the wrong sequence to the parts of the movement (trying to match the inside ski before the edge has changed), the occurrence of inappropriate movements in a sequence (leaning back at the end of the turn), or the wrong timing of the various movements in a sequence (up and down movement in a turn).

2.4.5A INSIGHT

Here the student starts to link or make connections. They will associate the movements made with how the skis perform. You could say this is where light bulb moments occur. Their skills are not refined so they will need to practise the skill in parts.

INSTRUCTOR'S ROLE

The key here is to loop back and forth from the experimental phase, discuss what has been discovered and give more accurate feedback. Set new parameters of what is desired.

Ski behind the guest and talk to them as they ski e.g. yes, good turn, no, yes, more edge, etc. Vary who leads and let them make the decisions as to the speed, radius and terrain. They need to be more in control of the process. You are helping them to make informed decisions and increase their independence and confidence as skiers. Isolate a part of the movement and practise only that. Once that part can be performed then add that to the whole movement. Use of video as feedback for the skier can be invaluable at this stage.

2.4.5B SYNERGY

This is where the movements become more natural and better coordination is shown. The skill can now be performed in differing snow conditions and steeper terrain. Although performance is not without thought, the skill is more comfortable.

Self-analysis also becomes a dominant form of feedback. Sadly, some skiers will never progress past this stage.

INSTRUCTOR'S ROLE

Teach not only parts but also whole movements. Work on the refinement of movements, timing and coordination. Change the task, not the goal (try different exercises) and vary the terrain and snow conditions. There should be repetition of similar movements working towards patterning. Lots of questioning can help the skier work towards an accurate self-analysis (how did that feel? etc.).

2.4.6 AUTONOMOUS PHASE

The autonomous phase of learning is characterised by performance that becomes largely automatic and independent of the normal attention demands that accompany any motor performance. One problem an instructor faces is when a student has reached this stage of learning but their technique is flawed. We have all seen students who have skied the same old mistakes for years. To correct their technique, the skier will have to regress to the associate phase of learning and spend time feeling less comfortable before a change can be made, thus the autonomous phase includes some synergy and mastery.

2.4.6A MASTERY

Movements are now automatic i.e. they are performed instinctively. Once this level is achieved it is possible to concentrate on different tactics without concentrating on technique e.g. change a particular line through a mogul field.

INSTRUCTOR'S ROLE

Lots of mileage is needed. Push the speed, steepness and test out their comfort zone in varying snow conditions. All the practise has been done and now it is time to perform.

Sports psychology comes into play. Teach your guest some tactics e.g. the student can perform good short turns so they can now learn to look for a good line in the bumps or trees. The skills have been so well trained that they can now concentrate on other things.

2.4.7 HOW LONG TO SPEND ON EACH PHASE?

To teach well, instructors need to have a good understanding of these learning phases. Utilising the information under 'instructor's role' outlined above will help. However, it is also important to note that there are other factors that the instructor needs to be aware of when moving through the learning phases, as these will greatly affect how much time is spent at each phase.

These factors include:

- **Arousal**
- **Mental practise**
- **Motivation**
- **Types of feedback**
- **Knowledge of performance (KP)**
- **Knowledge of results (KR)**
- **Using internal and external cues**

Remember, each individual learning experience will be influenced by these factors and people deal with each factor differently. This will greatly determine how much time is spent at each phase.

2.4.7A AROUSAL

Arousal refers to the state of the central nervous system as it receives and processes information. The arousal level of an individual varies from a very low point during deep sleep to very high levels associated with extreme excitement or anxiety.

For most activities the optimal state of arousal needs to be of moderate intensity to guarantee maximum performance. The teaching segment, task or exercise that an instructor presents must be challenging enough to be interesting but not so difficult as to cause frustration and added stress.

Research has shown that heightened arousal or stress levels can also have a negative impact on decision making which could lead to unsafe situations. The data shows that higher cortisol levels (stress) in males can lead to greater risk taking behaviors resulting in a decrease in performance. Interestingly, a slightly elevated stress level for females resulted in an increase in performance, though a high level produced the same decreased performance as men.

2.4.7B MENTAL PRACTISE

Mental practise can be defined as improvement brought about by thinking about a skill or watching someone else perform it.

To study the effectiveness of mental practise, three subject groups are normally used. All three groups are first tested on the movement to be learned. One group then physically practises the skill, the second group either watches someone else perform the skill or just thinks about it and the third group does nothing.

These three groups are then retested on the skill and scores are compared to their original test to see how much improvement took place. Although physical practise produces the best improvement, a combination of less physical practise and more mental practise produces improvements that are almost as great.

It is important to note that it is productive to have your students rehearse the movements before their turn. Mental practise is more effective if the learner has prior experience with the task. Research studies have also suggested that complex skill acquisition is enhanced if observation/imagery of the perfect task is performed just before going to sleep.

2.4.7C MOTIVATION

Motivation refers to an inner drive, emotion or desire that causes a person to do something.

The primary force is a physical and psychological need to remain safe and healthy. The need to be accepted by others, especially their peers, is a great motivator. In particular, athletes are driven by the challenge to learn and display their new skills.

As a teacher we can motivate through pep talks, rewards or punishments, but these techniques have little long-term success. To truly motivate we need to create a safe and fun environment where challenges not only excite but are also achievable. Here the student is not only rewarded by the praise of others but motivation is derived from within.

2.4.7D TYPES OF FEEDBACK

Feedback refers to the information a person receives about the performance of a skill, either while they are performing it or after the skill is completed. Feedback can come from an external source (instructor or fellow student) or from an internal source (Visual, Auditory or Kinesthetic).

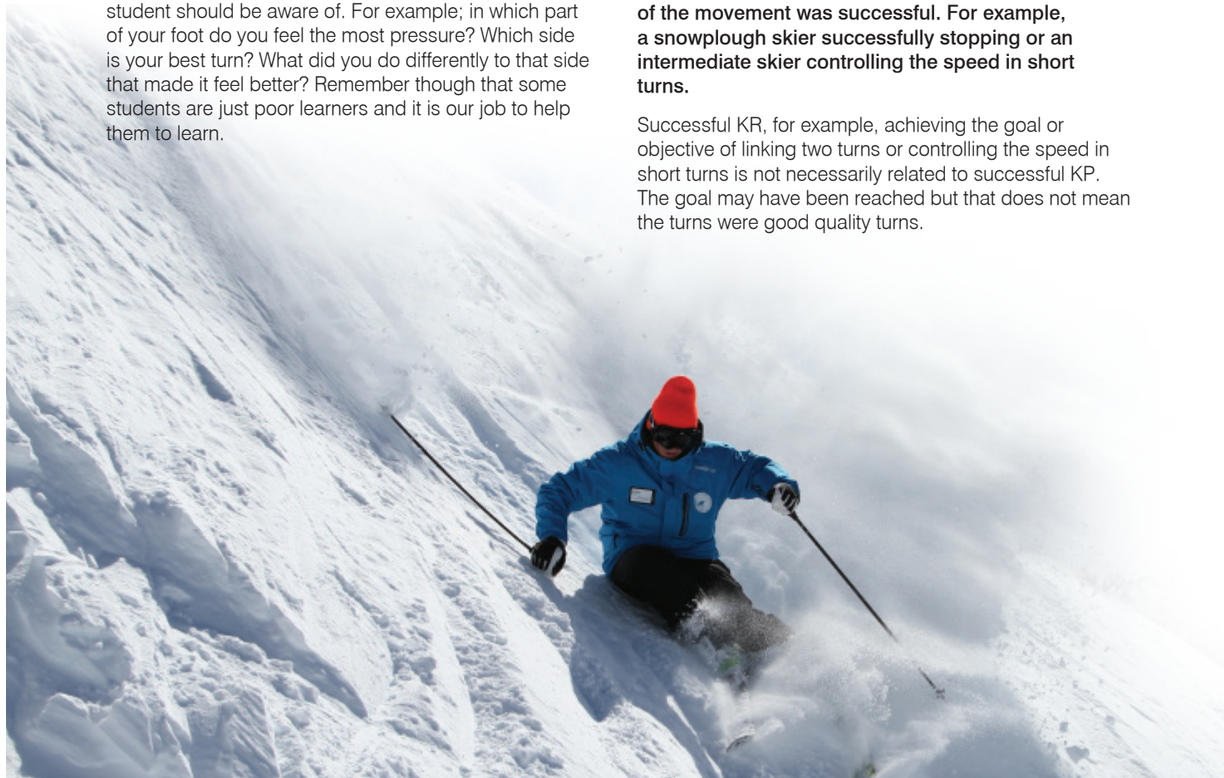
Kinesthetic feedback is information that arises from sensory receptors other than the visual and auditory systems. It represents information that arises from a wide variety of sources such as the receptors of touch, stretch, pressure, balance (the inner ear), joints (detect how straight or bent a joint is) and muscle spindles (detect how quickly and how much the muscle is moved).

2.4.7E AWARENESS OF FEEDBACK

Every individual's sensory system is unique. This means that a certain explanation, demonstration or feeling that works for one student may not work for another. The process of developing the student's awareness requires you to give them several ways to feel and perform the skill or movement.

For example, if the outside ski is too flat in a snowplough turn, there are many ways to explain how to edge the ski more. Ideas include roll the foot, feel the ski bite or grip, feel the ankle against the side of the boot, feel pressure on the inside of the arch, roll the knee, listen to the snow or press the big toe in the snow.

Ask probing questions to narrow in on the area that the student should be aware of. For example; in which part of your foot do you feel the most pressure? Which side is your best turn? What did you do differently to that side that made it feel better? Remember though that some students are just poor learners and it is our job to help them to learn.



2.4.7F KNOWLEDGE OF PERFORMANCE (KP)

Knowledge of performance is the feedback that an individual receives about the actual performance or execution of movement. It is based upon feedback received during the performance of a skill and aids the individual to assess the correctness of their movements.

This type of feedback is stored in memory so that it can be used at a later time for movement evaluation. For example, a student attempts a snowplough turn, consciously rolls the ski on edge while turning but ends up railing and not turning. Next time they try a turn they will remember that this amount of edging prevents turning.

2.4.7G KNOWLEDGE OF RESULTS (KR)

Knowledge of results is the feedback information that an individual uses to assess whether the objective of the movement was successful. For example, a snowplough skier successfully stopping or an intermediate skier controlling the speed in short turns.

Successful KR, for example, achieving the goal or objective of linking two turns or controlling the speed in short turns is not necessarily related to successful KP. The goal may have been reached but that does not mean the turns were good quality turns.

2.4.8 USING INTERNAL AND EXTERNAL CUES

When a skier is focusing on a new skill or reinforcing an old one they have two ways of doing this. Internal focus and external focus.

Internal Focus is to concentrate on a specific body part in movement. For example; rotate your leg in the hip socket, flex your hip or move your hips laterally at the top of the turn.

External focus is to concentrate on the outcome of the movement. For example; unscrew a jar lid with the sole of your foot, leave a 30cm track in the snow, feel like a rope around your waist is pulling your hips back or spray snow back up the hill.

Can you relate to these two types of cues? Which one do you use most for clients? Do you use internal or external cues for yourself in training?

Recent research on a ski simulator has evidence that an external focus of attention is more effective than an internal focus. This highlights that focusing on the relationship your body has with the environment is very important in learning a skill. Focus on the outcome rather than the movement itself.

We can do our own test with a jump using an internal and external cue. First, think of flexing all your joints getting ready to jump. Then think about extending through the ankles, knees and hips to jump. Then, get a friend to hold a $50 note up high and try to jump as high as you can to reach it. Note the difference in height between the two.

Second test. Hold your arm out in front of you. Keeping your arm muscles strong and engaged get a friend to try and push your arm down. Now hold you arm up again but this time think of a beam of energy coming out of your arm and extending far beyond your hand to a point in the distance. Get your friend to push down again while you focus on the beam of energy.

These tests highlight that focusing on the relationship your body has with the environment is very important in learning a skill. Focus on the outcome rather than the movement itself.

There have been many tests done on skills involving precision, efficiency, endurance and strength. They all point to the conclusion that external cues outperform internal cues. There is even research that shows that internal cues can be detrimental in performace ('the choke'). When we focus on the movement itself it disrupts autonomic motor control processes that regulate coordinated movements. We interupt processes in our body that are designed to do this automatically.

So does this mean we should only be using external cues when teaching?

Skiing is an open sport, meaning that there are many ways to achieve the same outcome. Therefore, focusing on the outcome is very important. However, skiing is also something that does not come naturally to us. Throwing, jumping, running are all built into our system and have been programmed over thousands of years. Carving a turn isn't. You can't just tell a new skier to spray snow out to the side as they may not even realise a ski can do that. So, when learning a new movement or in the early stages of skiing, internal cues are very helpful in becoming aware of what we are doing. An external cue can then be used later to help increase the performance, efficiency and accuracy of the task.

See the example of internal and external cues used to help edging earlier on the following page.

Internal:

Roll your ankles over to gain more edge grip at the start of the turn.

External:

At the start of each turn show the bases of your skis to somebody back up the hill.

SUMMARY

Helping our guests become better learners is what our job is all about. Knowing whether a guest is truly aware of a change in their performance takes years of practise. To become proficient you will need to understand the different phases of learning and be aware of the individual factors that affect how long a guest remains at each phase. You will need to facilitate all of this before true learning can occur.

CHAPTER 2 REVIEW

Teaching concepts

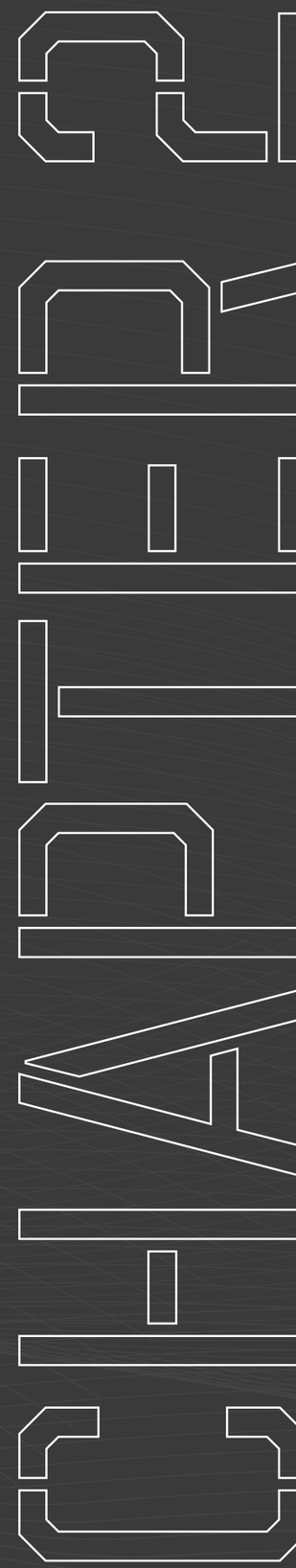
1. Explain: What is meant by experience centred teaching.
2. List the nine essentials.
3. Explain: How you loop through or repeat the nine essentials?
4. Write two clever analogies to explain a snowplough.
5. Why is it always important to explain to your guests what, how and why you are doing something?
6. What are the three points of the movement analysis system?
7. What are some non-skill related reasons for poor ski performance?
8. Feedback needs to be based on which three principles.
9. Give a few reasons why you should not use the one at a time feedback method.
10. What is class handling?
11. What does VARK stand for?
12. How do you find out your students' preferred learning style?
13. What are the five teaching styles?
14. What are the five skills that can help with coaching and give an example of when these skills would come in handy while working in your skis school?
15. What are the three phases of learning?
16. These three phases of learning have five subsections, briefly describe the instructor's role for each of them.
17. Explain: What is Ideal Performance State (IPS)?

TEACHING CONCEPTS

Introduction

ABOUT THIS CHAPTER

Chapter 2, teaching concepts: looks at our philosophy, system for teaching and how you can adjust your lesson to deal with different learners.



CHAPTER TWO: Teaching Concepts

SECTION ONE:

THE TEACHING SYSTEM

2.1.1 THE AUSTRALIAN TEACHING PHILOSOPHY

Australian snowsports instructors should strive to create and sustain a passion for snowsports within their guests. Our goal is to turn first time skiers into long term participants and eventually lifelong enthusiasts.

The core concept underpinning Australia's teaching philosophy involves connecting with the guest to provide a lesson where they walk away wanting more and attain the tools and abilities they need to ski on their own after the lesson. In essence, the philosophy aims to ignite a lasting passion for snowsports.

Some significant teaching philosophies that have underpinned Australian alpine ski instruction over recent years include:

Teacher centred: The teacher is the boss, they decide what should be learnt and how it will be learnt as they are the authority on the subject.

Student centred: The focus of the lesson depends predominantly on the students' goals and wishes and the instructor's role is to fulfil those goals in the best way possible.

Subject centred: Both teacher and student are involved in the learning process without pretence of superiority. The teacher finds out how the student learns and what works best for each student. Both teacher and student have to learn how to move into and within the learning segment by making it a shared learning experience. The teacher continuously watches how the student learns and takes to the subject and how the students are able to help each other with the learning process.

Experience centred: The instructor strives to give the guest an exceptional experience that is all encompassing of the alpine environment. It combines the safe class handling skills and useful exercises learnt from the teacher centred years, the relationship building qualities with customer service taken from the student centred years, combined with the professional, yet relaxed two-way learning atmosphere of the subject centred years.

The more personalised the experience the better the enjoyment, skill improvement and development of passion for snowsports.

The following is an example that highlights what could happen if the instructor does not personalise the experience, interfering with the learning process and inhibiting the chance to convert the guest into long term participants.

Case Study[18]

In 1978 Georges Joubert conducted an experiment to test how effective the French teaching system was.

He selected two groups of students that were closely matched in age, sex, background, etc. Both groups of students had never skied before. One group was given an instructor while the other was not. The only exposure to the sport that the group without an instructor had was the occasional skier that went past on the terrain they were skiing. Both groups skied exactly the same type of terrain and the experiment lasted a whole week.

To start with, the group with an instructor progressed more quickly. However, by the middle of the week the group without an instructor had caught up. By the end of the week the same group was much better than the group with an instructor. They also skied and moved more naturally, while the other group looked rigid and contrived.

How could this be? There are some clear reasons for this outcome. The group with an instructor obviously progressed more quickly to start with, because they were shown how to perform the basic manoeuvres, while the other group had to go through a process of trial and error to figure out how to 'ski'.

Once the group without an instructor had figured it out, they progressed more quickly and bonded more closely. They had a fantastic time laughing, making fun of each other and lost their inhibitions. Everybody had a turn without fear of embarrassment or failure and because the group had bonded they were constantly helping each other. Each time one of the members discovered something they would show the others, sharing the movements and associated feelings.

The entire group experimented with different movements and feelings (including those from related sports) and shared them with everybody. They were constantly watching each other and giving feedback. Each individual developed a higher level of intrinsic feedback, that is, they learned how to critique themselves. The group must have skied and practised at least 10 times more than the other group. The group bonding also allowed for greater interaction and discussion about each other's learning styles.

What is the moral of the story? Are we better off without instructors? Certainly not! We just have to be careful that we refrain from making the following mistakes that the instructor made with his group:

- **He failed to create a fun, relaxed and comfortable learning environment.**
- **His teaching style was more instructor-centred, rather than experience-centred therefore failing to personalise the experience for the guests.**
- **He failed to teach people how to learn (i.e. teach people how to become aware of the changes they experience).**
- **He failed to give his students enough practise and experimenting time to gain a feeling for the learning segment.**[19]

The effectiveness of classic teaching and learning theories will always be challenged. This is the nature of evolution and why the national instructing body (APSI) sends representatives to attend international conferences such as 'Interski'. This becomes a platform for our teaching system to improve by challenging and sharing ideas.

Creating personalised lessons for each guest requires highly developed instructor skills, for example, strong analysis and interpersonal skills and a knowledge of relevant progressions and/or exercises.

The following systems used in this teaching chapter, combined with the other segments in this manual, give you the building blocks to connect with each of your guests and hopefully turn them into lifelong snowsport enthusiasts.

[18] Abraham, 2000 [19] Abraham, 2000

2.1.2 THE AUSTRALIAN SYSTEM FOR TEACHING –'THE NINE LESSON ESSENTIALS'

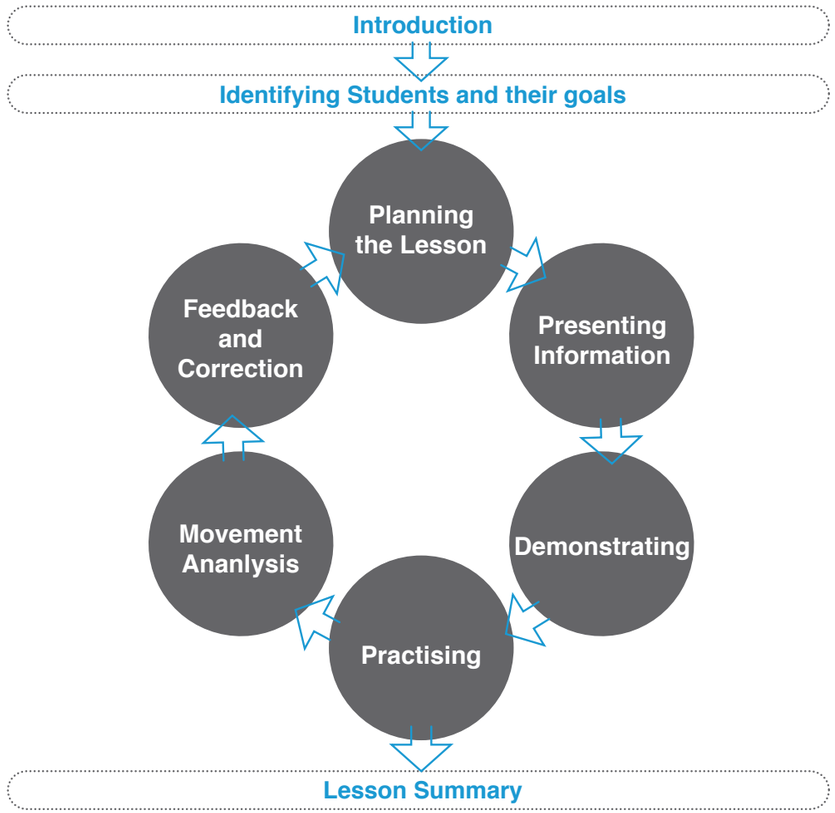
The Nine Lesson Essentials encompass the teaching system that you will use to conduct each lesson. This framework will help structure your lesson from start to finish delivering a professional product with exceptional learning outcomes.

A lesson simply cannot function well without proper application of the Nine Lesson Essentials.

'Looping through' or repeating the nine essentials: It takes considerable expertise to understand how to apply the Nine Lesson Essentials correctly. The 'introduction' and 'summary' are the only points that are covered once during a lesson, while the others are repeated any number of times. You are constantly evaluating the lesson with your students to decide which point to revisit.

It could be point two, to confirm that the students are happy with the lesson so far; three to re-plan the lesson; four to present something new; five to re-demonstrate; six to give them more practise; or seven to analyse their skiing again. Keep looping back and repeating the appropriate points until the time comes to summarise the lesson.

THE NINE LESSON ESSENTIALS:



2.1.2-1 INTRODUCTION

At the start of a lesson, students are often nervous or intimidated (especially if it is their first lesson) and observe you intently to determine your personality. It is essential that you display the skills learnt in 'professionalism' to elicit the students' trust. You should also present yourself in a manner that shows the students that you are human, not some 'snowsport god' who is too cool for their students, so they are comfortable opening up to you. Without trust and confidence in your abilities, a learning partnership cannot be formed and the lesson will not be set up for success.

The following points are covered in the introduction:

- **Introduce yourself in a welcoming manner.**
- **Learn the students' names.**
- **Involve the group by introducing your students to each other.**
- **Deal with the tickets (resort specific).**
- **For a first time lesson, give a lesson overview.**
- **For all other standards, first ask the students what they would like to learn or get out of the lesson. Based on this, you can give a lesson overview.**
- **Generally make them feel welcome.**

2.1.2-2 IDENTIFYING THE STUDENTS AND THEIR GOALS

This involves asking various open questions and using active listening skills to learn as much as possible about your students. You will need to utilise all of your communication skills.

The following can help you to establish an overview of your students:

- **Actively listen to the clients.**
- **Do not presume you know what they want.**
- **Be sympathetic to their goals but realistic.**
- **Check the conditions and client's skill level before you commit.**
- **Discuss a time frame.**
- **Group lessons may require some compromise and therefore some extra planning for the week.**
- **Review the clients' goals throughout the lesson.**

Find out the students' goals: Discovering students' goals is crucial to the success of the lesson. Every student has goals and if you fail to learn about them, the chances of providing a successful, personalised lesson are slim; as are the chances of convincing them to return for more lessons.

Here are some ways you can ask the students about their goals:

- **What do you want to develop or improve?**
- **What would you like to work on today?**
- **What are your goals for the lesson?**
- **What would you like to learn today?**
- **What are you expecting from our time together?**

Once the goals have been established you can decide on an appropriate lesson plan and propose this to the students. If the plan is generally accepted, then the lesson continues. If the plan is not accepted by all, you should revisit the plan until all the students are satisfied. It could be that their goals are not realistic or perhaps they can be met in a subsequent lesson.

A student's goals change throughout each lesson, so check constantly to ensure you are on the right track. Take opportunities such as lift rides (making a point of rotating lift rides with your students), standing in the lift queue or other breaks to ask questions about their goals.

A group lesson is often more challenging than a lesson with one person because you have to deal with ten different people and ten different goals.

Identifying the students: If every student were identical you would use the same teaching approach for all of them. While this is not the case, many instructors make the mistake of applying the same 'standard' lesson every time they teach, with little regard for each individual in the group.

The best teachers find out exactly what type of students they have. Then they draw from their vast knowledge, understanding and experience to construct, together with their students, the most appropriate lesson.

Here is what you should find out about your students throughout the lesson (it may take more than one lesson):

- **Where are they in the scale of athleticism?**
- **What is their fitness level?**
- **Do they take part in skiing related sports such as roller blading, waterskiing or surfing, etc?**
- **Where are they in the scale of aggressiveness?**
- **Are they confident or timid?**
- **Have they ever seen snow before?**
- **How do they learn? You must ask each student how they learn best. If they are unsure, help them become more aware of the learning styles (see 2.6.) This is essential to optimise learning.**
- **How motivated are they to learn? You may need to help motivate them to enjoy the sport.**
- **Have they had lessons before? How many?**
- **What did their last instructor teach them?**
- **What sort of personality are they? Do they like to be pushed? Do they prefer to be gently coaxed along?**

All of these points will greatly influence how you teach and how students learn. If you teach in an area of interest to the student, the likelihood of learning is much greater. As an instructor your task is to find what triggers the student.

It is also important to find out the guests' previous experience to help choose a progression that suits their needs. For a children's lesson you will need to find out their age and adjust your teaching style to make it age specific. If you are teaching a skier who has a disability, you will need to determine the characteristics of their disability and what special needs they may require.

Lift rides provide a good opportuity to engage with and learn about your clients.

2.1.2-3 PLANNING THE LESSON

Having received confirmation from the group that your broad lesson plan is satisfactory, you then go about planning the details of the lesson. The following points should be considered throughout the lesson:

- **What and where is the most suitable terrain?**
- **How are the snow conditions? Icy, un-groomed, slushy, size of moguls?**
- **What is the weather like? Temperature, wind direction, flat light?**
- **Class handling (see 2.1.3).**
- **Professionalism (Ch. 1).**
- **Teaching tactics and teaching styles (see 2.2.1 and 2.2.2).**
- **Learning styles (see 2.3.1).**
- **Age and ability.**
- **What progression and associated exercises to use to help the guest improve (Ch. 5).**

2.1.2-4 PRESENTING INFORMATION

It is a challenge, even an art, to be able to explain skiing in a clear and simple way. An inexperienced instructor easily falls into the trap of making the explanations too complicated, confusing or long-winded. The following key points will help you to deliver good explanations.

Many skiing concepts may be completely foreign to your students. Before they can even hope to attempt a new task, you have to give them a mental image or picture of the learning segment. A demonstration obviously serves this purpose extremely well.

It is always important to explain what, how and why you teach a certain aspect of skiing.

A survey showed that one of the biggest complaints in beginner lessons was that the students had no idea why they were being taught certain exercises or steps.

When explaining a task the best way to create an image is to use clever analogies and the following concepts:

- **Come up with analogies that will appeal to the different students in your group. For example, carving is like a formula one car that grips all the way around the corner or the way a bicycle corners; 'tail swishing' is like a rally car that throws the back out and skids around the corner.**
- **Keep it short and simple (KISS) and avoid talking too much.**
- **You need a thorough understanding of the mechanics of skiing. The more knowledge you have, the more simply you can explain skiing to your students.**
- **Use everyday words to express yourself.**
- **The explanation has to be appropriate for the age group that you are teaching. For example, a three-year-old, teenager or adult.**
- **Spend time rehearsing the explanations to yourself or your fellow instructors to ensure they are clear and concise and cover all the learning styles.**

- **Practise explaining the same concept in many different ways, because not all students comprehend in the same manner.**
- **Technical terms are often convenient to use and fun for the students to learn. Only use technical terms when appropriate and remember to explain to the class what they mean.**
- **Use your poles to draw diagrams in the snow to complement your explanations.**
- **Check to see if your students have understood the explanation by using open questions or by asking them to repeat the critical parts. Look out for students with a confused look.**

2.1.2-5 DEMONSTRATING

Demonstrating is as critical as presenting information because it is key for visual learners (see 2.3.1). To help you give the best possible learning outcome from your demonstrations consider the following:

- **Demonstrate clearly and cleanly so that the students can easily see the task you are asking them to do.**
- **If possible, demonstrate from different angles.**

- **Focus students' attention on the important part of the demonstration. Observing other skiers can also be beneficial to the learner.**
- **When skiing with your students, ski at the correct speed and demonstrate the same turns your group are working on that day.**
- **Practise demos or exercises yourself, as the correct movements are a must for people to learn from.**
- **Demonstrate often. One demonstration for every fourth student is an appropriate amount in a first timer lesson.**

- **Exaggerate when appropriate (correctly and incorrectly), to emphasise part of the technique.**

2.1.2-6 PRACTISING

There are many factors that influence the learning process. It may take numerous attempts before students gain an understanding of the task. After each attempt the level of understanding and feeling improves until there is a breakthrough.

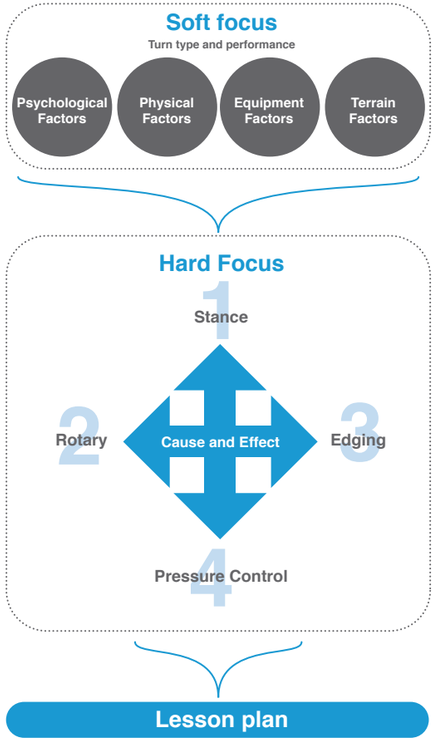
Research shows that the learning process is optimised when students are allowed freedom to experiment with the task and its related movements and feelings. The more ways you can show students how to perform the task, the more success you will have targeting the different learning styles. Allow the group to share their learning experiences with you and the rest of the group as you move through the learning phases.

This is also the time to enhance students' learning with different teaching styles and class handling methods. Ask students to try as many different formations as you can think of - have them pair up, ski behind each other, shadow each other or ski by themselves.

Practise in varied conditions. Studies have shown that deeper learning occurs if a skill is practised in different conditions.

Keep confirming with the group that the balance of teaching and practising is correct. You might be enthralled with what you are teaching, but in actual fact they would much rather be skiing and practising more, or vice versa.

THE MOVEMENT ANALYSIS SYSTEM:



2.1.2-7 MOVEMENT ANALYSIS

Whether in a snowplough turn or a dynamic short turn, skiing is made up of an appropriate blend of the four skills (see 3.1.2). To analyse a skier, you need to have a good understanding of how individual skills are performed, technical concepts and the mechanics of the turn. Understanding the interaction between the skills and how they affect each other, will help you determine a cause and decide on an appropriate solution.

Successful analysis can only happen if you:

- **Have a good understanding of the skiing skills and mechanics.**
- **Understand the movement analysis system.**
- **Possess a clear picture in your head of the correct movements of the turn.**
- **Understand where each turn fits into the performance model (3.2).**
- **Can distinguish the difference between the cause-and-effect of a problem.**

There are several ways to position yourself when analysing students. You can watch from below, from above, from the side, ski behind the student or synchronise with them. Each of these angles gives you a different perspective and can provide you with vital clues about their skiing.

SOFT FOCUS

Watch the first four or so turns to:

- **Determine what turns the student is making to both sides e.g. snowplough or parallel.**
- **Assess the performance the student is making and the general shape of their turn, e.g. 'Z' or 'S' shaped.**
- **Obtain a feeling for the overall attitude of the skier. Ask yourself if there is a non-skill related reason for the way they ski, such as:**

Psychological factors:

- **Fear (many reasons for comfort level)**
- **Age**
- **Unrealistic goals**

Physical factors:

- **Strength**
- **Fitness, fatigue**
- **Previous bad experiences (crashes or injuries)**
- **Disabilities**

Equipment factors:

- **Boots (size? done up properly?)**
- **Ski length**
- **Age of equipment**

Terrain factors:

- **Snow conditions (ice, powder, slush)**
- **Pitch (too steep, too flat)**
- **Convex or concave**
- **Bumps or varied conditions**

HARD FOCUS

After determining the overall attitude of the skier or the 'soft focus', you then need to examine the ski performance, i.e. how the ski moves in comparison to the 'performance model'. Watch to determine how each of the four skills are being performed and how this may help or hinder the desired performance.

Stance: watch to see how the centre of mass (skier weight) is positioned along the skis.

Rotary: watch the legs and upper body to see where the turning force originates from and how it is performed (e.g. smooth or jerky).

Edging: watch the ski performance and angulation (knee, hip and overall inclination).

Pressure control: the skier needs to balance over the outside ski so recheck the angulation (or lack of). Watch for smooth or jerky movements and whether the skier is being thrown around when dealing with terrain or the turn mechanics.

For terrain park features assess the approach, take-off, manoeuvre and landing (ATML).

Approach: The speed and 'line' the skier takes into a feature. Also includes the body's position. An approach can determine which side of a rail feature can be taken or which edge or set up turn is best to take-off a feature.

Take-off: The movements and timing used as the skier leaves the feature. The take-off projects the skier in the desired direction. This includes taking-off with flatter skis for straight airs and features or on an edge for specific manoeuvres and spinning.

Manoeuvre: The movements of the rider in the air or on the feature. A solid approach and take off will aid in the rider's ability to add style to their manoeuvres. Using core strength will aid in all manoeuvres and stabilise the skier during their flight.

Landing: How the rider touches down on the snow. This is the completion of the trick. Landing on top of your skis and being centred is a good feeling.

Finding the cause versus the effect by prioritising areas that need improvement

Always address a soft focus factor first. For example, a guest who has poor stance will never improve their stance if it is caused by fear of steep terrain. Therefore, it is imperative that you take them to easier terrain before attempting to fix their stance.

If all the soft focus factors look okay then decide which hard focus skill needs to be addressed. Assess each of the skills in the correct order to determine if a weakness in one area is preventing the following skills from being effective.

It is also important to examine how each skill interacts with the mechanics of the turn, look at the speed, the overall performance expectation and the timing or rhythm of the movements you are assessing:

- **Work on stance first: if it is poor enough to prevent the other three skills from being performed properly.**
- **Work on rotary skills first: if the stance is okay but the turning force originates from the upper body and the rotation causes hip angulation and edging to be lost.**
- **Work on edging skills first: if the stance is okay but the skis are so flat that the skier has trouble changing direction; or if the other skills are good but the skier is ready to go faster (like in carving where edging should be earlier and stronger).**
- **Work on pressure control skills first: if there is too much weight on the inside ski or if the skier gets thrown around too much (more applicable to upper levels).**
- **Work on ATML: if a manoeuvre is being attempted on a terrain feature.**

2.1.2-8 FEEDBACK AND CORRECTION

FEEDBACK

Feedback is the information received about the performance of a skill, either during or after the skill is completed.

Feedback can be external, from an outside source (e.g. instructor or fellow student), or internal, from the individual's sensory systems. The instructor's aim is to use external feedback to help train and develop the students' internal awareness. This is the only way true learning can occur. In other words, we are teaching them how to become a better learner.

A true learning environment is one where the instructor is not the only 'teacher'. The students are learning from you. Yet, you are also gaining knowledge about how your students learn. Encourage students to share feelings and ideas with each other. Always explain what, how and why you want them to make a change to their skiing.
For example, "I need you to edge the ski a little more **(what)** by pressing down on the big toe side of your foot **(how)**. This will allow you to control the speed more easily **(why)**."

Feedback will have more meaning if the guest understands what they did in the first place. We should strive to help the student become aware of what they were doing and how to correct it. By giving in-depth feedback, the students can reflect and compare what they felt to the instructor's feedback, which helps them develop their own internal feedback.

THE MANNER IN WHICH WE DELIVER THE FEEDBACK SHOULD BE:

- **Positive**
- **Simple**
- **Accurate**

Positive

Always start by giving the students positive feedback about their skiing, followed by advice on how to improve or progress to the next level.

Feedback should never degrade or humiliate but rather help and encourage the students to improve so that they enjoy the sport even more. You will need to allow students time to practise and experiment using carefully selected feedback and lots of encouragement.

Simple

Feedback must be simple. Even the best world cup athletes must have feedback given to them simply if a change is to occur. (KISS- Keep It Short and Simple).

Accurate

Accurate feedback depends on how good your analysis is. If you see exactly what is incorrect you can give accurate feedback. If you are not sure, the feedback becomes vague, incorrect or counterproductive.

CORRECTION

The mistakes need to be prioritised and then worked on one at a time. Refer to point two of the Nine Lesson Essentials (identifying the students) to help decide how to approach the correction. It is crucial that you consider these points (i.e. athleticism, attitude, personality, learning preference, etc.) carefully because they will greatly influence how you correct your student's skiing. The tactics to consider include:

- **Select terrain that is easy for the student.**
- **Appropriate snow conditions.**
- **Use a variety of appropriate exercises or mini-progressions to help correct the skills.**
- **Choose appropriate speed.**
- **Demonstrate clearly.**
- **Make sure their equipment is safe.**
- **Check that they understand your feedback by showing and explaining what is required and how to physically do the correct movements.**

At this point in the lesson it is time to loop back to one of the nine essentials e.g. you may ask your students to 'try it again' (lesson essential six - practise). Next you need to do seven and eight again to see if they understood the task. Loop back through the lesson essentials by going back to any of the other steps (except the introduction) and following the system again. It is an ongoing process until students can do the task or the lesson time is over, at which point you would move onto the summary.

2.1.2-9 LESSON SUMMARY

If you give a good lesson but fail to include a summary, the lesson is far from successful. The following points have to be covered in the lesson summary:

- **Briefly go over everything you covered during the lesson.**
- **Confirm which goals were and were not met.**
- **Provide a plan for a future lesson to cover the goals that were not met.**
- **Discuss all the improvements made.**
- **Repeat the plan for tomorrow or the next lesson.**
- **Give them some things to work on after the lesson and suggest where they should practise.**
- **Invite them to come back for another lesson. Self asses your lesson, a good question to ask the group is: "What will you tell your friends about your trip when you return home?"**

2.1.3 CLASS HANDLING

Class handling is the way you organise and manage the group throughout the lesson. It is a crucial component of the teaching system, vital to the success of the lesson and safety of the group.

It is even more important if the group is larger, has mixed abilities, space is limited or you are teaching children. Poor class handling can result in any or all of the following: bored students, limited actual learning or in the worst case scenario, an accident as safety has been compromised. Educating our students on the "Alpine Responsibility Code" (see 1.2.1) is also an important part of class handling. The elements of class handling are:

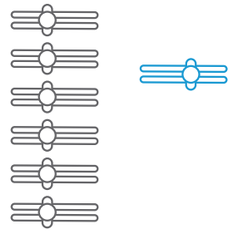
- **The way you line up your class.**
- **The way you ski the group down the hill.**
- **The way you analyse, give feedback and correct the group's skiing.**
- **Where and how you stop.**
- **Addressing mixed abilities.**

2.1.3A THE WAY YOU LINE UP YOUR CLASS

Always try to line the class up with their backs to the wind, snow and if possible, sun.

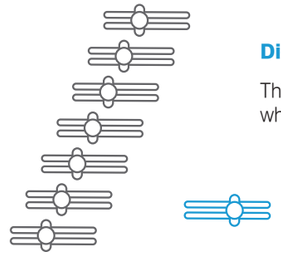
A well-structured and organised approach is particularly important if the resort is busy and terrain limited. This is the best way to conserve space and to keep the area safe. You will rely on your customer service skills and personality to keep the atmosphere relaxed and if possible an informal approach is more desirable.

This informal, less rigid approach creates a relaxed atmosphere where students feel more comfortable interacting with each other and with you. The importance of this cannot be emphasised enough because it is one of the fundamentals of experience centred teaching.



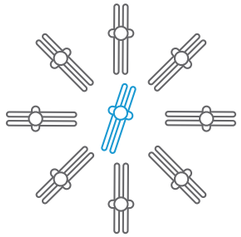
Line up:

This is well structured but is 'dictatorial' and can create a 'you vs. them' feeling. Good option for limited space situations.



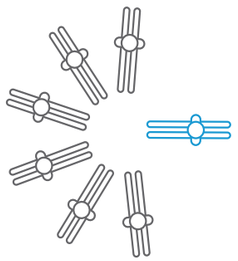
Diagonal Line up:

This helps everyone see when you are doing a demo.



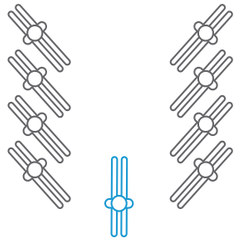
Instructor at the centre of the circle:

Good for beginner groups on the flat, although instructor must be careful to communicate with whole groups.



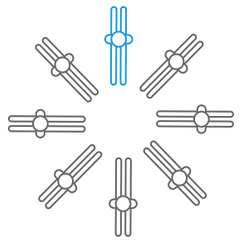
Semi-circle:

More informal. Students all feel like part of the group. Limits vision when moving off.



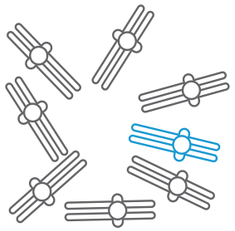
Corridor:

Good for large groups of beginners, especially for straight run exercises.



Instructor included circle:

Informal group feel but instructor is able to have visual and verbal communication with all students.



Huddle:

Informal. Good for advanced students or for a casual atmosphere.

2.1.3B THE WAY YOU SKI THE GROUP DOWN THE HILL

Before skiing off with the group, you must explain which method you are going to use.

The snake

Following the instructor in a snake is useful for the following reasons:

- **To lead the group from one place to another.**
- **To choose the best path down a tricky piece of terrain.**
- **To show the students the correct turn shape for skiing down a steeper run for the first time.**
- **To show the group where to turn e.g. on bumps etc.**
- **To give the students the chance to learn through watching and copying. Remember, only the first person behind you benefits so keep rotating the person following. Keep watching the students behind you so that you can give them feedback. A great way to watch the students is for you to ski backwards (being careful not to run into anyone/ anything) while the group follows in a snake.**
- **Be careful to avoid taking up the whole slope when skiing your group down in a snake. If there is nobody on the slope you can take up more room, however, if it is busy you should stay to the side of the run with your group.**

Skiing down as a group

The students free ski down to concentrate on and practise their own skiing. Designate a place where you will meet again. This will need to be a clearly defined place on the hill when teaching children, not just by saying "ski for 20 metres", as this doesn't make sense to them. To avoid collisions have the students give each other enough space.

This is an excellent way to have students try out a new skill and start developing a feeling for it.

For correct learning to take place, the student has to develop an awareness of their performance and this is achieved through considerable guided practise. If the lesson is mostly analysing and standing around, actual practise is limited and learning will be greatly reduced.

Combination of the above two

You can also mix it up by having one or two students follow you and the rest free ski down on their own. Take turns with this method.

Student leader

One of the students leads the group in a snake while you ski around the group to analyse and give them feedback.

2.1.3C THE WAY YOU ANALYSE, GIVE FEEDBACK AND CORRECT THE GROUP'S SKIING

Call Down

Calling students down one at a time, with lengthy feedback as they come down is obviously very thorough but there are a few reasons why you should not use this method:

- **It is very slow and the students stand around for most of the lesson.**
- **Often there are several students with the same or similar mistakes so you end up explaining the same thing over.**
- **The students who come down later miss out on hearing what you say to the earlier ones and miss learning from each other.**
- **Performing in front of others can create a 'mere presence effect' that heightens student's stress levels and produces an adverse effect on performance.**

The only time this method should be used is with a first time skier group while still in the beginner area. Although, with this group, the most productive learning happens if you allow the group to go up and down as many times as they can while you stand at the bottom offering appropriate feedback when necessary.

If it is necessary to use the 'call down' method, you can prevent the students from standing too much by having the next one start when the first one is about half way down.

Whole Group

You can analyse each student as they ski down and give them feedback after the whole group has skied down. You can either stand at the bottom, at the top (point out a place to ski to), or halfway down.

This method will test your analysing skills but do not be overwhelmed, as you will become accomplished at it with practise. For larger groups it is a good idea to give each student a word to remember as they ski to you. This can be used to remind you what feedback to give them when the whole group has gathered. For example, you can tell them to repeat the word 'ankles'. When they repeat this back to you it will jog your memory about closing their ankles and keeping their shins connected with the front of the ski boots.

Skiing in pairs

Students can give feedback to each other and become more involved in the lesson. It's good for building rapport. You must make it very clear to the students what they are looking for and make the task simple.

Focus on one student at a time

You can send the group down to a specific spot to practise their own skiing while you focus on one or two of them. Keep rotating the student(s) that you focus on. This is a good way to give each student extra attention and will speed up the learning process. Often the extra individual attention will produce a breakthrough for students.

If there is a short lift available, you can stay on one spot while the students circulate. Give them feedback each time they come by. This is one of the best ways for students to have plenty of productive practise (be careful to use this method on a relatively empty lift). Also, make sure you go back up the lift to show more demonstrations when needed.

Throughout a week of lessons it is important that you make appropriate use of all of these methods to maximise learning and keep the group moving, interested and involved.

2.1.3D WHERE AND HOW YOU STOP

Educate the students to slow down to the side of the group and stop below the group to avoid collisions. Stopping slightly away from the class and then regrouping is a good way to maintain the informal atmosphere in your lesson.

2.1.3E ADDRESSING MIXED ABILITIES

More often than not your group lesson will be comprised of a mixture of abilities. You will have to manage these situations slightly differently as you come across them but as a set of general guidelines, the following is important:

- **Continue to constantly check your students' goals and motivation for learning.**
- **Keep the whole group involved as this increases the likelihood of learning.**
- **Within a controlled environment you may have to adjust the way the group skis down, allow the more advanced to practise either more often or with slightly harder exercises.**
- **For a children's class remember to keep it interesting/fun to avoid boredom.**
- **Most importantly, for the sake of safety, you must teach and ski at the ability of the slowest in the group, not the most advanced.**

CHAPTER TWO: Teaching Concepts

SECTION TWO:

TEACHING TOOLS

2.2.1 TEACHING TACTICS

Teaching tactics are crucial to successful learning. While they are mentioned throughout the Nine Lesson Essentials and the progressions, some additional information will assist you in the correct use of these tactics to help personalise the learning experience.

2.2.1A CHOICE OF TERRAIN

Choosing the correct terrain is one of the greatest teaching tools we have at our disposal. Terrain can determine whether a particular turn or exercise is even achievable. Resorts in Australia have many designated forms of terrain, for example:

Children's areas: Which are often set aside for children's classes only and can be off-limits to the general public. These areas will often include a kid's specific lift and themes or characters to help animate the space.

SLOW ZONE **First timer or beginner areas:** Are often near the meeting place for lessons with appropriately flat or bowl shaped terrain for introducing guests to the sport. The most appropriate beginner terrain is also in a roped off area to limit traffic.

Green runs: Long, wide, open green runs are useful teaching tools. It is the most suitable terrain for progressing students quickly, from a strong snowplough turn all the way to the basic parallel turn. Flatter terrain with more speed is the best way to promote matching and simultaneous turning, while green terrain is also extremely well suited to all the railing and carving exercises for advanced skiers.

Blue runs: This terrain is ideal for developing intermediate skills and exposing riders to more speed and varied terrain.

Black runs: Are steep runs designed for advanced/experienced skiers. Black runs can be groomed although un-groomed snow conditions are more common. Be careful not to progress students too quickly to steep, black terrain as it can create fear and bad habits.

Double black runs: Are rare in Australia, but do exist. These runs are for experts only and are extremely steep with variable snow conditions.

Freestyle parks, slope style and half pipe: Resorts now cater for a variety of guests' ability levels, ranging from small introductory freestyle parks and pipe to introduce riders to the basic fundamentals. All the way through to world-class jumps and features that experienced and professional athletes can use.

Race courses: Are generally closed to the public and set up for race events and training sessions.

Cat tracks: Link the runs and mountain together. As they are often flat and narrow which makes them dangerous to stop your class's on to teach. They can however, be useful for practising a movement while in transit to the next run.

VARIATIONS IN TERRAIN AND TERRAIN BASED LEARNING

The mountains' terrain is constantly changing and evolving as the season progresses due to the snow pack. There are many areas of the mountain that aid in teaching and can even be artificially produced to help with different teaching outcomes.

New skill old terrain, Old skill new terrain

Groomed: Perfect terrain for first timers through to advanced riders to work on skill development. When the trail is flat with no external obstacles to worry about the learner can focus 100 percent on the task-at-hand and changing their skiing.

Off-piste: A European term for un-groomed runs, the snow conditions are often uneven and variable. Great for strengthening intermediate to advanced skills and exploring what the mountain has to offer.

Banks: Often to the side of runs, they offer a great opportunity for skiers to work on skills that are difficult to feel on a flat groomed run. For example, the weight transfer can be assisted by the bank pushing into the new outside ski. Riding a bank like a wave can also be a fun sensation for skiers vastly different to that of a flat groomed run.

Banked Turns: Machine-made banked turns, for beginner guests, help with learning turns. The banked turns help re-direct a gliding snowplough around smooth turns without any effort from the skier.

Concave: Shaped like an empty bowl can give the skier a feeling of increased speed when ridding down into the bowl.

Convex: Simply a high point, like a large bump, roll or knoll allows the skis to pivot easily on top helping the initiation phase of parallel turns.

Hitting a bump at speed (like a Skier-X course) can also make you feel light for a moment as you lose contact with the snow, effectively un-weighting the skis (removing the force that is reacting between the skis and the snow).

Knolls/rollers and magic moguls: Can be used to reduce friction under the skis making then easier to turn, a first jump for beginners to learn on or timing for pressure control movements like absorption.

Mini Pipe/Perfect Slope: Gentle banking along the sides of a beginner run can help first time skiers start to link turns. The gravity feed pipe means no fear of the skis heading off the trail, so beginners can relax and let their skis meander from side to side.

Moguls or undulating terrain: Speed is the determining factor when it comes to maintaining balance in a mogul field. At slower speeds simply maintaining a good stance with subtle movements fore and aft will help. But as the speed increases the mechanics will need to be replaced with active retraction/extension movements.

Return Wall: Return walls and counter slopes are imperative for beginners to learn the sensation of sliding without the intimidation of getting out of control. The return wall enables a beginning skier to experience the exhilaration of sliding and "skiing" before having to learn how to stop.

Choosing the correct terrain for teaching has a huge impact on a guest's learning experience. Learning a new technique on terrain that is too steep is a disaster. Students will regress faster than you can ski down the run. However, taking students to steeper terrain and then back to easier terrain can help consolidate the technique, but only if the particular turn is already reasonably strong. Be careful, as it is better to increase the steepness in small increments.

A simple way to remember the correct terrain is:

- **New skill old terrain**
- **Old skill new terrain**

2.2.1B SPEED

There is an optimum speed for every turn. For example, moving too slowly when teaching a parallel turn (a very common mistake made by instructors) will result in a stem. Too fast and stemming will again occur because the student is uncomfortable and wants to slow down.

You must understand what the correct speed is for every turn. If you are struggling with the turn when demonstrating or leading the class downhill, you could conclude that the speed is incorrect.

2.2.1C SNOW CONDITIONS

Snow conditions have a huge impact on the way the students ski on any given day. Guest's skis are rarely in great condition and icy slopes tend to bring the students back a level or two.

Ideal snow conditions (groomed, dry, packed powder) are obviously the best and give students the most confidence to learn and progress. Slushy conditions affect the lower levels as they do not have the ability to ski fast enough through the slush to make turning easier and these people tire easily.

If it is icy, remain on gentler terrain. If it is extremely slushy, choose slightly steeper terrain (regardless of the level) to make it easier to move and turn. Be careful that you choose the correct steepness for the students' ability.

More difficult snow conditions can be an enjoyable challenge and bring about deeper learning. For example, even a snowplough turning group can be taken through 10 centimetres of powder on or beside the groomed run. It's a lovely sensation, a thrill, and teaches them to turn strongly with their legs.

2.2.1D TEACHER ASSISTANCE

Teacher assistance can be extremely helpful. It may be the only way for some, less athletic students, to learn and a faster way for others. Certain types of equipment can be used to assist your guest such as a slalom pole/bamboo pole for a skier who is visually impaired to hold onto or even for someone who has trouble turning to one side.

Teacher assistance has many forms, as shown in these photographs.

Teaching leg turning

Assisting side-by-side

Teacher holds plough position

Teacher leads with poles

2.2.1E TEACHING AIDS

Equipment can be used to aid the instructor for many different people from children, to skiers with a disability, to a timid private student. Always be aware of safety of both your class participants and other people on the slope when using specific equipment. Some types of equipment that may be used include:

Equipment	Description and Use
Balloons	Decorating an area, catching games, place between legs, hold in front.
Cones	Build an obstacle course, mark out an area.
Cordial / Food Dye	Mark out an area, draw a track, show a line in moguls.
Frisbees / Plates	Use as a steering wheel, playing, catching, mark out a racecourse.
Hula Hoops	As support for the skier (instructor skis backwards, both holding the hoop).
Edgie Wedgie or 'Wedgease'	Can be used for 3-6yrs olds to help train the muscles to make a snowplough.
Race Poles/Bamboo	To aid balance and control when leading a guest down the slopes.
Terrain Gardens	To improve balance and encourage turning.
Ropes	To improve coordination, good technical program aid in variation to exercises using poles.
Stubbies or Brushes	Good for race training to improve coordination, line or as markers. Safer option as they are made out of soft material

2.2.1F FOLLOWING THE INSTRUCTOR

Following the instructor's track is very helpful to gain a feeling for making round turns and how much/little to finish the turn on any given steepness of slope.
Instructor's tip: Have the student guide or draw their ski tips on the track you leave behind as they follow you.

Shadowing the instructor is great for copying the instructor's movements and gaining a feeling for the rhythm and timing of a given turn. It is astounding how much students pick up subconsciously from copying your movements.

Following the instructor can also be a good way of coaxing a student down a slope that frightens them because you are able to pick the easiest line. Keep them focusing on your body, not looking down the hill and before they know it they are in their comfort zone again.

2.2.1G VIDEO

Video usage is one of the best learning tools for our students and is more readily available in recent times with the advent of camera phones. If you are serious about the profession it is an excellent idea to buy a mini digital camera yourself. The quality is superb and you can watch it straight away on the hill or chairlift.

Smart phones also have effective video cameras and applications for aiding in skier analysis. They are great for correcting movements straight away and you can send the guest their footage/pictures instantly for an added professional experience from the lesson.

Here are some important points to remember when conducting video sessions:

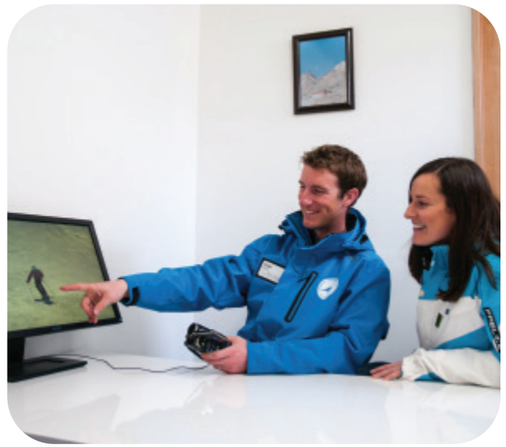
- **Hold the video with both hands and as close to your body as possible to keep it steady.**
- **Keep the subject fairly large in the frame, about two thirds of the screen.**
- **If you are filming from far away, use maximum zoom until the subject has come much closer.**
- **Move the zoom in and out slowly.**
- **Be careful to refrain from making derogatory remarks while filming the students because the microphone picks up everything!**

The students first reaction (if they have never seen themselves skiing) may be, "yuk - that looks horrible." Be careful to first reinforce some positive points about their skiing (if there are not too many positives, avoid the video for the moment) and then show them what can be improved.

Watch the video as soon as possible after the performance and ski again as soon as possible after watching. Help the students associate feelings with the picture. We know ourselves how different it can look compared to what we feel and think we look like. The slow motion and frame-by-frame feature is very useful for analysing skiing.

Where possible change the viewing point by filming from behind (watch hips), in front and the side (fore/aft stance).

Watching the video on a bigger screen like TV or projector can have a much greater impact on change with the student. If you are watching on a TV you can use a white board marker to draw angles and emphasise position. Watching it at full speed should always be a part of the feedback. This is how their brains will remember their performance of the task, instead of in segments/frames.



2.2.2 TEACHING STYLES

Instructors often make the mistake of using the one teaching style that they are most comfortable with. They fail to understand the need to vary this style to suit each student's learning preference and to keep the lesson interesting and exciting. This mistake can often manifest by teaching in a style that they were taught in themselves.

Try to vary the teaching style you use to help you personalise the learning experience by finding the style or mix of styles that each of your guests prefer.

The following are some teaching styles frequently used in snow sport lessons:

Teaching styles

- **Command**
- **Guided Discovery**
- **Problem Solving**
- **Task**
- **Reciprocal**

2.2.2A COMMAND

Explaining a new learning segment to the group is often done in the command style. This does not mean that you line students up and scream commands at them. It means that you are the main focus of the group while you explain and demonstrate the learning segment to the students. Command style is also necessary when safety is an issue e.g. when explaining the Alpine Responsibility Code or when you must decide if terrain and snow conditions are safe for your group or where to ski if the visibility is terrible.

2.2.2B TASK

In the task style of teaching, you take more of a backseat approach and observe the students perform the task that you give them. The student will experiment to achieve the task as you might not tell them specifically "how" to perform it. For example, you might say to either an individual or the group:

- **"Try to alternate five times between parallel and snowplough on the way down this slope"**
- **"Make 15 short turns in the distance from here to the sign"**
- **"Practise your short turns all the way down the run"**
- **"Try to feel your shins against the tongues of the boots as you make turns to the bottom"**

2.2.2C GUIDED DISCOVERY

Students tend to learn fastest when they are given the freedom to experiment with all sorts of different feelings in skiing. For example:

- **"Have several attempts at the snowplough turn to the left, keeping the turning ski flatter rather than railing. Tell me what you felt you had to do to achieve this"**
- **"I want you to try and get the turning ski gripping from the top of the turn, rather than the middle of the turn. Make turns all the way to the bottom of the slope and tell me if you felt you were able to achieve this"**
- **"Make some parallel turns with little speed then with more speed and then tell me which feels easier"**
- **"How do you feel when the ski is gripping or sliding?"**
- **"Make some turns leaning back, leaning forward and then in the middle. Which feels better?"**

Guided discovery, when managed properly, is a great way to teach the students how to learn (i.e. teach themselves). Remember that learning only happens when the individual becomes aware of their movements; therefore guided discovery on its own is not enough.

2.2.2D RECIPROCAL

Reciprocal teaching involves pairing the students up, one as the performer and the other as the analyser and then swapping roles.

Reciprocal teaching is great for:

- **Promoting group interaction.**
- **Getting away from the "I'm the boss and I run the show" scenario.**
- **Helping students become actively involved in the learning process.**
- **Promoting a sharing of feelings and ideas to benefit everybody in the group.**

Having your explanations paraphrased by students may also give a student clearer insight. Make sure that the skill or exercise is simple and well understood by everybody. Carefully monitor the feedback they give each other to make sure it is accurate.

2.2.2E PROBLEM SOLVING

Problem solving is a style of teaching where the instructor gives the student an exercise, either with or without giving a reason to start with. The value in using this method comes from the experimentation and repetition that is needed to produce change.

2.2.3 TEACHING METHODS

How much information is put forward at once can be varied during your classes to keep the learner engaged. When teaching complex skills or tasks try varying your method to address different learners/thinkers.

- **Whole instruction method**
- **Part instruction method**

2.2.3A WHOLE INSTRUCTION METHOD

The 'whole instruction' method involves presenting the task all at once. In general, the student should first be given a chance to attempt the task as a whole. This will allow the student to display their perception of what needs to be learnt. The instructor should observe the learning process noting the movement patterns, timing, coordination, attitude, terrain choice and speed before moving on.

2.2.3B PART INSTRUCTION METHOD

'Part instruction' is where the movement is broken down into smaller parts. These parts are taught individually then added into the whole turn. For example, snowplough turns are taught by first teaching leg turning, and then balancing over the ski. Finally, the parts are added together to make a completed turn.

In most cases it is a combination of teaching styles and both part/whole methods that will best suit most learners. The key is to experiment with different styles and note how your guest learns best. Try mixing it up by adding a little of each style to your descriptions. For example, you can say:

"Watch this turn. Now what I did was rise up first, then turn my legs. I felt light for an instant when I was tall and this allowed me to start guiding my skis easily because I made a re-centering movement. Now Jim, I would like you to follow me. Come on, let's all have a go of that part and we will put it into the whole turn later."

CHAPTER TWO: Teaching Concepts

SECTION THREE:

TEACHING DIFFERENT LEARNERS

2.3.1 LEARNING STYLES

One of the most common and widely-used categorisations of learning styles is Fleming's VARK model

1. **Visual learners**
2. **Auditory learners**
3. **Reading/writing-preference learners**
4. **Kinesthetic or tactile learners**

FLEMING CLAIMED THAT:

- **Visual learners have a preference for seeing, thinking in pictures and need visual aids.**
- **Auditory learners best learn through listening, lectures, discussions.**
- **Reading and writing learners prefer text based input/output to learn new concepts, by either reading or taking notes.**
- **Tactile/kinesthetic learners prefer to learn via experience, moving, touching, and doing.**

Not everybody receives and processes information the same way. To complicate things further, some have a preference for one of the four, while others a combination of two or all four. The trick is to find out from your students how they learn, so you can decide how you will teach them.

Why is it so important to be aware of your students' different learning styles?

If you do not understand the whole concept of learning styles, you will find yourself teaching your lessons in your own learning preference. This is all very well for the students who match your learning preference, but what about all the others? They may learn eventually but not effectively.

Teaching a group lesson requires skilful teaching to ensure that everybody has the best chance of grasping the learning experience. At times you will need to address all the different learning preferences en masse. For example, as you present a new learning segment you target all the learning preferences by explaining, drawing in the snow, demonstrating and having a go.

Throughout the lesson you will need to devote time to each individual student. This is when you need to be aware of your students' preferred style so that you can maximise their learning.

How do you find out your students' preferred learning style?

Often the students are not aware of their preferred learning style. A good way is to ask them about a previous lesson (either in skiing/boarding or any other sport such as golf or tennis) that they found beneficial. Other times a trial and error approach will be needed and the learning styles sometimes show themselves through success at different points in your lesson.

Why did they enjoy the lesson and why did they learn so much?

Discussing this usually gives you a clue about their learning preference or at least a way they prefer not to learn. Another clue about students' learning styles can be gained from observing how they react when you introduce a new learning segment. Some will be keen to see a demonstration so that they can copy it; some will want to form a picture in their head from your explanations; and some will try to understand what it should feel like.

Sometimes you just have to ask them straight out, "how do you learn best - by listening to an explanation, watching a demonstration or by feeling the movement?" Confirm their assessment with your own observations.

2.3.2 TEACHING TO SPECIFIC POPULATIONS

CHILDREN

As children are often less aware of the consequences to their actions, safety should be the primary concern when teaching children's lessons.

To increase the prospect of learning, your lessons should be fun and relevant to the child's interest, while an understanding of how children learn developmentally will allow you to adjust your lesson to meet their developmental level rather than chronological age (for more information see ch. 4).

OLDER SKIERS

As people age gracefully they experience physiological changes, including a reduction in work capacity, heart-lung efficiency, endurance, power, strength, agility and coordination.

This may mean that older guests could have less interest in hours of exercise or indeed the perfection of their skiing skill. They may prefer to gain tactics and simple movement patterns to enable them to continue their skiing career for as long as possible. They want to minimise their output while maximising their results.

All adults like to be included in the lesson process and have a wealth of experience that they can draw from (even if it's from other sports). However, there are some important concepts to consider when instructing older skiers:

- **Remember to check if there are any medical, health or injury issues that can affect their ability to ski.**
- **Include longer warm-up and cool-down periods.**
- **Be aware that strength and endurance capabilities slowly decrease with age but can be improved with training.**
- **Lower the intensity of lessons to suit and provide adequate alternatives.**

www.ausport.gov.au/coach 'Coaching older athletes'

GENDER

In this part we explore some differences between male and females at an anatomical and cognitive level, remembering that these attributes can vary between individuals.

'Q' angle (see 3.3.9):

The width of the pelvis can change the appearance of the angle of the knees when viewing how the femur aligns with the lower leg.

The greater hip width of women gives them a slight X shape in the legs. This can have an effect on the ability to roll both skis onto their edges at the same time, achieving good edge grip and transitioning from turn to turn. Cuff alignment and/or custom foot beds can be of benefit.

Males can tend to be less flexible in the pelvis area especially as they age and this can affect their ability to turn the legs independently from the pelvis. Dry land stretching can help to increase mobility in this area.

Bone length and the calf muscle:

The bones of the average woman's leg tend to be shorter than a man's of the same height. A woman's calf muscles are also longer than and attach lower on the leg compared to men. This makes fitting boots a challenge as most boots will generally fit higher up on the lower leg. Female specific boots have a lower cuff length to assist in leverage and comfort.

Center of Mass (CoM) (see 3.4.5a):

The average difference between men and women's centre of mass (CoM) is approximately 2.5cm due to the shorter leg length and larger pelvis. More of a female's body mass is concentrated at the lower portion of their body making their CoM slightly lower.

Cognitive variations

Males are more inclined to want a general overview of a situation and will disengage if stress levels become too high. Often males would rather 'just have a go' and respond favourably to a competitive environment.

Females prefer to be given more detailed information. They are also more likely to remember every part of a stressful event. This can trigger an emotional response that is directly linked to a past experience. Therefore, women tend to appreciate more 'context' in their learning (why, where, how) and value participating in a non-critical and supportive environment.

2.3.3 INTRODUCTION TO COACHING

WHAT IS COACHING?

Recreation or FUN, is the expenditure of time in a manner designed for therapeutic refreshment of one's body or mind.

Sport is an activity that is governed by a set of rules or customs and often engaged in competitively.

With this in mind the majority of instructors are helping guests have a fun experience on a recreational holiday. The moment that a guest wants to participate in an organised event or has a specific goal to meet, the instructor needs to start coaching. This includes coaching activities in Snowsport Schools such as interschools products, masters and seasonal programs.

Coaching an activity that has a set of rules governing it, is not only rewarding for the instructor but it also adds to the overall experience for the guest. Being a good coach takes experience and time; the same could be said about many experienced APSI trainers and top-level instructors. This is because many top instructors not only help their guests have a fun experience on the snow; they also coach them, helping them reach goals and aspirations, both small and large.

QUALITIES AND SKILLS OF A COACH

To keep it simple, a coach should strive to be an 'inclusive coach' and the qualities and skills they should portray are:

- **Patience: recognising that some participants will take longer to develop skills or make progress than others.**
- **Respect: acknowledging difference and treating all participants as equals.**
- **Adaptability: having a flexible approach to coaching and communication that recognises individual differences.**
- **Organisation: recognising the importance of preparation and planning.**
- **Safe practices: ensuring that every session, whether with groups or individuals, is carried out with the participants' safety in mind.**
- **Knowledge: utilising knowledge of training activities and how to modify them in order to maximise the potential of every participant.**

During a usual snowsports lesson, the instructor teaches new skills to their guest, whereas a coach has to train an athlete in preparation for an upcoming event or goal.

This changes the format of the lesson to a 'training session'. All training sessions should include:

- Course inspection/slip (if being used in that session).
- Warm up and stretch.
- A technical or tactical approach to improving performance practised in blocks or sections.
- Followed by combining these sections to simulate competition.
- Maintenance and closure of the course (if being used in that training session. The coach will also have to continually monitor and maintain the course set and safety).
- Cool down.

The length of time and multitude of training sessions can vary from a one-hour pre-booked Interschools private to season-long training programs. Either way, a simple strategy needs to be followed to ensure a positive training effect. This strategy includes five equally important skills that a coach must include in every training session.

1. Organising
2. Analysing
3. Improving Performance
4. Observing
5. Communicating

1. Organising

Is the ability to organise efficient and effective sessions. Organising is based on knowledge and planning (e.g. organising hill space, course equipment, correct athlete equipment and slope preparation).

2. Observing

The coach should be aware of what is happening at all times (e.g. the athlete's arousal level to meet peak performance).

3. Analysing

Coaches are continually evaluating performance. Do not act on just one observation; rather find out if there is a pattern of error. Coaches will also need to perform a self-evaluation as part of their own personal growth.

4. Communicating

The coach's job depends to a large degree on their ability to communicate; not only verbally, but listening and using appropriate non-verbal communication (with athletes, parents, other coaches and officials).

5. Improving performance

Improving performance is the major role of coaches. It can include either a technical or tactical approach both in and out of the course over a short or long period.

To further enhance your understanding of what it takes to be a 'good coach' it is strongly recommended that you participate in a coaching course which starts with The Beginning Coaching General Principles. This is an on-line course to help new coaches improve their understanding of generic principles of coaching and athlete performance that apply to all sports. Available through the Australian Sports Commission (ASC) website: www.ausport.gov.au

CHAPTER TWO: Teaching Concepts

SECTION FOUR:

TEACHING FOR THE INDIVIDUAL

2.4.1 INTRODUCTION TO SPORTS PSYCHOLOGY

The aim of sports psychology is to help athletes reach and maintain what is called "Ideal Performance State" (IPS). This is the optimal state of physiological and psychological arousal for performing at your peak and can be likened to the feeling of being "unbeatable", "in the zone" or "on a roll."

It is our responsibility to apply the techniques of the sports psychologists (people who work in partnership with athletes to help them attain IPS) and create an environment that will help our students and athletes reach IPS when learning to ski at all levels. In striving to achieve IPS, an understanding of the following four points is necessary.

- **Goals**
- **Mental imagery**
- **Arousal control**
- **Concentration**

2.4.1A GOALS

A goal is defined as attaining a specific standard of proficiency on a task; usually within a specified time limit.[20] Setting both short and long-term goals is important to maintain motivation and will facilitate the attainment of success.

Short-term goals help our students see immediate improvements, provide regular experiences of success and also assist in enhancing their motivation. Short-term goals also allow students to remain focused and keep moving towards achieving their long-term goals.[21]

Long-term goals, although distant, specify the achievement of some standard or outcome at some defined stage in time.[22] A simple staircase or ladder analogy can be used to explain the relationship between short and long-term goals. The top of the staircase represents the long-term goal and the lowest stair the student's current ability level. Each step on the staircase represents a series of progressive short-term goals that are increasingly more difficult.[23]

Realistic goals

It's important to set goals that challenge but are achievable.

Set personal goals

The goals must belong to the student. The student is the person who needs to be motivated by the goals and as such they must set the goals and work/strive to achieve them. The instructor's role is to help initiate the goal setting process and assist the student to identify their goals (see Nine Lesson Essentials 2.1.2).

Goals should be positive

Help the student to focus on success by basing their performance goals on positive actions ("let's make 10 short turns") and refrain from setting goals based on what you should not do ("don't make the short turns too long").

Strategies to achieve goals

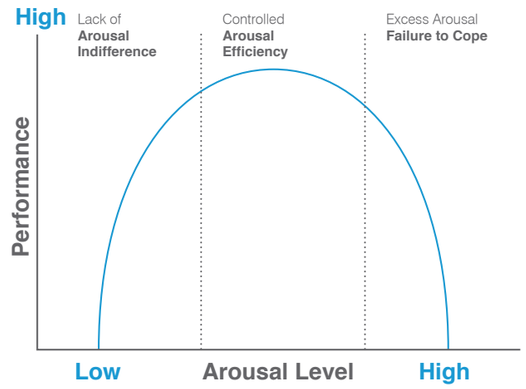
Identify where more effort should be placed. Areas to look at could include fitness, strength, technique, time frames, nutrition or mental skills. Encourage your students to partake in a training or fitness programs a few months (preferably all year round) before their ski holiday. This maximises progress and enjoyment on the slopes while minimising the risk of injury.

Adjust and evaluate goals

Remain flexible with goal evaluation. There are many factors such as snow conditions, size of the group, fitness levels and athleticism of the students that contribute to the need to constantly evaluate and adjust the goals.

2.4.1B AROUSAL CONTROL

Arousal levels impact a skier's ability to perform. The inverted "U" theory shows the relationship between arousal and performance. As the diagram indicates, for peak performance there is an optimal arousal level.[24]



THE INVERTED U RELATIONSHIP[25]

The Inverted U Relationship

Arousal levels that are too low (caused by boredom, fatigue, distractions, lack of interest, lack of challenge) result in a state of lethargy.

Arousal levels that are too high (caused by fear, nervousness, anxiety, frustration) result in slower reaction times, poor coordination, shaking, increased heart rate and tightening of the muscles.[26]

We have considerable control over the arousal levels of our students and it is our responsibility to ensure that they do not drop too low or rise too high. Our students also need to develop an awareness of their body's arousal levels and learn how to apply certain techniques to control these levels.

Techniques to help cope with excess arousal:

Positive Self-Talk: Never think or say "I can't". It is easy to allow negative thoughts to take over and become self-fulfilling prophecies but you need to force yourself to stay positive and see positive outcomes.[27]

Centring: Take a few deep breaths; pause at the top and bottom of the exhaling. Concentrate on tensing then relaxing each muscle by starting at the head and working to the feet. Eventually, with practise, you should be able to gain control over your muscles as well as slow your heart rate.

Key words: Talk yourself through the 'technique' you need to succeed. Use key words that remind you of the actions needed e.g. press then twist ski, instead of long-winded technical thoughts running through your head.

Acting: When negative emotions get the better of you it is easy to let them take control. Professional athletes learn to overpower negative emotions by acting out a positive and confident persona. Even in the face of extreme adversity, acting out a confident persona allows the positive emotions to bring arousal levels back to optimal levels.[28]

[20] *Gould in Williams, 1998 pg183*
[21] *Gould in Williams, 1998 pg187*
[22] *Pyke, 1991 pg168*
[23] *Gould in Williams, 1998 pg187*
[24] *Pyke, 1991 pg188* [25] *Pyke, 1991 pg188*
[28] *Bond, AIS 1988* [27] *James E Loehr, 1994* [28] *James E Loehr, 1994*

2.4.1C MENTAL IMAGERY

Mental imagery, also known as mental rehearsal or visualisation, involves using all the senses to recreate or create an experience in the mind. It is a mental technique that programs the mind and body to respond optimally.[29] It's used to help reach IPS by focusing on performance goals, competition simulation, familiarisation of new ski runs or race courses, arousal control, stress management and boosting confidence levels.

How do you perform mental imagery?

Low arousal levels are a prerequisite to mental imagery. Practise in a quiet environment, for example, before going to sleep or after waking in the morning. Once you are able to master the basic skills you can then practise on the ski hill. Other senses can be included in your imagery practise. There is research to suggest that playing music as you rehearse or imagine the sound of waves at the beach, if this is a pleasant image, can have a positive impact on motor performance and perception of movements. This type of rehearsal is known as a type of sonification.

- **Vary the perspective of the image and see yourself from different angles; Imagine you are watching yourself, like being on a video. This is known as 'outside – in'.**
- **'Inside – out', from your eyes as you are in motion and you may switch these images throughout the visualisation.**
- **Learn to control the speed of the image. Slow it, freeze it and replay it.**
- **Repeat the image until you see yourself performing the task correctly. If you make a mistake rewind it and play it over again until a positive image is developed.**
- **Develop a zoom image. Focus in on the problem area in your run and adjust the image.**[30]
- **The final image should be in "real time."**
- **Visual images are the prominent but not the only form of mental imagery. By involving our other senses such as sound we can enhance the vividness of the image. Imagine the smell, the feel, how long the pressure is held, how the wind tastes, etc.**

[29] *Vealy and Greenlead in Williams 1998, Page 238* [30] *Bond, AIS 1988*

2.4.1D CONCENTRATION

Concentration is about paying attention to what you are doing and what is going on.[31] **It refers to the way you focus your thoughts on a given sport or activity and is crucial for achieving IPS.**

Focus

Successful concentration requires a person to control the width of their focus, which can range from a broad focus to a narrow focus.[32]

Narrow focus involves concentrating on the immediate, relevant aspects of a task and all other thoughts are closed out. Mistakes may occur if the concentration remains in narrow focus for the whole performance. For example, if you only focus on absorption in the moguls you may find yourself losing speed control at times.

Broad focus involves concentrating on all aspects of the task. You are seeing the big picture rather than just a smaller part. Mistakes are again made if your focus remains too broad for the whole performance.[33] Some sport situations require a narrow focus, others broad and some both at the same time. Introverts tend to have a 'narrow' focus and extroverts a 'broad focus'.[34]

Body awareness

World-class athletes have a complete understanding of what their body is feeling, how it moves and the positions of the body parts. Our students may not be world-class athletes but we need to help them become aware of their body movements. When first learning a movement or skill, moving a small amount feels like you are moving a huge amount. Encourage the students to exaggerate because only then will they come close to making the correct movements. Video is very helpful in this process.[35]

Smart thought

This involves having a plan or strategy, as well as knowing which techniques to apply and when to apply them. Having an appropriate plan can facilitate concentration.

Psychologists agree that good concentration is also about:

- **Keeping it simple. The brain can only handle so much information before it becomes cluttered.**
- **Performing in the now. Keeping your focus on what needs to occur now is probably the most important of all.**

Instructors and coaches interested in expanding their knowledge in this area should refer to the appendix for further references.

2.4.2 A DEEPER UNDERSTANDING OF HOW PEOPLE LEARN

The learning cycle

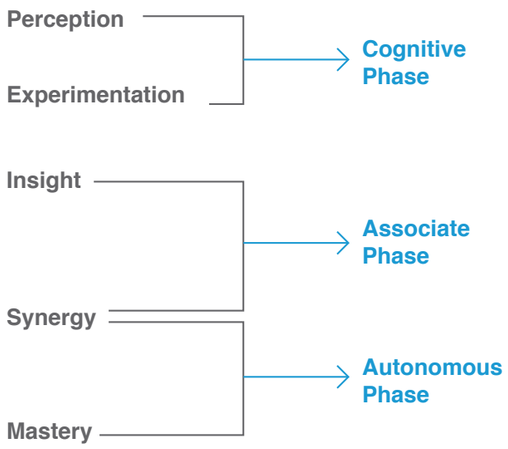
Learning occurs when we become aware of a change in our experience while performing a skill. It is a simple statement but one that we need to keep referring back to. Awareness is the key. We need to not only teach the steps but also educate our guests how to learn and what to be aware of, which often starts by recognising what and how we are performing.

It is well documented that learning occurs in sequential steps. Each phase is as important as the next. Understanding these steps and, more importantly, recognising when they occur and when it is time to move on is in itself a skill that most instructors take years to develop. All too often we rattle through the progression without observing whether true learning has occurred or whether our guest has just achieved success by chance. By understanding the learning process we will be better prepared to teach an effective lesson.

In this part of the chapter we will cover many concepts that all give insights into the learning process. It is an art, not a science, and it will be up to you to use what you understand and apply that to create a true learning experience. This part of the chapter in combination with the development chart in 'teaching children' (Ch. 4) will help you observe at what phase a child's learning is at.

[31] *Harris & Harris, 1984 pg77* [32] *Nideffer & Sagal in Williams, 1998 pg267*
[33] *Smart Sports, AIS* [34] *Bond, AIS 1988* [35] *Smart Sports, AIS*

2.4.3 THE LEARNING PHASES



2.4.4 COGNITIVE PHASE

The cognitive phase of learning is concerned with the learner developing an idea, image or concept of the entire skill to be learned. This image is really a patchwork of existing movement experiences, all collected from previous motor programs. This phase of learning includes perception and experimentation.

2.4.4A PERCEPTION

Learning a new skill starts with an idea that inspires. We might see a skill being performed and picture ourselves doing it. Likewise, imagine how that might feel, or at least perceive how we can benefit from performing it that way. That initial vision is very important as it is this picture that starts the learning process. The student recognises the skills involved in parts and tries to associate them with what they already know.

In this part of the cognitive phase the guest will need to understand what is new, why and how to do it.

INSTRUCTOR'S ROLE

At this phase we need to keep it simple. Give clear demonstrations and impart the least amount of technical information to achieve a result.

2.4.4B EXPERIMENTATION

In this part the student will learn by playing and experimenting. It is their turn to test their perception of what has been presented. They need to exaggerate the movements. They should experiment with the degree of effort - do too much, do too little, notice how each differs and how these movements affect ski performance. In order to try different skills they will be forced to move in ways that are not familiar so their comfort levels will be tested.

INSTRUCTOR'S ROLE

Our role turns into a facilitator. Set guidelines such as where to ski, the correct terrain, shape and speed of turn or movements desired. Discuss how much or little to move while keeping feedback to a minimum. Motivate and reassure them to take a risk and discover new sensations. Ensure they understand that experimenting and exaggerating may feel 'funky' or less dynamic before it feels better.

They may lose balance or fall over before they find out how far they can go. We need to check for understanding, so let them discuss what they discovered and share this with the others in the group. This will engender a team psyche and they will be encouraged to help each other, redefine the focus and experiment again.

2.4.5 ASSOCIATE PHASE

This phase of learning is concerned with making the skill more fluent (though not yet automatic), as well as executing the correct movement in the right order. This phase uses insight and starts to deal with synergy.

Errors of movement may involve such things as the wrong sequence to the parts of the movement (trying to match the inside ski before the edge has changed), the occurrence of inappropriate movements in a sequence (leaning back at the end of the turn), or the wrong timing of the various movements in a sequence (up and down movement in a turn).

2.4.5A INSIGHT

Here the student starts to link or make connections. They will associate the movements made with how the skis perform. You could say this is where light bulb moments occur. Their skills are not refined so they will need to practise the skill in parts.

INSTRUCTOR'S ROLE

The key here is to loop back and forth from the experimental phase, discuss what has been discovered and give more accurate feedback. Set new parameters of what is desired.

Ski behind the guest and talk to them as they ski e.g. yes, good turn, no, yes, more edge, etc. Vary who leads and let them make the decisions as to the speed, radius and terrain. They need to be more in control of the process. You are helping them to make informed decisions and increase their independence and confidence as skiers. Isolate a part of the movement and practise only that. Once that part can be performed then add that to the whole movement. Use of video as feedback for the skier can be invaluable at this stage.

2.4.5B SYNERGY

This is where the movements become more natural and better coordination is shown. The skill can now be performed in differing snow conditions and steeper terrain. Although performance is not without thought, the skill is more comfortable.

Self-analysis also becomes a dominant form of feedback. Sadly, some skiers will never progress past this stage.

INSTRUCTOR'S ROLE

Teach not only parts but also whole movements. Work on the refinement of movements, timing and coordination. Change the task, not the goal (try different exercises) and vary the terrain and snow conditions. There should be repetition of similar movements working towards patterning. Lots of questioning can help the skier work towards an accurate self-analysis (how did that feel? etc.).

2.4.6 AUTONOMOUS PHASE

The autonomous phase of learning is characterised by performance that becomes largely automatic and independent of the normal attention demands that accompany any motor performance. One problem an instructor faces is when a student has reached this stage of learning but their technique is flawed. We have all seen students who have skied the same old mistakes for years. To correct their technique, the skier will have to regress to the associate phase of learning and spend time feeling less comfortable before a change can be made, thus the autonomous phase includes some synergy and mastery.

2.4.6A MASTERY

Movements are now automatic i.e. they are performed instinctively. Once this level is achieved it is possible to concentrate on different tactics without concentrating on technique e.g. change a particular line through a mogul field.

INSTRUCTOR'S ROLE

Lots of mileage is needed. Push the speed, steepness and test out their comfort zone in varying snow conditions. All the practise has been done and now it is time to perform.

Sports psychology comes into play. Teach your guest some tactics e.g. the student can perform good short turns so they can now learn to look for a good line in the bumps or trees. The skills have been so well trained that they can now concentrate on other things.

2.4.7 HOW LONG TO SPEND ON EACH PHASE?

To teach well, instructors need to have a good understanding of these learning phases. Utilising the information under 'instructor's role' outlined above will help. However, it is also important to note that there are other factors that the instructor needs to be aware of when moving through the learning phases, as these will greatly affect how much time is spent at each phase.

These factors include:

- **Arousal**
- **Mental practise**
- **Motivation**
- **Types of feedback**
- **Knowledge of performance (KP)**
- **Knowledge of results (KR)**
- **Using internal and external cues**

Remember, each individual learning experience will be influenced by these factors and people deal with each factor differently. This will greatly determine how much time is spent at each phase.

2.4.7A AROUSAL

Arousal refers to the state of the central nervous system as it receives and processes information. The arousal level of an individual varies from a very low point during deep sleep to very high levels associated with extreme excitement or anxiety.

For most activities the optimal state of arousal needs to be of moderate intensity to guarantee maximum performance. The teaching segment, task or exercise that an instructor presents must be challenging enough to be interesting but not so difficult as to cause frustration and added stress.

Research has shown that heightened arousal or stress levels can also have a negative impact on decision making which could lead to unsafe situations. The data shows that higher cortisol levels (stress) in males can lead to greater risk taking behaviors resulting in a decrease in performance. Interestingly, a slightly elevated stress level for females resulted in an increase in performance, though a high level produced the same decreased performance as men.

2.4.7B MENTAL PRACTISE

Mental practise can be defined as improvement brought about by thinking about a skill or watching someone else perform it.

To study the effectiveness of mental practise, three subject groups are normally used. All three groups are first tested on the movement to be learned. One group then physically practises the skill, the second group either watches someone else perform the skill or just thinks about it and the third group does nothing.

These three groups are then retested on the skill and scores are compared to their original test to see how much improvement took place. Although physical practise produces the best improvement, a combination of less physical practise and more mental practise produces improvements that are almost as great.

It is important to note that it is productive to have your students rehearse the movements before their turn. Mental practise is more effective if the learner has prior experience with the task. Research studies have also suggested that complex skill acquisition is enhanced if observation/imagery of the perfect task is performed just before going to sleep.

2.4.7C MOTIVATION

Motivation refers to an inner drive, emotion or desire that causes a person to do something.

The primary force is a physical and psychological need to remain safe and healthy. The need to be accepted by others, especially their peers, is a great motivator. In particular, athletes are driven by the challenge to learn and display their new skills.

As a teacher we can motivate through pep talks, rewards or punishments, but these techniques have little long-term success. To truly motivate we need to create a safe and fun environment where challenges not only excite but are also achievable. Here the student is not only rewarded by the praise of others but motivation is derived from within.

2.4.7D TYPES OF FEEDBACK

Feedback refers to the information a person receives about the performance of a skill, either while they are performing it or after the skill is completed. Feedback can come from an external source (instructor or fellow student) or from an internal source (Visual, Auditory or Kinesthetic).

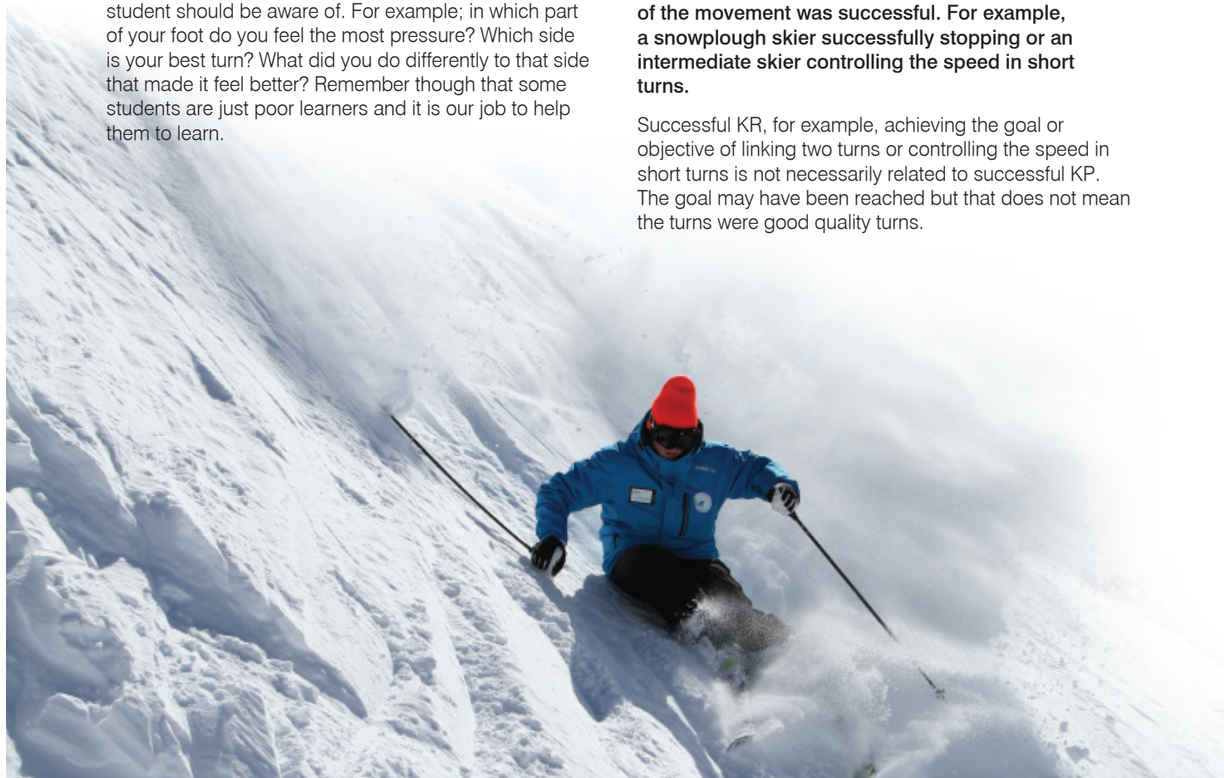
Kinesthetic feedback is information that arises from sensory receptors other than the visual and auditory systems. It represents information that arises from a wide variety of sources such as the receptors of touch, stretch, pressure, balance (the inner ear), joints (detect how straight or bent a joint is) and muscle spindles (detect how quickly and how much the muscle is moved).

2.4.7E AWARENESS OF FEEDBACK

Every individual's sensory system is unique. This means that a certain explanation, demonstration or feeling that works for one student may not work for another. The process of developing the student's awareness requires you to give them several ways to feel and perform the skill or movement.

For example, if the outside ski is too flat in a snowplough turn, there are many ways to explain how to edge the ski more. Ideas include roll the foot, feel the ski bite or grip, feel the ankle against the side of the boot, feel pressure on the inside of the arch, roll the knee, listen to the snow or press the big toe in the snow.

Ask probing questions to narrow in on the area that the student should be aware of. For example; in which part of your foot do you feel the most pressure? Which side is your best turn? What did you do differently to that side that made it feel better? Remember though that some students are just poor learners and it is our job to help them to learn.



2.4.7F KNOWLEDGE OF PERFORMANCE (KP)

Knowledge of performance is the feedback that an individual receives about the actual performance or execution of movement. It is based upon feedback received during the performance of a skill and aids the individual to assess the correctness of their movements.

This type of feedback is stored in memory so that it can be used at a later time for movement evaluation. For example, a student attempts a snowplough turn, consciously rolls the ski on edge while turning but ends up railing and not turning. Next time they try a turn they will remember that this amount of edging prevents turning.

2.4.7G KNOWLEDGE OF RESULTS (KR)

Knowledge of results is the feedback information that an individual uses to assess whether the objective of the movement was successful. For example, a snowplough skier successfully stopping or an intermediate skier controlling the speed in short turns.

Successful KR, for example, achieving the goal or objective of linking two turns or controlling the speed in short turns is not necessarily related to successful KP. The goal may have been reached but that does not mean the turns were good quality turns.

2.4.8 USING INTERNAL AND EXTERNAL CUES

When a skier is focusing on a new skill or reinforcing an old one they have two ways of doing this. Internal focus and external focus.

Internal Focus is to concentrate on a specific body part in movement. For example; rotate your leg in the hip socket, flex your hip or move your hips laterally at the top of the turn.

External focus is to concentrate on the outcome of the movement. For example; unscrew a jar lid with the sole of your foot, leave a 30cm track in the snow, feel like a rope around your waist is pulling your hips back or spray snow back up the hill.

Can you relate to these two types of cues? Which one do you use most for clients? Do you use internal or external cues for yourself in training?

Recent research on a ski simulator has evidence that an external focus of attention is more effective than an internal focus. This highlights that focusing on the relationship your body has with the environment is very important in learning a skill. Focus on the outcome rather than the movement itself.

We can do our own test with a jump using an internal and external cue. First, think of flexing all your joints getting ready to jump. Then think about extending through the ankles, knees and hips to jump. Then, get a friend to hold a $50 note up high and try to jump as high as you can to reach it. Note the difference in height between the two.

Second test. Hold your arm out in front of you. Keeping your arm muscles strong and engaged get a friend to try and push your arm down. Now hold you arm up again but this time think of a beam of energy coming out of your arm and extending far beyond your hand to a point in the distance. Get your friend to push down again while you focus on the beam of energy.

These tests highlight that focusing on the relationship your body has with the environment is very important in learning a skill. Focus on the outcome rather than the movement itself.

There have been many tests done on skills involving precision, efficiency, endurance and strength. They all point to the conclusion that external cues outperform internal cues. There is even research that shows that internal cues can be detrimental in performace ('the choke'). When we focus on the movement itself it disrupts autonomic motor control processes that regulate coordinated movements. We interupt processes in our body that are designed to do this automatically.

So does this mean we should only be using external cues when teaching?

Skiing is an open sport, meaning that there are many ways to achieve the same outcome. Therefore, focusing on the outcome is very important. However, skiing is also something that does not come naturally to us. Throwing, jumping, running are all built into our system and have been programmed over thousands of years. Carving a turn isn't. You can't just tell a new skier to spray snow out to the side as they may not even realise a ski can do that. So, when learning a new movement or in the early stages of skiing, internal cues are very helpful in becoming aware of what we are doing. An external cue can then be used later to help increase the performance, efficiency and accuracy of the task.

See the example of internal and external cues used to help edging earlier on the following page.

Internal:

Roll your ankles over to gain more edge grip at the start of the turn.

External:

At the start of each turn show the bases of your skis to somebody back up the hill.

SUMMARY

Helping our guests become better learners is what our job is all about. Knowing whether a guest is truly aware of a change in their performance takes years of practise. To become proficient you will need to understand the different phases of learning and be aware of the individual factors that affect how long a guest remains at each phase. You will need to facilitate all of this before true learning can occur.

CHAPTER 2 REVIEW

Teaching concepts

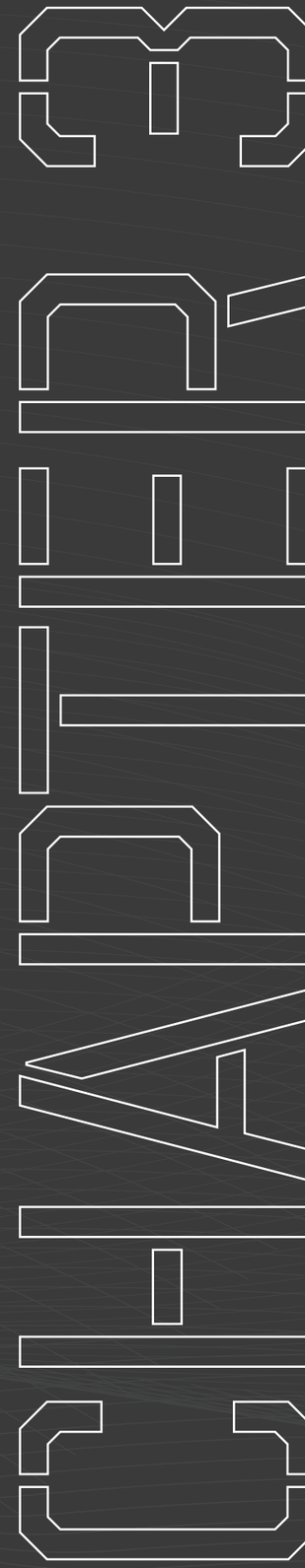
1. Explain: What is meant by experience centred teaching.
2. List the nine essentials.
3. Explain: How you loop through or repeat the nine essentials?
4. Write two clever analogies to explain a snowplough.
5. Why is it always important to explain to your guests what, how and why you are doing something?
6. What are the three points of the movement analysis system?
7. What are some non-skill related reasons for poor ski performance?
8. Feedback needs to be based on which three principles.
9. Give a few reasons why you should not use the one at a time feedback method.
10. What is class handling?
11. What does VARK stand for?
12. How do you find out your students' preferred learning style?
13. What are the five teaching styles?
14. What are the five skills that can help with coaching and give an example of when these skills would come in handy while working in your skis school?
15. What are the three phases of learning?
16. These three phases of learning have five subsections, briefly describe the instructor's role for each of them.
17. Explain: What is Ideal Performance State (IPS)?

TECHNICAL CONCEPTS

About this chapter

Chapter three, technical concepts deals with the theory of skiing. It will show you a breakdown of the skiing skills and the phases of the turn. Which body parts we move (basic anatomy), how (physiology) and why we move them (physics). The chapter will help your skiing and teaching by improving your mechanical understanding.

An understanding of these technical concepts makes describing and analysing movement patterns easier.



CHAPTER THREE: Technical Concepts

SECTION ONE:

THE SKILLS OF SKIING

3.1.1. A BASIC OVERVIEW OF THE SKIING SKILLS

Stance (the way you stand on your skis)

Rotary (the way you turn your skis)

Edging (the way you tip your skis over)

Pressure control (the ability to manage pressure to make turns and deal with changes in terrain and snow conditions to maintain balance)

Skiing is a collection of complex movements that are coordinated to produce specific results. It is crucial for learning and teaching the sport to break skiing down into building blocks, known as the skiing skills.

The body's central nervous system cannot take in and process all the information necessary to perform a complex skill on the first attempt. For example, a perfect double back somersault with two twists or hitting a golf ball 250 metres must be broken down into parts to learn effectively. It takes time for the body to learn the skills that make up a sport.

Breaking skiing down into the skills allows us to better:

- **Understand skiing**
- **Learn skiing**
- **Teach skiing**
- **Analyse skiing**
- **Change our skiing**
- **Keep it simple for our guests to understand**

3.1.2. BLENDING THE SKILLS

Every turn in our progression, from a snowplough turn to dynamic short turns, requires an appropriate blend of these skills to produce a good quality turn. If the skills are blended and performed well, BALANCE is maintained. If the blend is incorrect, or if any of the individual skills are performed poorly, skiing becomes inefficient and maintaining BALANCE is more difficult.

Achieving the appropriate skill blend for a certain task will enable the skier to:

- **Turn across the hill (finish the turn) to control speed.**
- **Be more stable and balanced through the turn.**
- **Ski more efficiently, creating a smoother and effortless motion.**
- **Perform more dynamic skiing in different terrain and snow conditions with greater success.**

When teaching skiing you will find yourself focusing on a variety of different body movements to achieve success in the individual skills. It is not until these skills are trained into the body and blended together, that true realisation of success can be recognised.

3.1.3. STANCE

Stance describes the way a skier stands on the skis and a good stance is important in all levels of skiing. Efficient, well-balanced skiing is not possible with a poor stance, particularly as the speed increases; the slope gets steeper or the snow conditions become more difficult.

We look at a skier's stance in three dimensions:

- **Vertically (up/down)**
- **Forwards/backwards**
- **Laterally (width the feet are apart)**

Stance is not a static position during a turn, the skier will move up/down, forwards/backwards and alter the width for the situation but never so much as to compromise the overall balance. Arm position is included in how we stand on our skis and is an important part of our stance and balance.

To understand the correct stance, the following points illustrate how to athletically stand on your skis when stationary:

An athletic stance when a skier is stationary.

3.1.3A. VERTICALLY:

- **Similar flexion in ankles, knees and hip joints.**
- **The back runs parallel and at the same angle to the shins, it can be rounded slightly but not arched (preferably the spine is in a neutral position).**
- **It's an athletic position with room to move up or down (when in motion this is sometimes referred to as the middle position).**

3.1.3B. FORWARDS/BACKWARDS:

- **Body weight is evenly distributed along the sole of the foot; you should feel balanced on the whole bottom of your foot. This results in the balance being over the centre of the feet.**
- **In advanced skiing fore/aft movement of the feet in relation to the Centre of Mass (or vice versa) is used to move the pressure to the front or the back of the skis when required (e.g. pushing feet forward or pulling the feet back).**

3.1.3C. LATERALLY:

A good guide for an athletic stance (how wide the feet are apart) is a natural hip width apart. If you imagine a person gripping a pull up bar and letting their legs hang underneath them, their legs would fall from their hip sockets into a natural width for their skiing stance. Therefore, people with narrower hips will tend to have a narrower stance and those with wider hips will have a wider stance.

- **The stance width will also change in situational skiing.**

Powder on narrow skis = Narrow stance

Allowing the skis to float better from one platform.

Powder on fat skis = Neutral stance

Floatation is not an issue, therefore other skills will function better from a neutral stance.

Crud = Narrow stance

Both skis will be affected similarly and travel in the same direction when influenced by the crud.

Groomers/pure carving = Neutral/wider Stance

Beginning with a wider stance will help skiers achieve greater edging capabilities more easily. However, a skier who is well versed at pure carving can achieve this same edging with a neutral stance. It sometimes looks wider due to the vertical separation of a long outside leg and a short inside leg.

Groomers/carving = Neutral stance

Making the blend of edging and rotary easier.

Ice = Wider stance

Greater edging can be achieved to grip the ice and it will be easier to balance.

Moguls = Narrow stance

Enabling both skis to be directed through the narrow trough and be affected the same if hitting or going over a bump.

The correct hand/arm position is to have the hands out to the side and in front, allowing for an efficient pole plant and helping to keep the skier balanced.

The stance of children aged 3-6 years will look different due to their higher centre of mass. For example; less ankle bend, slightly back and more bent in the waist are commonalities at this age.

Leg and core muscles contract isometrically when a correct, athletic stance is adopted. These already contracted muscle groups enable faster movement in any direction, such as recovery moves when maintaining balance. It also provides a stronger athletic position for the body when encountering outside forces such as turn dynamics, wind and terrain, etc. Therefore, balance can be improved by increasing muscle strength in both your core and skeletal muscles. A skier's balance benefits from agility and plyometric training so the muscles can react more quickly to sensory systems such as visual cues and information from the body's proprioceptors.

Stance problems are common and can be cured by analysing the angle of each joint and the posture of the upper body.

Provide your students with several analogies so they can picture what the correct stance would look and feel like. For example, similar to the golf address, cricket stance when batting, receiving a tennis serve, stance on a netball or basketball court, the stance wrestlers adopt when they are about to pounce on each other, etc. Correct stance is an athletic position that allows you to move freely in all directions.

3.1.3D. COMMON STANCE PROBLEMS

If the stance is too upright or stiff:

- **The body cannot apply a strong turning force to the skis due to the lack of leverage and isolation of weaker muscle groups.**
- **Angulation becomes very limited.**
- **Controlling pressure in dynamic turns and moguls is not possible.**
- **The body is slow to react or unable to move quickly.**

If stance is too low or flexed

- **The skier becomes fatigued more quickly due to the leg muscles being constantly strained.**
- **The skier's weight/balance falls back easily as the knee joint has the largest range and is generally the most natural to bend.**
- **Absorption in moguls cannot function because the legs are already bent.**

If the stance is too far forward:

- **Too much pressure at the front of the ski causes the back of the downhill ski to wash-out (down stemming).**
- **It is common for the skier to lose balance in difficult snow conditions (moguls, crud or powder).**
- **The skier will experience difficulty controlling the parts of the body that apply the turning force to the skis.**
- **The skier's knees can become unstable.**

If the stance is too far back:

- **The skier becomes fatigued more quickly as thigh muscles are strained.**
- **The skier has difficulty twisting their legs and finishing their turns, hence controlling speed is challenging.**
- **The body's muscular system tightens up to maintain balance making pressure control difficult.**

It is important to note that a skier's boot can have a profound impact on how they stand and balance on skis.

For more information see 8.2.3.

3.1.4. ROTARY

Rotary is the act of applying a turning or twisting force (torque) to the skis or body. This rotary force can be used to affect the direction we point our skis or align our bodies to execute the other skills.

Applying rotary to the skis allows us to make turns and vary the radius of these turns. Without rotary the only way to change direction is to use the side cut of the skis e.g. a railed turn, which is very limiting.

There are many ways we can apply a twisting force to the skis and at various stages in our skiing we may be compelled to use them all. There are pros and cons to each of the following rotational movements, however, a turning force from the legs is usually the most efficient and desirable technique.

Rotational movements:

- Leg Rotation
- Upper body and hip rotation
- Hip and leg rotation
- Counter-rotation
- Blocking pole plant
- Foot rotation

3.1.4A. LEG ROTATION

Leg rotation is simply turning our legs to make the skis turn. The actual movement originates from the femur bone twisting inside its ball and socket joint with the hip (see hip joint-5.4.8). Leg or femur rotation is an ideal technique as it isolates the strong muscle groups of the upper leg responsible for internal rotation and adduction. Using leg rotation in turns allows us to achieve the following:

- **Balance is maintained more easily if the legs provide the turning force and the upper body (centre of mass) remains stationary.**
- **The hips stay in a good position for edging and angulation.**
- **Greater force is provided from strong muscle groups.**
- **Subtle adjustments to the turning force can be made.**
- **The turning force can be sustained for longer periods.**
- **The turning force can be applied immediately.**
- **It places the body in an anticipated position for the coiling effect in short turns.**

A straight leg cannot exert as much rotational force to the ski as a bent one, therefore, twisting your skis is most powerful when performed from a flexed, athletic stance. When flexed, the rotational force is powered by the stronger adductor muscle groups that run along the medial and anterior portion of the thigh. In contrast, when the leg is straight, the weaker medial rotator muscles control this movement (gluteus minimus, inner hamstring etc.).

Compared to a straight leg, a bent leg gives added leverage when twisting. Imagine this is like undoing a tight bolt/nut on a car. The socket (and extender) alone have little leverage when trying to twist off the bolt. However, clipping on the lever extending out to the side places considerable more twisting force on the bolt.

Leg rotation can be both an active or passive movement.

Active leg turning: Where the leg muscles are actively turning and twisting the femur inside the hip joint, therefore turning the ski (the adductors that run along the anterior portion of the thigh).

Passive leg turning: Letting the legs turn independently under a stable pelvis from edging movements and ski design. This is how a basic position is created naturally in a dynamic long turn or pure carved turn. The femur still turns inside the hip joint, but it does so through edging movements and due to the natural arc of the skis pushing the legs around as the pelvis and upper body remain still.

3.1.4B. UPPER BODY AND HIP ROTATION

This was the technique of the 20s and 30s as it worked well with the equipment of that era. The momentum of the upper body rotation was transmitted to the legs and skis.

Problems associated with using the upper body to turn the skis are as follows:

- **Balance is easily disrupted due to the constant disruption of the Centre of Mass.**
- **Edge angles are reduced from the loss of angulation in body alignment.**
- **Balance on the outside ski is harder to maintain due to the loss of angulation.**
- **Subtle adjustments cannot be made to the turning force.**
- **The turning force cannot be sustained for long periods.**
- **Very quick short turns cannot be made as a result of the angular momentum that is created.**

Upper body and hip rotation is a common problem seen in students. For some students it may seem natural and easier to use the upper body to help turn the skis. This becomes a habit if not corrected immediately.

3.1.4C. HIP AND LEG ROTATION

It is common for skiers to use the legs and hips to provide a turning force. In these cases the skier may lack flexibility, muscle awareness or the muscle control required to keep the pelvis (hips) still and turn the legs only. When the pelvis (hips) is twisted it appears as if the skier is rotating their bottom, which can cause the skis to flatten or skid.

This type of rotation is quite common for 3-6 year old children as they find it difficult to separate their legs from their body and may move as one unit when turning.

3.1.4D. COUNTER-ROTATION

Counter-rotation is the small amount of turning force applied to the skis in one direction, by a fast twisting action of the upper body in the opposite direction. This is related to Newton's Third Law of equal and opposite reactions.

It can only work if the skis encounter little or no turning resistance from the snow, in other words they have to be in the air, flat on the snow or pivoting on top of a mogul.

It is a technique that will turn the skis when the skier has lost contact with the snow and is used more as a corrective measure by skiers (especially slalom racers) to throw the skis around the corner in a tight situation. You experience counter-rotation in short turns with no poles, especially if the arms are held close to the body. When going off a jump and doing a twister the principle of counter-rotation is applied.

3.1.4E. A BLOCKING POLE PLANT

This can exert a torque or rotary force on the skier. If the pole is planted at an oblique angle with the tip of the pole ahead of the hand, the snow pushes back on the skier's hand and applies a torque to the skier. This is used in situations such as short turns, especially on steep terrain and advanced mogul skiing. To be effective, the pole plant needs to occur during the transition when the skis are at their flattest.

3.1.4F. FOOT "ROTATION"

Twisting only the foot medially (inwards) results in supination. Turning the foot laterally (outwards) results in pronation. Therefore, when you only think of twisting from your feet, the outside foot may start to roll towards the little toe side, placing it in a weak position for edging.

This concept is very important to note when teaching people to 'turn their feet', as there are some people who try to do exactly what you are saying. These students may feel some pain in their knee or find that the skis are too flat when turning.

It is important to realise, however, that talking about turning your feet can actually result in turning the whole legs. It is often used to convey the idea of using the legs only to turn while keeping the upper body still. The only time you can turn just the lower leg (tibia) is if you bend the knee to 90 degrees (try this sitting down on a chair/couch when off your skis). For the majority of people (especially beginners), it is a simple notion to think of turning your feet to get the skis pointing in the direction they want to go.

3.1.4G. ROTATIONAL ALIGNMENT AND TERMS

These terms are commonly used when referring to positions that are created by various degrees of rotation.

Counter: is used to describe the position of the hips/upper body when they are facing away from the direction of the skis. Usually down the hill or to the outside of the turn.

Square: a position where the shoulders or hips are facing the direction of the skis.

Separation: describes the active movement of turning the legs under a stable upper body when moving.

3.1.4H. THE PIVOT POINT

The pivot point is the point on the skis around which they pivot or turn. In a round, steered or carved turn, the pivot point should be the centre of the ski/boot or underneath the middle of your foot. In turns that are not round but Z-shaped (often seen in beginners who have taught themselves to parallel turn by kicking the back of the skis around), the pivot point is further forward. In the classic 'heel pushed' short turns where the tails of the skis are thrust from side to side and the tips stay in the fall line, the pivot point is well towards the front of the skis.

3.1.5. EDGING

Edging is tilting or rolling the ski onto its side or edge. A ski that is flat on the snow has no edge angle. As soon as the ski is tilted on edge it has a certain amount of edge angle relative to the snow's surface.

With no edging it is impossible to achieve a direction change. If the skis are dead flat you will skid straight down the hill (in the direction of gravity), no matter which direction the skis are pointing or how vigorously you turn or twist the skis. They must be on edge for the snow to provide a force to push the skier around the corner.

Achieving the desired edge angle in skiing comes from an appropriate combination of movement in the following areas:

- **Ankle/foot.**
- **Knee (known as knee angulation because of the angle formed between the thigh and lower leg).**
- **Hip (known as hip angulation because of the angle formed between the upper body and legs).**
- **Whole body inclination (commonly referred to as banking).**

3.1.5A. ANKLE AND FOOT

With no ski boots on, you will notice that the foot and ankle can roll from side to side. Try this sitting on a chair, with the foot lightly on the ground and your hands holding the knee still. Roll your ankle by flexing or tighten the muscles that pull on the tendons on top of your foot. Inside a tightly fitting boot the ankle is solid, so rolling the foot causes the knee to move instead.

Rolling the foot and ankle medially while tightening the muscles and tendons (adductor hallucis and plantar interossei) on top of the foot is still very important because:

- **It complements knee angulation.**
- **It tightens the ankle/foot, helping to prevent the foot from supinating and rolling the ski flat.**
- **It helps the skier to become more sensitive to feeling what the ski is doing on the snow through the receptors on the bottom of the foot.**

Inside a loosely fitting boot, the foot, ankle and lower leg can move around significantly without transmitting this movement to the skis. It is important, therefore, to make sure the students' boots are done up correctly, at all levels.

3.1.5B. KNEE ANGULATION

Moving the knee to the inside tilts the ski on edge. Although you feel that the movement comes from the knee, it is actually a combination of knee flexion and femur rotation that gets the knee moving to the inside. The knee is a hinge joint and can only bend sideways if the ligaments are strained (which produces minimal movement).

Knee angulation works particularly well at slow speeds as edging is achieved easily without moving the centre of mass away from the base of support. However, performing faster dynamic long turns with too much knee angulation, will put strain on the knees and is not a strong position to resist the forces associated with the turn.

3.1.5C. BANKING (WHOLE BODY INCLINATION)

Tipping the entire body into a turn with no angulation is referred to as banking. Just like an airplane rolls or 'banks' into its turns, a skier's whole body can tip from side to side placing the skis onto their edges.

Compared to angulation, banking takes the skier's centre of mass further away from their base of support (i.e. the skis) to create the same amount of edge angle. This form of edging requires high speeds and significant centrifugal forces to become efficient.

Pure carved medium or long turns that are performed dynamically at high speeds require substantial inclination of the centre of mass. This inclination allows the skier to place their body in a strong position to resist being thrown to the outside of the turn by the centrifugal force. It is similar to riding a bicycle around a corner, as the faster you travel the more you lean in.

In skiing, inclination is blended with knee and hip angulation to produce the large edge angles needed for carving or pure carving. Angulation with little inclination produces a weak position to deal with the centrifugal forces, while banking with no angulation makes it difficult to stay in balance over the outside ski (unless done at very high speeds).

3.1.5D. HIP ANGULATION

Hip angulation is where the whole legs tip into the turn whilst the hips (pelvis) and upper body remain somewhat upright. You will see a distinct angle being formed between the outside leg and pelvis at the hip joint.

Hip angulation is created by a combination of counter (between the hips and the direction the legs are pointing) and bending forwards from the upper body and pelvis. This counter should be created in a turn by keeping the hips (pelvis) still, as the legs twist underneath (i.e. using upper/lower body separation to create it). Therefore, flexing forwards with the upper body and hips becomes crucial as the counter develops through the middle to turn completion (where we need the most angles to resist forces).

Hip angulation is useful in high speed/dynamic skiing where the forces encountered are high. It allows us to stack the bones of the outside leg on top of one another, to better resist the external forces. Hip angulation with the correct amount of counter allows the strongest muscles (quadriceps and glutes) to be used. Having either too little or too much counter can weaken the position.

This form of angulation is not unique to skiing and is a movement seen in soccer, rugby or Australian Rules football players as they make a side step to change direction suddenly. Another example of both knee and hip angulation is when you walk across a steep grassy slope. You dig in with the sides of your shoes by moving the knees and hips towards the hill and stay balanced by moving the torso away from the hill.

Angulation comparison between sports.

3.1.5E. SPINAL ANGULATION AND LATERAL PELVIC TILT

If there is no counter from the pelvis (i.e a square position) in relation to the skis, hip angulation is limited. From this square position a skier can develop some hip angulation from tilting the pelvis laterally (picture below). However, this is limited and most skiers will resort to either banking or spinal angulation.

Spinal angulation is where the spine bends sideways to try and produce the angulation required when edging to balance on the outside ski. It often feels like a pinching sensation between the pelvic girdle and the rib cage. Although this gives the skier some initial benefit, it places the spine in an unsafe position to deal with external forces and is not recommended for prolonged skiing. Hip angulation with an appropriate amount of counter provides far superior edging and balance over the outside ski, making it safer for the skier.

3.1.5F. COMBINING EDGING MOVEMENTS

It's good for our knowledge to look at all the different types of edging in their pure form. Skiing, however, is a constantly changing medium where the skier's outcomes change rapidly. Therefore, we use a blend of all these forms of edging to produce the desired action on the snow. Some situations call for a pure form of a specific type of edging, though most blend varied combinations of ankle, knee, hip and inclination together.

In long turns for example, all of the above areas are used, but most of the edge angle comes from inclination of the whole angulated position. In short turns it feels as though the feet and knees are the most active joints in edging the skis. There is also some hip angulation but, unlike the long turns, the upper body remains relatively upright.

3.1.5G. PROGRESSIVE EDGING

Progressive edging means the edge angle of the skis continuously increases as they travel through the turn and is an essential component of round turns at all speeds. The biggest edge angle is towards the end (completion) of the turn where the forces are greatest and the ski is most vulnerable to breaking away or skidding. Without progressive edging, the skier is unable to turn across the hill in a continuous radius, the turns become elongated and, as a result, speed control may be lost. This can even occur at the snowplough turning level.

3.1.6. PRESSURE CONTROL

Pressure control is an umbrella term describing the movements made to manage, control and manipulate the changing pressures involved in skiing to avoid the disruption of balance.

Pressure changes in skiing originates from two sources:

1. **Movements made by the skier (3.1.6-1)**
2. **Variations in terrain and snow conditions (3.1.6-2)**

3.1.6-1. MOVEMENTS MADE BY THE SKIER

The way our body moves to perform the skiing skills can either build pressure under our skis or take it away. Having an understanding of which body movements can build pressure and remove it is essential for smooth, balanced and dynamic skiing.

The skier can adjust their centre of mass in relation to the skis or use muscular effort to push against the snow to get a desired reaction.

These movements include:

- Up-unweighting
- Down-unweighting
- Leverage
- Foot to foot (weight transfer)
- Dynamic skill blending
- Controlled muscle flexion

3.1.6-1A. UP-UNWEIGHTING

Refers to the movement made by a skier by extending their joints. After they reach their full extension they will gain a short sensation of being light. Skiers will sometimes do this at the initiation of their turns to reduce snow contact and lessen the force between the snow and skis. This can be used to make twisting the skis easier in certain situations.

3.1.6-1B. DOWN-UNWEIGHTING

Refers to the movement a skier makes when quickly lowering their centre of mass by flexing the legs rapidly to get the same reaction of reducing the pressure between the skis and the snow. Unlike up-unweighting, the feeling of being light occurs from the start of the flexing movement until it stops.

3.1.6-1C. LEVERAGE

Refers to the fore/aft movements a skier makes to control pressure along the base of their skis to optimize the benefit from their ski design. If you shift pressure to the front of the ski, the tip will engage and bend more, which causes the ski to turn more sharply. If you shift pressure to the back of the ski the turn will straighten.

Less skilled skiers create leverage by moving the body fore and aft over the feet while advanced skiers develop 'foot sense' by using the body's proprioceptors to consciously push or pull the feet under the body to gain a more desired effect.

3.1.6-1D. FOOT TO FOOT (WEIGHT TRANSFER)

Even when a skier first learns to turn, they transfer weight from foot to foot. Most skiers do this to maintain balance while turning. The movements made to adjust the centre of mass in relation to the outside ski are considered as controlling pressure, even though angulation also relates to edging. You need angulation to edge and you need angulation to balance over the outside ski.

Why does our balance need to be on the outside ski?

- **The inside of the foot has three balance points versus two on the outside of the foot.**
- **The ski grips more on hard snow as the ankle bone is easier to align to the resultant force when rolled inwards.**
- **It is far easier for the body to make subtle adjustments to the edging when rolling the ankle inwards underneath the centre of mass and not away from it.**
- **It is more natural to jump from the outside foot to outside foot to connect turns, this is how our bodies are designed.**
- **When turning at higher speeds the outside leg is longer than the inside leg and is therefore in a stronger position to deal with forces that are created through the turn.**

It is more natural for the human body to jump to outside foot to outside foot. Therefore, it is more natural to connect turns from outside foot to outside foot.

3.1.6-1E DYNAMIC SKILL BLENDING

If a skier blends together the four skills to make a direction change, pressure will build up under the skis. Through a combination of dynamic skill blending and higher speeds, pressure can be built up to a point where the skier will need to control this pressure towards the completion phase of each turn.

A simple look at the forces at play in a ski turn can help us understand this. The centripetal force is the force from the snow that pushes the skier around a turn. As a result of this force pushing against the bottom of the ski and changing the skier's direction, the skier experiences the feeling of being flung to the outside of the turn and against the outside ski (we call this feeling centrifugal force, even though it is not technically a force).

As the skier travels through the turn, both gravity (which pulls you down the hill) and the centrifugal force line up closer to the same direction, and at the bottom of the turn they line up perfectly to produce the most amount of pressure against the ski (for a more detailed explanation refer to The Skier's Edge, LeMaster, 1999, p 37-8).

The pressure naturally increases through a steered, carved and pure carved turn. Assuming the ski performance is maintained, the two factors that can change the magnitude of this pressure during a turn are speed and radius (see physics 5.6):

- **If you go faster the strength of the pressure will be greater.**
- **If you make a shorter radius turn at the same speed the strength of the pressure also increases.**

Through a dynamic short turn pressure will build to a point where it will need to be controlled. This absorption movement can be likened to absorbing a 'virtual bump.'

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3.1.6-1F. CONTROLLED MUSCLE CONTRACTION

Controlling our muscle contractions is a way of manipulating the pressure build up between the snow and your skis during a turn.

During a steered turn, as the skis steer into and out of the fall line, the skier flexes a little and uses a controlled eccentric muscle contraction to ensure the pressure on the outside ski increases smoothly, not abruptly. This is so the ski grips and steers well.

Building pressure under the outside foot of a pure carved turn is vital to make the skis bend. Resisting the centrifugal force by isometrically contracting the leg muscles and not allowing the leg to collapse with the increased pressure of the turn, will further increase pressure under the outside ski.

Absorption (passive or active) is a movement made at the end of a turn to control the increase in pressure. This is where the skier simply relaxes the muscles of the leg (passive) or controls the eccentric muscle contraction (active) to flex the legs and give in to the increased pressure that is built up at the end of the turn.

3.1.6-2. VARIATIONS IN TERRAIN AND SNOW CONDITIONS

There are considerable pressure changes acting on a skier when skiing in the moguls beyond a certain speed. A large range of retraction and extension, as well as a subtle fore/aft movement of the feet, is required to absorb bumps and maintain balance. The first stage of absorption is a controlled eccentric contraction as the muscle lengthens and the joint flexes. The second stage is where the muscles are concentrically contracted to extend the legs and keep the skis in contact with the snow.

If the body doesn't react to manage the pressure changes from terrain then we can experience increased or decreased pressure under our skis. For example, hitting a bump at speed could make you feel light for a moment as you lose contact with the snow, effectively unweighting the skis (removing the force that is reacting between your skis and the snow).

Moving the feet fore and aft is also used to handle the sudden pressure changes from the terrain, such as skiing from the groomed into powder or crud and vice versa. Skiing from the groomed into powder the feet are pushed ahead to avoid lurching forward when the skis suddenly slow down as they hit the powder. This is quite different to just leaning back.

SUMMARY

It is important that you fully understand the individual skills and how they are blended appropriately for different turns, terrain and snow conditions.

- **Skiing slowly seems to require less pressure control, as the subtle changes in the force between the skis and the snow throughout the turn is lower and therefore harder to feel.**

Within the whole range of turns there are examples where one of the skills is emphasised less or even removed all together. For example:

- **Pure carving is performed without applying an active twisting force to the skis from the muscles in our body. However, the muscles in the core need to work harder to help stabilise the body and prevent it from turning with the skis and legs.**

3.1.7 PHASES OF A TURN

It's vital to have an intricate knowledge of all four skiing skills and how the body moves to attain them. To piece these individual movements together into round flowing turns it will take an understanding of what your body and skis have to do at each 'phase' in the turn.

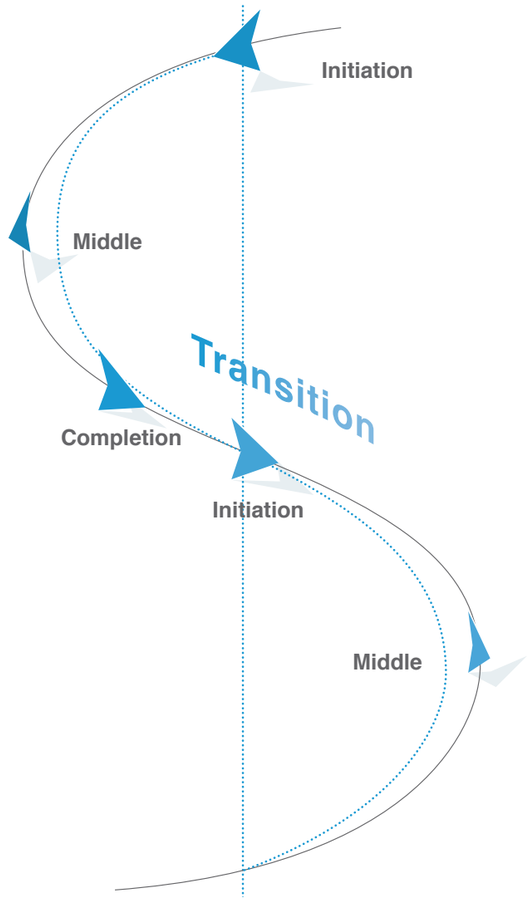
In this section of the chapter we will study linked turns by breaking them down into easy to understand sections or 'phases'. Linked turns are arcs made on the snow in the rough shape of two semi circles or the letter 'S'. Recreationally they are made to control speed while descending down a slope and to change a skier's direction of travel. Each individual turn, has an initiation or starting point, middle and completion to the turn. To link the arcs together these individual turns need to be connected. Joining the completion of one turn with the initiation of the next is called the transition.

Turn initiation (Used to establish an initial steering angle)

Turn middle (Create a 'BP')

Turn completion (The end of the arc where you stop the turning force)

Turn transition (Seamlessly connecting the completion of one turn to the initiation of the next)



CHAPTER THREE: Technical Concepts

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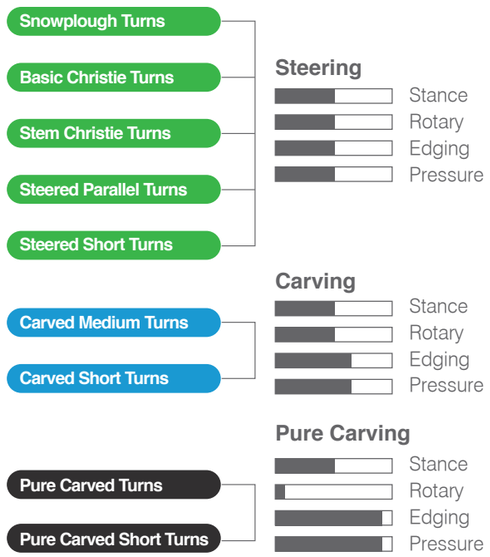
SECTION TWO:

THE PERFORMANCE MODEL

By looking at the interaction between the skis and the snow during different types of turns we can gain a better understanding of the body movements necessary to produce them. The 'performance model' classifies five different interactions giving us a spectrum of different turns. This spectrum will help you gain more knowledge of how to perform a variety of skill blends at different speeds to produce a desired ski/snow outcome.

Ski Performance

- Steered turns
- Carved turns
- Pure Carved turns
- Skidded turns
- Railed turns



There are five distinct performances a skier uses to change their direction as outlined above. Although the performances of skidding and railing can be useful in certain situations, they are not the most desirable outcome of a student in the Australian Teaching System. Therefore, we have given descriptions of the skidded and railed turns but looked more in depth into the movements required to create the desirable performances of steering, carving and pure carving.

3.2.1. SKIDDED TURNS (SKIDDING)

A ski performance used by a lot of inexperienced skiers with too little edge angle. What it means is; 'the ski is sliding sideways rather than in the direction of the desired arc.' That is, in comparison with the expected ski performance for that particular turn.

Skidding may be used as a tactical performance in situational skiing. For example, skidding may be taught to skiers wanting to navigate a bump field and adjust their line by skidding down to a more appropriate place to turn. Or in the steeps to re-adjust their line or descend to a better place to turn.

3.2.2. RAILED TURNS (RAILING)

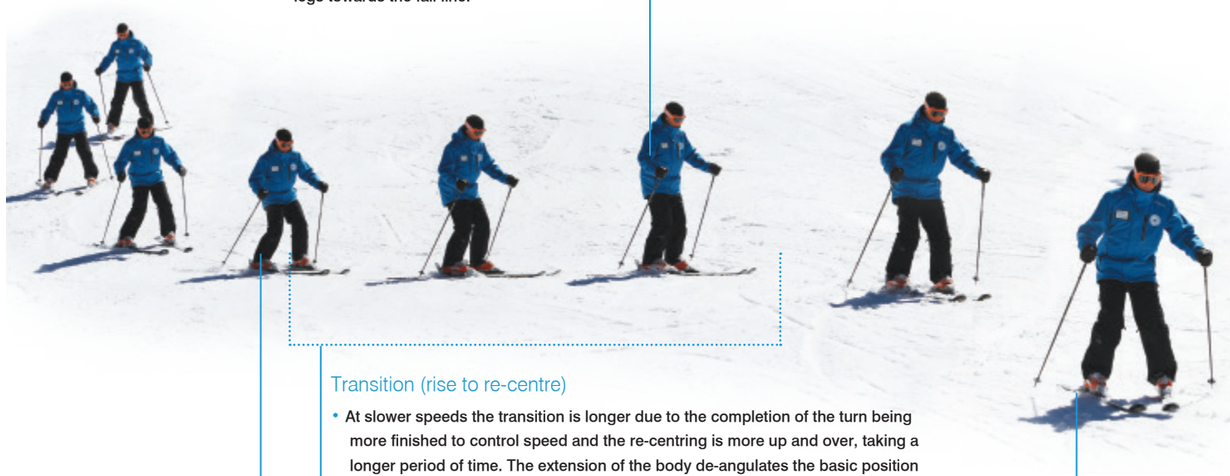
In a railed turn the skis are tilted and either the outside ski or both skis are locked on the edge all the way around the turn, with zero skidding (like on a railway track). The tail of the ski follows the exact path of the tip while the ski cuts a narrow groove in the snow. The side-cut of the skis determines the radius of the turn. Railing is used as an exercise to achieve pure carving. It is a useful tool to teach students about using the skis side-cut and design. But, is also used to explain over-edged skis at slower speeds or turns used by inexperienced skiers trying to pure carve.

3.2.3. STEERED TURNS

Steering - is the art of guiding the skis through a smooth, round turn at slower speeds. Although this turn type has a strong emphasis on leg turning, the turn is created by appropriately blending all of the four skills together. Steering is not the same as skidding; therefore, a consistent track is left in the snow by the outside ski and will be about 30cm wide from beginning to end.

Initiation

- The skier has risen to a taller stance.
- Edges are changed to the new turning edges by a definite flattening stage.
- The steering angle is created by twisting the legs towards the fall line.



Transition (rise to re-centre)

- At slower speeds the transition is longer due to the completion of the turn being more finished to control speed and the re-centring is more up and over, taking a longer period of time. The extension of the body de-angulates the basic position causing the edges to flatten. By raising their centre of mass (CoM) the skier can re-centre their balance, enabling them to move towards the centre of the next turn. The angle of travel between the CoM and the path of the skis is only slight.

Completion

- Turns are finished in a lower (flexed) position that is balanced over the outside ski.
- Once the skier has controlled their speed they stop edging, twisting and balancing against the outside ski and begin the transition into the next turn.

Middle

- Constant twisting effort of the legs against a stable pelvis/upper body and core, results in a slightly countered position.
- Gradual tipping of the skis grips the snow and continues to give the skis direction through the arc. The edging creates a platform on the outside ski to balance on.
- Blending these skills will create a balanced basic position (BP) where the centre of mass is slightly to the inside of the turn.

Scan QR code to view content.

3.2.4. CARVED TURNS

Carving is the same as steering but with more speed, more edge angle and therefore, a stronger edge grip. Carving taps into the side cut and ski design to help with direction change but also relies on a strong twisting effort from the legs to guide the skis, breaking them off an otherwise railed path. The track left in the snow by the outside ski will be narrower than in a steered turn at about 10cm wide from beginning to end.

Initiation

- The skier extends their body while projecting their centre of mass across their skis.
- Edges are engaged early in the turn as a result of this crossover movement.
- Steering angle is created by using the legs to twist both skis towards the fall line and also tapping into the ski's local steering angle by standing against the edged ski to bend it early.

Transition (crossover)

- The transition utilises a crossover by the centre of mass, across the skis as opposed to a vertical extension, moving the skier towards the centre of the next turn. The legs flex to help control pressure built up from the previous turn. A directional movement forward and across the skis with the centre of mass achieves a higher edge angle early in the turn and sets the body up for the appropriate amount of inclination through the middle of the turn. A pole plant can be used during the transition to aid in the commitment and direction of this movement. The angle of travel between the CoM and the path of the skis is more direct.
- Balance on the new outside ski is established through the transition.

Completion

- Once the skier has controlled their speed they stop edging, twisting and balancing against the outside ski and begin the transition into the next turn.

Middle

- Constant twisting effort of the legs against a stable pelvis/upper body and core, results in a slightly countered position. The leg turning is more strenuous due to higher edge angles.
- Earlier tipping of the skis and an increased speed creates a stronger platform under the outside ski to balance against.
- Edging is progressively increased using ankle, knee and hip angulation.
- Both of these factors come together allowing a greater inclination of a balanced basic position where the Centre of mass is further to the inside of the turn in comparison to steering.

3.2.5. PURE CARVED TURNS

Pure carving is where the tail of the ski follows the exact path of the tip, allowing the ski to cut a narrow groove in the snow (i.e. the ski is locked on edge with zero skidding and no guiding of the skis via a twisting force). The skier obtains the desired turn size though using the side cut of the ski and by manipulating the external forces to get the ski to bend and therefore travel on a tighter arc i.e. 'working the ski'.

Transition (active crossover)

- The transition utilises an active crossover movement. Muscular effort is used to control the path of the centre of mass as it moves directly towards the centre of the next turn.
- Balance on the new outside ski is established through the transition.
- Flexing the outside leg from the previous turn allows the CoM to start travelling across the skis (or topple). An extension of the uphill leg from the previous turn helps project the CoM into the middle of the new turn more directly.
- This lower and more direct movement across the skis is used both to control the high pressure built from the previous turn and set the body up for higher edge angles and increased inclination through both the initiation and middle of the next turn. A pole touch is used during the transition to aid commitment to the crossover and for balance. The angle of travel between the CoM and the path of the skis is the most direct.

Initiation

- The skier actively crosses their skis in a more direct path towards the middle of the next turn.
- Edges are instantly engaged in the turn as a result of this crossover movement.
- A local steering angle is created through the side cut of the ski and some early tip pressure.

Completion

- Turns are finished in a balanced position over the outside ski.
- The turn completion occurs higher or earlier in the turn than previous performance levels as speed control is less of a priority.

Middle

- Some degree of separation occurs through internal femoral rotation by way of knee and hip angulation (this countered position is created via passive leg turning. The skis' design working the legs against a stable pelvis and upper body, not through an active twisting of the legs to guide the skis).
- Earlier and greater tipping of the skis due to increased inclination at this speed creates a very strong platform against which to balance.
- These factors come together allowing a greater inclination of a balanced basic position where the Centre of mass is farthest to the inside of the turn in comparison to steering and carving.

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CHAPTER THREE: Technical Concepts

SECTION THREE:

BASIC ANATOMY, PHYSIOLOGY AND SKIING BIOMECHANICS

This section of the manual will help provide background information on the human body and how the muscles and skeleton function as a system to create balanced movement in skiing. To both teach and ski effectively, it is important to understand the capabilities of the human body relative to movement.

To help you gain an understanding of the human body we will look at three distinct areas:

Anatomy: Is the structures of the human body and what it is made up of.

Physiology: Is the study of how the body works and what it can do.

Skiing biomechanics: Is the study of how to move your body into the best position to make and deal with the forces that we encounter in skiing.

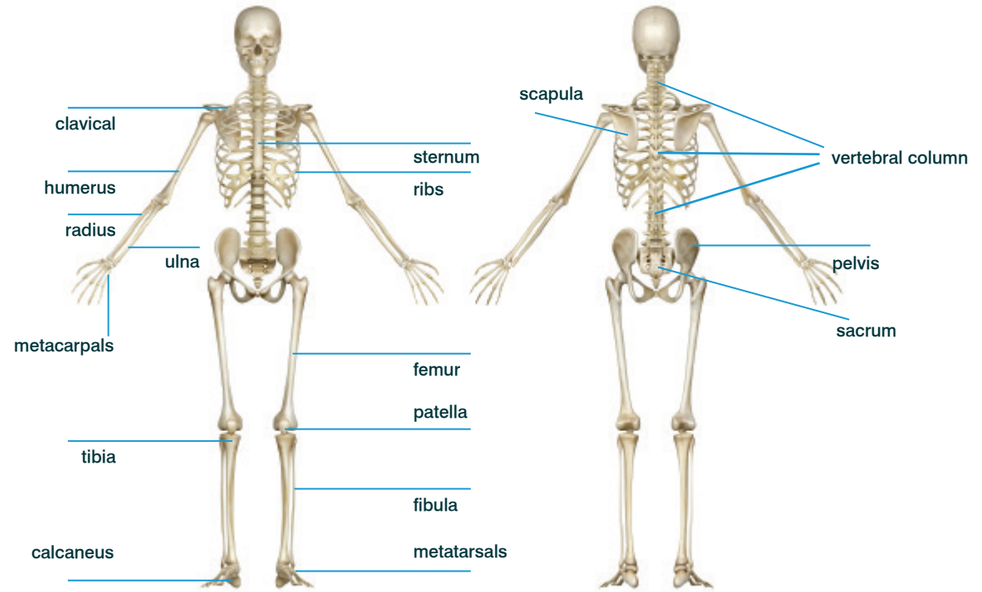
3.3.1. ANATOMICAL DIRECTIONAL TERMS

- **Medial** - toward the midline of the body
- **Lateral** - toward the outside of the body
- **Anterior** - to the front of the body
- **Posterior** - to the back of the body

3.3.2. THE MUSCULOSKELETAL SYSTEM

The musculoskeletal system consists of the bones, muscles and their tendons, joints and ligaments.

- **Bones - the rigid structures that constitute the human skeleton.**
- **Muscles - connective tissue structures with the ability to contract, thereby creating movement and generating the force required to move bones and do work.**
- **Joints - where two bones come together, also called an articulation.**
- **Tendons - the non-contracting part of the muscle that connects muscle to bone.**
- **Ligaments - connective tissue that connects bone to bone.**



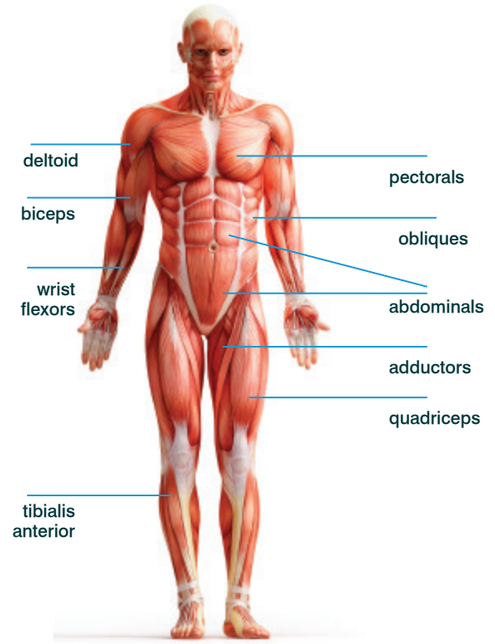
3.3.3. THE HUMAN SKELETON

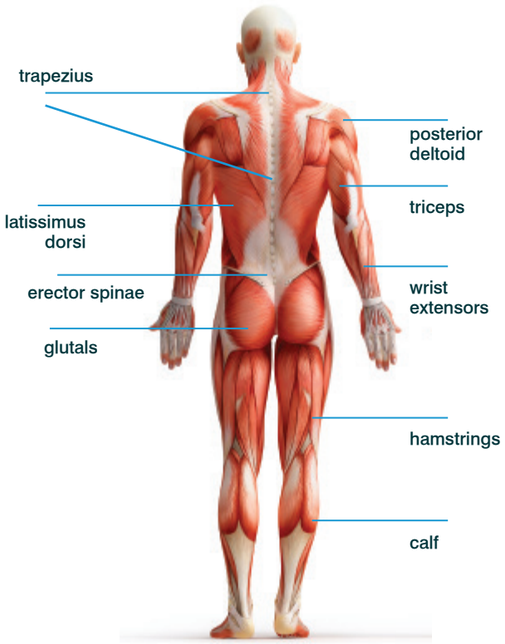
The skeleton acts as a scaffold by providing support and protection for the soft tissues that make up the rest of the body. The skeletal system also provides attachment points for muscles to allow movements at the joints.

The main bones in the skeleton are shown in the diagram above from the front (anterior) and the back (posterior).

3.3.4. MUSCLES

The function of muscles is to produce force and cause motion. The main muscles/muscle groups of the body are outlined in the following diagrams:





Most muscles function in pairs to produce movement. Muscles can only pull and cannot push. This would be a problem if a joint was controlled by just one muscle. As soon as the muscle had contracted and pulled on a bone there would no way to move the bone back. The problem is solved by having muscles in pairs, called antagonistic muscles.

A good example of this is in our upper leg. The hamstring contracts to flex the knee joint while the quadriceps (its antagonistic pair) relaxes. To extend the leg back again, the quadriceps contracts while the hamstring relaxes.

This relationship gives great control over joint movement. It can be likened to controlling your car's steering wheel. Both hands spread apart (at 10 and 2) working as antagonists to control and adjust the movement of the wheel are far superior to having them both at 12 o'clock on the steering wheel and performing the same pushing or pulling movement.

3.3.4A TYPES OF MUSCULAR CONTRACTIONS

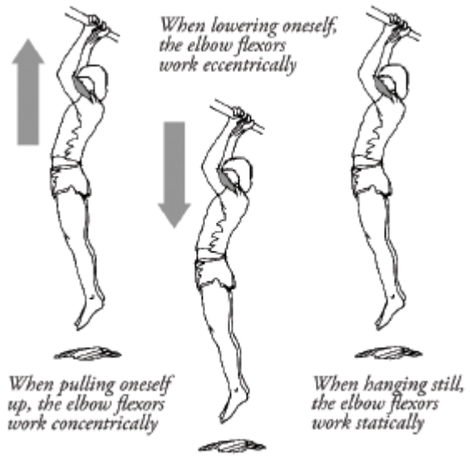
Muscles do the physical work of the human body. They work with the skeletal system to produce movement. Just as a car's engine combines with the axles and wheels to produce movement, a muscle can either contract or relax.

Contraction of the muscles does not always produce movement. Sometimes they are used to soften or control a movement in the opposite direction to which the muscle usually tightens. Here are three different types of contractions and the movement they produce:

- **Concentric contraction - when a muscle performs work by getting shorter (e.g. using the biceps to lift a weight by bending the elbow).**
- **Eccentric contraction - when a muscle performs work while getting longer (e.g. using the biceps to lower an object by straightening the elbow).**
- **Isometric (static) contraction - when a muscle performs work while staying the same length. There is no movement produced at the joint (e.g. when body builders tense their muscles while holding a pose).**

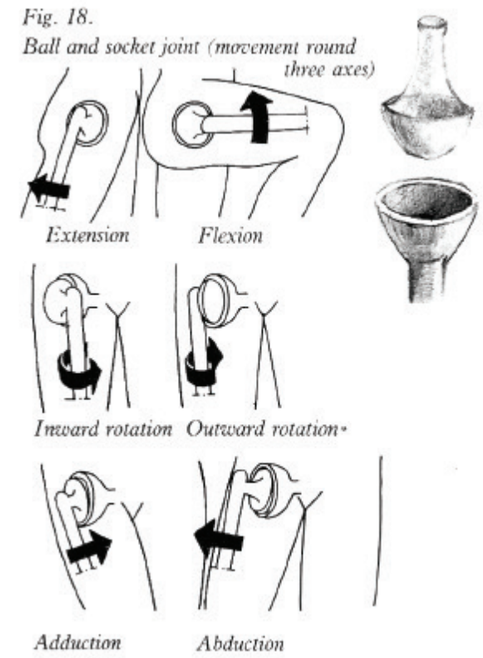
We are constantly, unconsciously using isometric contractions to stabilise the joints and maintain balance in skiing. This is one reason why most new skiers are so tired on their first day and complain of "muscles they didn't even know they had".

Hamstrings in Action



3.3.5. JOINTS

Every bone-to-bone connection on the body occurs at a joint. These bones are held together and in place at the joint by fibrous tissues called ligaments. There are several types of joints in the human skeleton that enable different ranges and planes of movement:



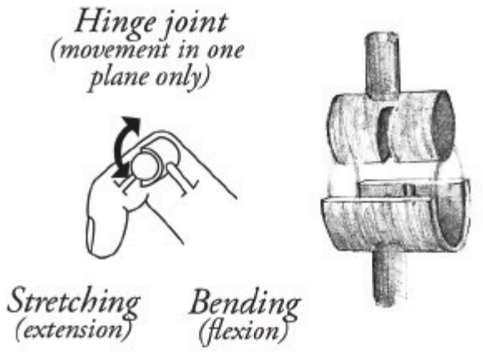
3.3.5A. TYPES OF JOINTS

Ball and socket joint (hip, shoulder)

Ball-and-socket joints allow the most movement of all the joints. One bone (such as the femur) has a ball-like knob at the end of it. This knob fits into a cup-like space on the other side.

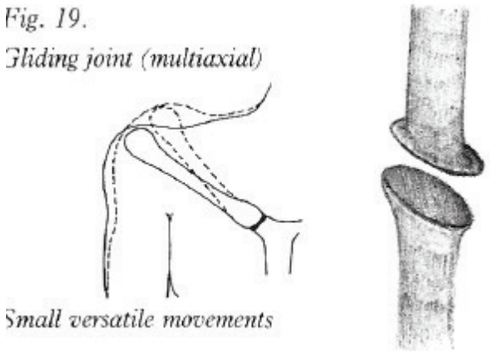
Hinge joint (elbow, knee, ankle)

Hinge joints allow bones to move back and forth (such as in the elbow and knee). It allows the bones to move like a hinge in a door.



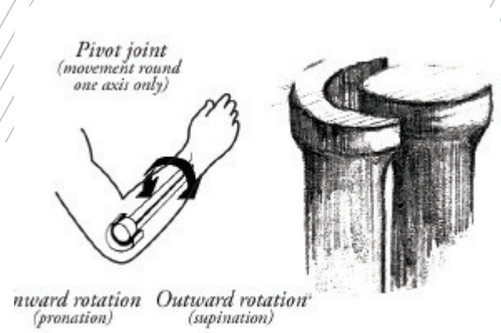
Sliding joint (vertebrae, tarsals, carpals)

Sliding joints are found in the vertebral column and allows small sliding movements. The vertebrae have pads of cartilage between them and the bones slide over these pads. This is what makes the backbone so flexible.



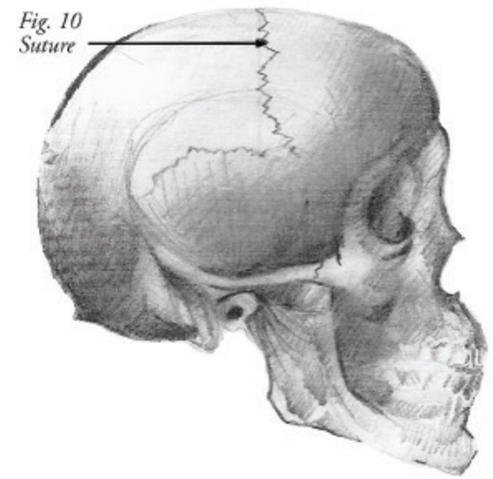
Pivot joint (forearm/radius head)

Pivot joints allow movement from side to side. Your forearm can move at the elbow to lift objects via the hinge. It can also rotate by using the pivot joint between the radius and ulnar heads.



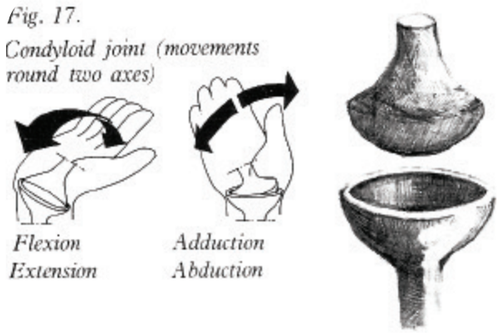
Fixed joint or suture (joints in skull)

This is the one joint that does not allow any movement at all. Interestingly, when babies are born their skull bones are not joined together yet and this soft spot (fontanel) is actually a gap. The bones then quickly grow together to protect the brain.



Condyloid joint

Allowing movement around two axis such as the wrist joint.



3.3.5B. TYPES OF JOINT MOVEMENTS

Flexion: Bending parts at a joint so that the angle between them decreases and the parts come closer together (bending the leg at the knee). Similar to lowering your skiing stance.

Extension: Straightening parts at a joint so that the angle between them increases and the parts move farther apart (straightening the leg at the knee). Similar to when your skiing stance gets taller.

Abduction: Moving a part away from the midline (lifting the leg away from the body to form an angle with the side of the body). This is a movement that helps contribute to hip angulation.

Adduction: Moving a part toward the midline (returning the leg from being away from the body to align with the body). When we roll our flexed leg inwards to gain knee angulation we are adducting the upper leg.

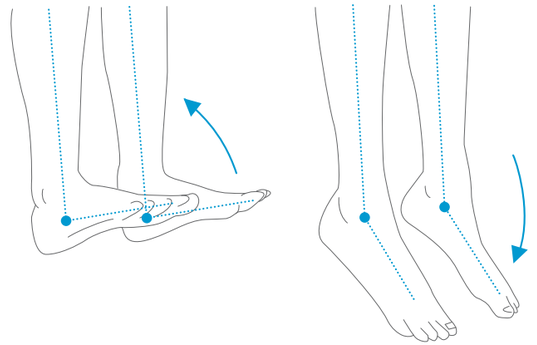
Rotation: Moving a part around an axis of a bone (twisting the head from side to side, turning the whole leg from the hip joint). When we turn our legs in skiing the femur rotates inside the hip joint.

Circumduction: Moving a limb in a circular manner, this requires a combination of flexion, extension, abduction and adduction. The ball and socket joints of the hip and the shoulder are two of only a few joints that are capable of circumduction

3.3.6. FREQUENTLY USED JOINTS IN SKIING

The ankle joint

This is an important joint in skiing because it joins the two bones of the lower leg (tibia and fibula) to the talus bone of the foot. It is a hinge joint, which can move the foot down (plantarflexion) and up (dorsiflexion). When the lower leg is moved onto the boot tongue while skiing, we are dorsiflexing our ankle.

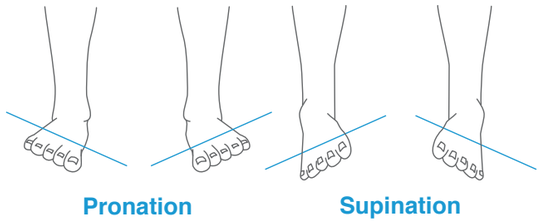


The foot

The rest of the movements of the ankle and foot - twisting, tipping and side to side motion - occur in the complex system of bones in the foot and in the subtalar joint in combination with the muscles, tendons and ligaments in the ankle. This allows the movements of:

Pronation: Turning the foot so the sole faces outward or laterally (big toe side rotates down). We use this motion constantly when edging the outside ski and gripping the snow.

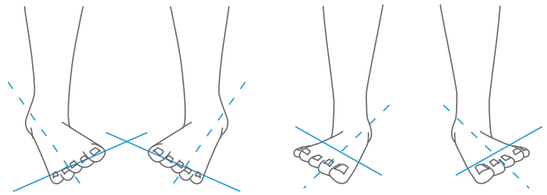
Supination: Turning the foot so the sole faces inward or medially (little toe side rotates down). When teaching parallel turns we teach students to feel this motion so they can release the inside skis edge to transition simultaneously.



Eversion: Involves turning the sole of the foot outward. It combines lateral rotation (toeing out) with pronation (rotating the little toes side of the foot upward)

Inversion: Involves turning the sole inward combines medial rotation (toeing in) and supination (rotating the big toe side of the foot upward)

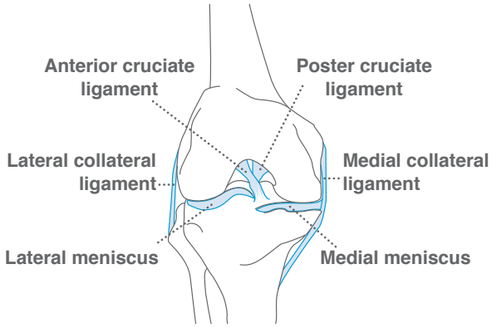
These ankle movements are critical to good skiing but they are restricted by our tight fitting ski boots. Most edge control movements in skiing should still begin in the ankles though and ankle tension is essential to making the skis hold.



Inversion Eversion

The knee joint

As a hinge, the knee joint has normal ranges of movement for flexion and extension, although a very small amount of rotation and lateral movement is also possible. Flexing and extending our knees is vital when performing pressure control movements or even adjusting the height of our basic stance. Sometimes we feel like we are rotating our knee joint when making turns but the hinge nature of this joint proves this to be incorrect. It is more likely that you are feeling the knee point in the direction of the turn by rotating the whole knee structure using the femur at the hip joint.



Hip joint

The hip joint has normal ranges of movement of flexion, extension, abduction, adduction, medial rotation and lateral rotation. The hip joint offers us a vast degree of movement in all different directions. We use the hip joint from turning our legs in a short turn, to helping with hip angulation for edging and balancing on the outside ski in a dynamic long turn.

To enable the best movement from the hip joint for all of the skiing skills, there must be flexion at the joint. Varying amounts of flexion can be used for different situational skiing tasks (e.g. less for dynamic moguls, more for pure carved long turns). However, if no flexion is created, it can have a detrimental effect on both the skills and the body, for example:

- **Rotary: Leg turning range is minimised and weakened.**
- **Edging: Hip angulation is more difficult and can lead to spinal angulation.**
- **Pressure Control: The joint will not collapse/flex as easily when managing pressure from terrain etc.**
- **It can place added stress on the skier's lower back.**

a) Shows an athletic stance with good flexion at the hip joint and the pelvis tilted anteriorly.

b) Is an example of a stance that displays a posterior tilt of the pelvis where the sacrum/coccyx is "tucked under".

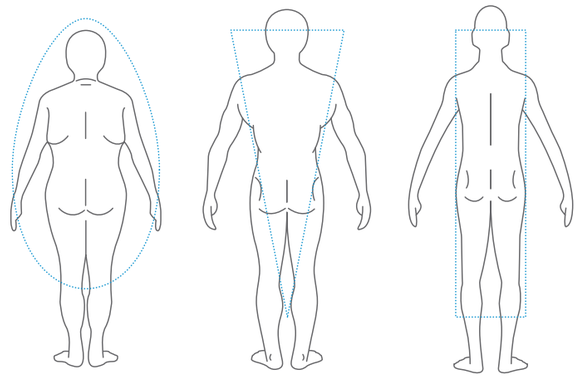
c) Shows a neutral pelvis with no flexion at the hip joint.

Spinal column

The vertebral column has normal ranges of movement of flexion, extension, lateral flexion and rotation. It's important to note that we try not to use our spine for gross, powerful movements in skiing. However, it does allow a degree of movement that helps in corrective movements such as stability and balance in our skiing.

3.3.7. BODY SHAPES

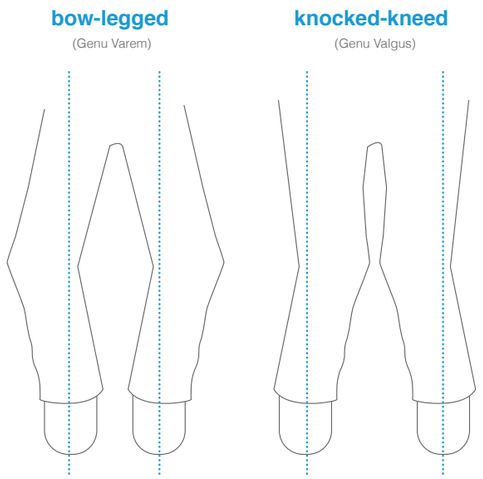
There are three basic body shapes and these are depicted below:



Endomorph Mesomorph Ectomorph

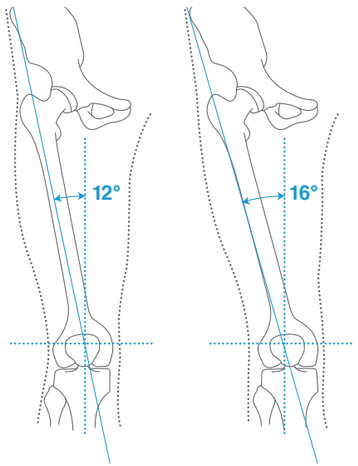
3.3.8. BODY ALIGNMENT

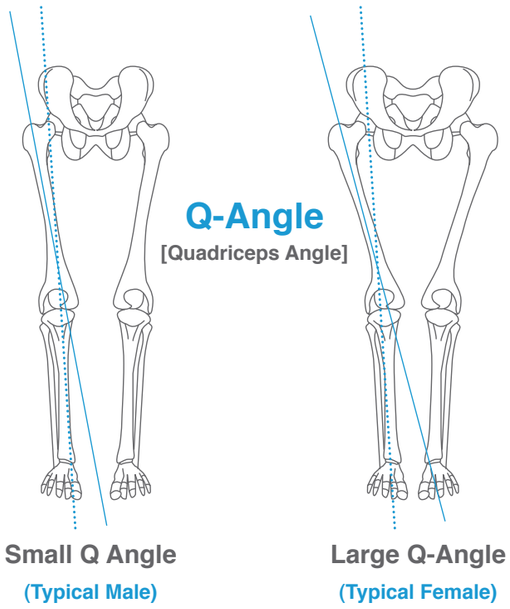
The shape of the bones, hip, thigh, shin and ankle all affect how people stand (and therefore ski). Their posture and core strength may also determine the way a skier's body aligns to a normal square position.



3.3.9. Q-ANGLE

Q-angle is an abbreviation for 'quadriceps femoris muscle angle'. In simple terms: it is the angle between an imaginary midline drawn down the thigh crossing the patella and the actual midline of the femur. The average angle for men is about 13' and 18' in females; this angle increases in women due to a wider pelvis.





CHAPTER THREE: Technical Concepts

SECTION FOUR:

SKIING PHYSICS

Skiing physics is the study of the forces that we encounter in skiing. Understanding the forces helps us understand the mechanics of skiing, which in turn helps us teach the sport more simply and clearly. Think of skiing physics as 'the why'. It is the reason why we have to do what we do when we ski.

3.4.1. NEWTON'S LAWS

Understanding these three basic laws of physics can help you predict and even manage the actions of your skis on the snow. Sir Isaac Newton described these laws, which affect all types of motion as:

1. **An object at rest will remain at rest unless acted on by an unbalanced force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by an unbalanced force. This law is often called the law of "Inertia".**
2. **Force equals mass times acceleration (F = ma). The net force on an object is equal to the mass of the object multiplied by its acceleration.**
3. **For every action there is an equal and opposite reaction.**

Although it was Professor Richard Feynman who said "*Newton's laws...say pay attention to the forces. If an object is changing speed or direction, some agency is at work; find it*".

This is really what is important to us as skiers as we need to look at the 'agency' or forces that affect us when we are skiing or riding.

3.4.2. WHAT IS A FORCE?

A force is simply something that pushes or pulls on an object.

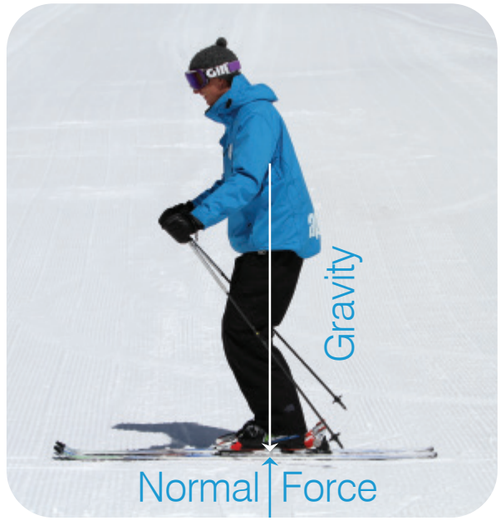
First we must divide the forces in skiing into two categories: internal and external forces.

- **Internal forces are those the skier generates with his muscles, as in biomechanics.**
- **External forces are those that act on the skier from outside the body, these are the forces we will look at in the physics section as they are the only forces that can change the skier's motion. These include gravity, normal force, centripetal force (while turning), wind resistance and snow friction.**

3.4.3. THE THREE MAIN FORCES THAT AFFECT US:

3.4.3A. GRAVITY

This is the skier's engine. Because gravity pulls us toward the earth's centre we have a tendency to slide downhill. The steeper the hill the faster we go.



3.4.3B. NORMAL FORCE

This is the force directly opposing gravity.

This force comes from the snow resisting against the bases of our skis to stop us being pulled towards the centre of the earth. In powder we sink into the snow until it packs hard enough to directly oppose gravity.

3.4.3C. CENTRIPETAL FORCE

When a skier wants to turn, a force needs to push on the base of their edged skis to change their direction. When this force is constantly changing direction we achieve

Centripetal Force

an arc or turn. This constantly changing force is called centripetal force. Centripetal force always pushes at 90 degrees to the base of the edged skis. It is a centre-seeking force meaning it is always directed to the centre of the turn.

3.4.4. FORCES THAT HAVE LESS EFFECT:

3.4.4A. SNOW FRICTION

This is the friction between the snow surface and the bottom of the skis. Different types of snow produce different amounts of friction. When we stand on a ski slope, we will not start to slide until the steepness of the slope allows gravity to overcome the snow friction. In general, this resistance is fairly negligible if our skis are waxed and maintained properly (see ski tuning 8.2.2).

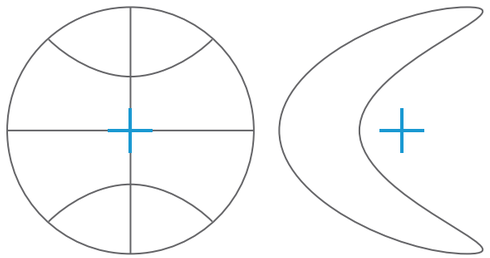
3.4.4B. WIND RESISTANCE

This is the ability of the air to resist or slow us as we pass through it. The faster we go, the greater the resistance. This becomes important when racing but fairly negligible when dealing with recreational skiers.

3.4.5. OTHER USEFUL CONCEPTS/TERMS IN SKIING PHYSICS INCLUDE:

3.4.5A. CENTRE OF MASS

The centre of mass (CoM) is the point at which all the mass of a body is considered to be focused. If you throw an object into the air, it is the point about which it spins. The centre of mass can either be inside the body like in a basketball or outside the body like on a boomerang. Remember that children have a larger head in proportion to their bodies, which means their centre of mass will be located higher than that of an adult. Think of balancing a broom horizontally on your finger somewhere along the handle. The balance point is closer to the broom head if the head is larger.



3.4.5B. COMBINING FORCES

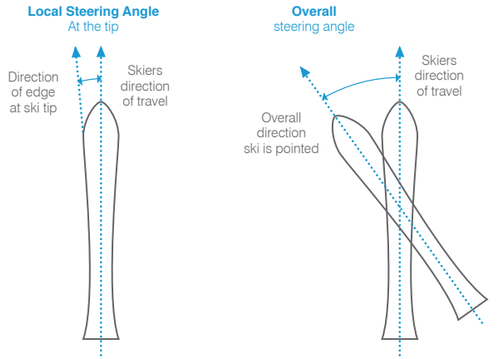
When two or more forces act on a person's centre of mass, we can combine the two forces to result in one force which makes it easier to understand and draw. It is called the 'resultant force'.

3.4.5C. ANGULAR MOMENTUM

A term used to explain the speed at which someone spins when flying through the air, like a free rider performing a 'D Spin'. All of the angular momentum is created before take-off.

3.4.5D. STEERING ANGLE

Before you will turn, your ski must turn. It must have a steering angle for a force to act on it and for you to travel around the corner. All skis have a 'local' steering angle and the angle's size is dependent on the depth of the ski's side-cut and overall length of the ski. The skier can also create a steering angle by applying a twisting force to the ski to allow turning to occur.



3.4.5E. TOPPLING

Toppling is caused by an unbalanced force. When we turn, a force (centripetal) pushes against the base of our skis towards the centre of the turn. In order to keep from falling, we must balance the centripetal force by leaning into the turn. This leaning in is called inclination. When we talk about inclination we refer to the inclination of the centre of mass. In other words, the more we incline, the more the centre of mass moves into the turn.

The faster we travel and/or the tighter our radius, the more we have to incline. The reason for this is explained by the equation that determines how much centripetal force is created during a turn. Force is proportional to mass times velocity (squared) divided by radius.

$$F \propto \frac{m v^2}{r}$$

By understanding this equation, we can see that if we halve our radius, we double the force. If we double the speed (velocity), we quadruple the force. As the centripetal force increases, we have to incline more to remain in balance.

In order to topple or move into a new turn by crossing the skis, a skier must unbalance the equation by either making the centripetal force greater or allow the centrifugal force to win. Centrifugal force is the force you feel pulling you out of a turn e.g. when playing corners in a car. It is not a true force in a physics term and therefore cannot be increased alone, but we do talk about it due to the fact that you can feel its result.

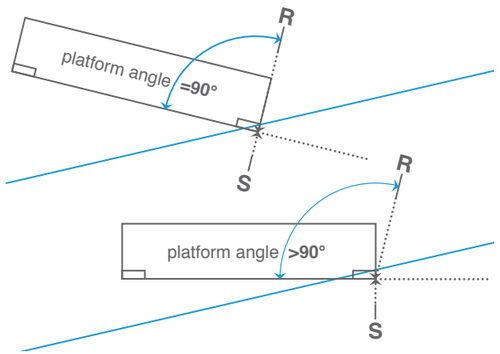
Ways to topple into a new turn are:

- **Stemming the new turning ski under our body** and then applying turning force to it. Our centre of mass does not topple as such but our feet/skis move under our body. Because stemming does not require as much of a commitment to falling across the skis or the understanding of how much/fast to fall into the new turn, this is a simpler and more stable way for a new skier to move into a new turn.
- **Slowing the skis down** will cause the centre of mass to crossover the skis. This can be achieved by turning the skis in a tighter arc (like a pre-turn), increasing the edge angle (like in an edge set) or by hitting a bump.
- **Pressing on the uphill ski** will change the relationship between your centre of mass and your base of support (whichever ski you are standing on) thereby causing the skier to crossover their skis.
- **Absorbing or relaxing the core and leg muscles,** whether it is active or passive, will stop the effect of centripetal force effectively allowing gravity and centrifugal force to win. As a result, your centre of mass will follow a straight line and crossover the path of your feet.

Thank you to Ron Le Master for his help on this section over the years.

3.4.5F. THE SKIS PLATFORM ANGLE

For the snow to push back against us enough to make us go around the corner it also needs something to push against i.e. the base of your ski. We also need to determine how much is enough angle for the ski to be able to efficiently penetrate the snow i.e. cut a step and gain enough push back to get the skier around the desired arc.



The platform angle is the angle between the skier's resultant line of force and the base or the base edge of the outside ski. If this angle is greater than 90 degrees then the ski will slip. When this angle is 90 degrees or less the ski will hold (no sideways slipping).

This angle is important to understand when teaching because with too much edge angle it is impossible for a new skier to make a steered turn. Conversely, if an advanced skier has overly beveled skis they may appear to have sufficient edge yet will still be slipping while trying to carve.

SUMMARY

A deep understanding of all the separate parts in this chapter will help you better understand, feel, explain and analyse skiing.

Remember though, the guest does not need to know all the physics and biomechanics of skiing to have a good time. Even if you use small parts to aid your explanations, it is really the simple breakdown of skills and how they relate to the desired performance that guests need to help them improve. Your skill of putting it all into easy to understand segments is the secret to teaching the mechanics of skiing.

CHAPTER 3: REVIEW

Technical Concepts

1. **List and explain the four skiing skills in your own words.**
2. **Write two analogies to explain the correct stance.**
3. **What does leg turning allow you to achieve?**
4. **What would happen to a turn if we did not edge?**
5. **What two things do we have to combine to create hip angulation?**
6. **What is pressure control?**
7. **What three sources can change pressure in skiing?**
8. **What are the four phases of the turn?**
9. **Why do we angulate our body to help with:**
   a. **Edging?**
   b. **Pressure control?**
10. **What is basic anatomy and what does physiology look at?**
11. **Explain in your own words the three basic body shapes.**
12. **Why is the hip joint a good joint to use for turning?**
13. **What is a force and what are the three main forces that affect us in skiing?**
14. **List the four ways to topple into a turn.**
15. **List the three ways muscles in the body can contract. Give one example for each that we use in skiing.**

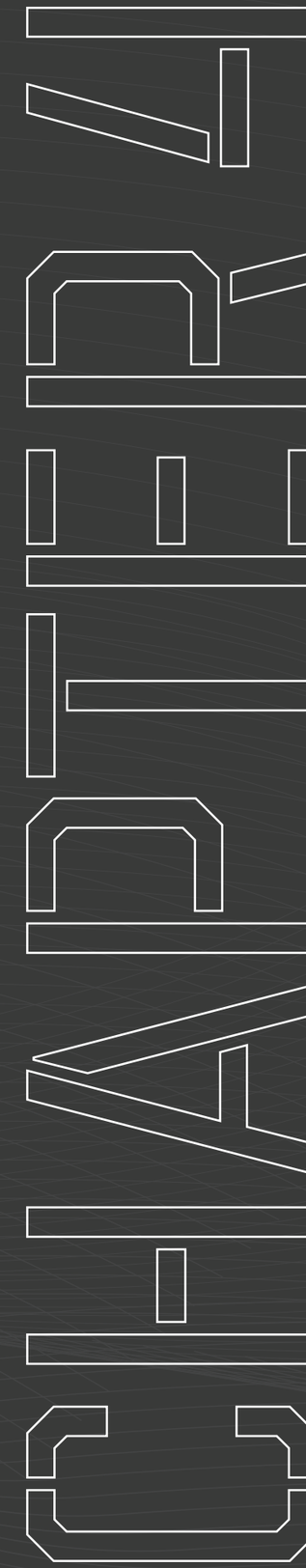
3.4.5

TECHNICAL CONCEPTS

About this chapter

Teaching children to ski can be an incredibly rewarding experience. Kids can be very impressionable and their ski instructors can have a dramatic impact on how they enjoy their experience in the mountains. Giving them a fun, memorable experience can have a lasting effect and inspire them to become lifelong snowsport enthusiasts.

This chapter should be used in conjunction with the others in this manual to provide the information on how and what to teach. Use the information contained in this section to adjust your lesson to suit the specific needs of children.



CHAPTER FOUR: Teaching Children

When teaching a children's specific lesson there are 'three fundamentals' that must be followed.
These fundamentals are:

4.1. **Safety**

4.2. **Fun**

4.3. **Learning**

A successful children's instructor is one who runs a lesson that is safe (with a set of fair, clearly laid out rules), fun (including a theme or analogy that relates to the child's interest) and where the learning process is adjusted to suit their developmental level.

4.1. SAFETY

As children can be less aware of the consequences of their actions, safety should be the primary concern. The wellbeing of the students in your lesson is your responsibility as their instructor. For children to learn effectively they must feel safe and secure in their environment.

In the following safety section we will provide you with some useful tips to help with class handling and behavior management when it comes to a children's lesson.

4.1A CLASS HANDLING

A well-organised kid's class will not only be a safe class, it will also be a successful class. Following are some useful hints designed to help develop the way you handle a children's class.

1. Establish class rules

If you set out a clear plan of what you expect early in the class you will often avoid behavioural issues.

Below is an example of such a plan:

- **Determine a set of rules, consequences and check for understanding.**
- **Praise appropriate behavior.**
- **Include the group when discussing inappropriate behavior and decide on an alternative that is acceptable to everyone.**
- **Always re-establish group rapport.**

2. Practise effective communication

Establish a caring/trusting relationship with all the children in your class and make sure they remember your name.

- **Talk with children, not at them.**
- **Listen actively, try to understand their perspective.**
- **Be fair and consistent.**
- **Be positive and encouraging.**

3. Make eye contact with each child frequently

- **Get down to the child's level; kneel or bend down if necessary.**

4. Establish team bonding

- **Create a fun environment and encourage group culture.**
- **Make up a team name, let the children help you do this.**
- **Develop trust and respect.**

5. Instructor should go first.

- **Follow the leader until children are familiar with the trail and surroundings. This depends on the age, instructor's knowledge and your confidence in the class.**
- **When children go first, have clear directions as to the stopping location or "landing pad". Use repetition when stopping on the hill i.e. the same place each time.**
- **When possible, use large/ colourful/ obvious landmarks because abstract instructions can be difficult to follow, avoid distance measures e.g. 50 metres.**

6. Have a plan when someone falls.

- **Use a 'wipe-out' rule.**
- **Have a 'ski patroller' (attach 'prestige' to this position).**

7. Have a plan if someone gets lost.

- **Establish the ground rules early.**
- **Tell your group where you are heading.**
- **Establish a meeting place if someone gets lost.**
- **Know your resort policy and procedure for the event of a lost child and follow it.**

8. Teach children to stop below the group when re-gathering.

- **Park your car in the garage.**
- **Explain the domino effect.**

9. Always be in line of sight of your class.

10. Always count your children.

- Assign each child a 'buddy' they are responsible for.
- Give each child a number and have them 'number off' every time you stop.
- Rotate the children through the line so that every child has a turn in every position of the line i.e. first, second... last.

11. Encourage spatial awareness.

- "Casper the Friendly Ghost". Imagine there is a ghost between each student. You can also use "elephants" or "tickling monkeys."
- Use "magic bubbles" and take care not to pop them.
- Encourage the children to be aware of their 'skiing space' when skiing in a class line.

12. Teach your children how to recognise you in a crowd.

- Boot colour, helmet colour, goggle colour, hair style or anything obvious.

13. Basic end of day questions.

Use repetition to ensure children know the what, where, when, why and how.

- What's my name?
- What did we learn today?
- What are we going to do tomorrow?
- Where are we meeting?
- Who's coming back?
- Who had fun today?

4.1B BEHAVIOUR MANAGEMENT

During a children's lesson there are times when the instructor may need to manage the behaviour of their students. Children's behaviour can sometimes have a negative effect on the learning environment or even become a safety hazard.

Behaviour management is one of the more challenging aspects of teaching children. It is important to remember that it is the behaviour that is inappropriate, not the child.

In most cases, if the lesson is catered to the correct developmental stage and is interesting and fun, then you will not have behavioural issues. However, if an issue does arise, here are some steps for problem solving:

1st Understand why

2nd Develop appropriate behavior

The first step towards solving an issue is gaining an understanding of why the behavior is occurring.

Some reasons for inappropriate behavior may include:

- **Hungry, thirsty, cold, tired, ill, poorly fitting equipment or the need for a toilet break.**
- **Stress from this new situation/environment.**
- **Stress from performance expectations.**
- **Developmental issues, physical problems/ frustrations due to a hormonal imbalance or disability.**
- **Cultural differences.**
- **YOU….Were your instructions clear? Have you set ground rules? Are you favouring others? Is your behavior contributing to the child's behavior?**

The only true way to answer 'why' there may be an issue is to get to know the child and care about solving the problem.

After finding out why, you will need to work on a plan for developing appropriate behavior. There are many techniques for altering the behavior of children, following are a few examples:

Talking it out: Let the child tell, describe or shout about what it is that is disturbing them. Listen, but don't interrupt or pass judgment. When possible summarise the problem and discuss a solution.

Rationalise: Explain to the child why the behaviour is not appropriate.

Reiteration: Have patience, state and re-state what you want the child to do in a calm voice**.** Becoming annoyed can cause frustration and a battle of the minds, which you may not win.

Planned ignorance: Some behaviour is designed to get your attention be it positive or negative. Give no response to the child so that they have to choose a new behaviour.

Positive role model: Lead by example.

Distraction: Take the attention of the group away from the behaviour.

Interpretation: Let the child know you understand.

Humour: Make the group laugh to ease the tension but not at the child or their behaviour.

Non-verbal disapproval: Make a gesture or facial expression to indicate to the child your disapproval or as a sign to stop. The 'zip it' gesture is a good one.

Re-structure: Remove the child from the class and from the attention, not as a punishment, but as a quiet time to think about why their behaviour is not appropriate.

Sitting with the child: Adult presence can be re-assuring and sometimes enough to correct and restore the situation.

Permission: Sometimes when you say it is OK the bad behaviour becomes less attractive.

Follow-up: Share the incident with their parents at the end of the day/lesson. By involving the parent when problem solving you will often find that you will get greater success.

Remember when dealing with children be fair, calm and consistent. Think of why the behavior occurred then how to best encourage a more appropriate behavior.

4.1C THE ALPINE RESPONSIBILITY CODE

KNOW AND OBSERVE THE CODE - IT IS YOUR RESONSIILITY

By getting children to explain the rules of 'the alpine responsibility code' in their words you will allow them to gain ownership of the process and increase the chance of your class remembering them.

4.2. FUN

The predominant reason our guests come to the snow is to have fun. Skiing the same slope in exactly the same way repeatedly becomes monotonous. Enhancing the way you present a new or repeated task will increase the interest of the children doing it.

By discovering your student's interests you can add variety and personalise the lesson for your students. This allows you to create a fun experience by tailoring the content to each child. Imagination is needed to expand on students' interests and create analogies or themes to excite them.

Relating interests to a theme or set of analogies allows you to turn ordinary exercises into FUN games. The tool we use to help turn the child's interest into an exciting adventure of learning is called 'spider webbing'.

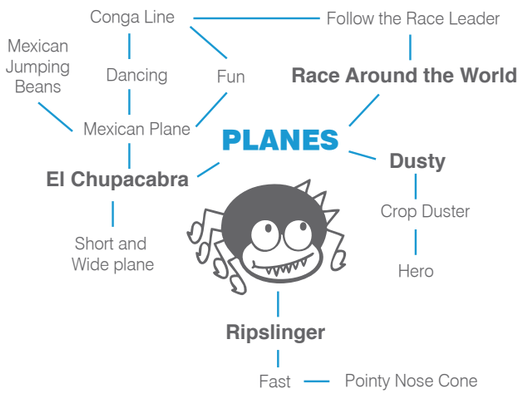
4.2A. 'SPIDER WEBBING'

is an imaginative way of connecting words via association and evolves over the lesson time through input from the group. The first step is to find out what the children are interested in.

Some examples of questions which you can use to spark the children's interest are:

- **Who is your favourite super hero? Do they have a trusty sidekick? Where do they live?**
- **What is the last movie you saw? Which character did you like best?**
- **Has anyone ever imagined that they could fly? Where would you fly to right now if you could?**
- **Do you think we might find some fairies up on the mountain? How big are fairies? What do fairies look like?**
- **What kinds of animals live in the ocean? Has anyone ever looked underwater? What did you see? If you could breathe underwater where would you go exploring?**
- **When you came to the snow did you travel by car? What did you see along the way?**

By actively listening to the responses your students give, you can start to build a library of words in your mind that relate to their interests. These words can be drawn upon during your lesson and connected to the exercises or progressions you present.



Using as many of these words as you like, the instructor can create an adventure or theme to help make your lesson presentation more exciting and more suited to the group's interests.

4.2B. SOME EXAMPLES

Below are three examples of teaching a snowplough, applied to three different age groups, showing how you can present the standard lesson in three different ways using the child's interests:

Name: Zach

Age: 4

Observation: Likes stories, own personal needs are a priority and head is larger in proportion to body.

Interests: The movie 'Planes'

Spider web: Planes- Mexican plane (El Chupacabra) - fast ripslinger - Dusty

Mechanics: Pushing their feet apart and turning their legs inwards to get the snowplough shape.

Lesson Plan: Explain to Zach that to ski as well as Dusty the plane you need to push your feet apart as wide as the Mexican plane and turn your skis into the pointy nose shape of Ripslinger.

Once Zach has the concept that this shape will help him stop he will need lots of practise before learning the next step.

Name: Tori

Age: 8

Observation: Well balanced, eager and likes friendly competition.

Interests: The cartoon 'Phineas and Ferb'

Spider web: Phineas and Ferb - drawing-platypus - school holidays.

Mechanics: Pushing their feet apart and turning their legs inwards to get the snowplough shape.

Lesson plan: Explain to Tori to take her straight skis (shaped like Ferb's head) and step them into the shape of Phineas's head (a triangle) before anyone else in the group. This is called a snowplough.

This snowplough position is for stopping so when you yell 'Phineas' she must jump into it. Now get her to brush into a stop at the bottom of the run out.

Name: Emma

Age: 12

Observation: Enjoys teamwork, dislikes being singled out and likes to practise.

Interests: Music

Spider web: Music- favorite artist 'Katie Perry'-album 'Prism'

Mechanics: Pushing their feet apart and turning their legs inwards to get the snowplough shape.

Lesson plan: Talk to Emma about her favourite music and artist, when it is time to stand in the snowplough position tell her that it is easy to remember because it is the same shape as her favorite album 'Prism'.

This snowplough is the beginning of learning to stop and eventually turning. Now have her practise gliding in the prism shape to work on strengthening the snowplough.

4.3. LEARNING

In order for children to learn a new skill there are some basic needs that must be met or the child's motivation will diminish and inhibit the learning process (as outlined by Maslow in his Hierarchy of Needs). In simple form these include:

- **Being hungry, thirsty, cold, tired or need a toilet break (it is impossible to concentrate if this is on their mind).**
- **The need to feel safe in their environment (class handling).**
- **The need to feel as though they belong (remember to introduce everyone and create a team atmosphere).**
- **The need to be given recognition for a job well done (set realistic goals).**

When all these needs are met, a child will view learning as an adventure, no longer being afraid to ask for assistance and enthusiastically tackling the challenge of learning a new skill.

4.3A CHILDREN'S DEVELOPMENT

Children view their world differently to adults because of their developmental level rather than their chronological age, all children develop through three key areas:

1. **Cognitive**
2. **Affective**
3. **Physical**

To help you adjust your presentation in a manner that is appropriate to their developmental level. The stages are described below:

COGNITIVE development refers to understanding how children think and process information. Some examples include: following directions, spatial and visual awareness, logical and mathematical abilities, understanding of specific concepts and verbal/linguistic abilities. Cognitive development will ultimately decide the learning preferences of each student.

AFFECTIVE development refers to understanding how children develop emotionally and how this dictates their overall emotional state. For a child to learn most effectively it is important for an instructor to satisfy their emotional needs as it will enhance their desire and motivation level. Some examples include understanding internal beliefs and values, teamwork and sportsmanship, identity and self-esteem, humour, play, rules, competition and moral values.

PHYSICAL development refers to understanding how children move based on the stages of their physical growth. An instructor must be able to provide skiing experiences that will assist the child to improve and develop skills in relation to their physical ability. They must also understand the limitations arising from ability levels. Some examples include: fundamental movement patterns, body development and proportions, general and sport-specific strengths, overall fitness level, centre of mass, motor control (fine and gross) and sensory development (visual, auditory and kinaesthetic).

The following **C.A.P.** table outlines the differences between the developmental stages of children and highlights some of their characteristics. The chart gives age brackets as a guide, though it is important to remember that all children develop at different rates.

	3–6 years	7–10 years	11–14 Years	15–17 Years
COGNITIVE	Like to use symbols	Uses symbols extensively	Abstract reasoning and visualisation still developing	Still Developing abstract reasoning and visualisation
	Learning to read and write	Alble to read and write extensively	Enjoys being challenged	Uses problem-solving and can understand their effect
	Likes to make-up stories	Understands the diference between apperance and reality	Able to take responsibility for actions	Gaining confidence as strength and co-ordination increases
	Learing how to follow rules	Learn through concrete experience and interaction i.e. teamwork	Want to formulate their own rules	Likes to test limits
	Learn by watching and doing	Language used more than extensively to plan and remember	Self-motivated	
	Learning how to revserve direction and thoughts	Able to judge space and distance		
	Learning to judge space and distance	Able to reserve direction and thoughts		
	Egocentric	Able to sequence three-or-more tasks		
	Learning to share	Able to understand rules and conse-quences		
	Developing attention span	Often over-estimate ability		
	Things are as they seem	Able to understand things that cannot be seen		

	3–6 years	7–10 years	11–14 Years	15–17 Years
AFFECTIVE	Developing a sense of self i.e. likes to please	Strong sense of self-worth	Self-esteem is fragile	Self-esteem is fragile
	Starting to be independent	Developing positive ways of dealing with emotions	Self-concious, easily embar-rassed	Worry about what others think
	Use words to express needs and emotions	Developing an awreness of others	Highly influenced by peers	Self-concious, easily embarrassed
	Personal needs take priority i.e. fatigue	Likes to fit into a group and please others	May be overtly sensitive and emotional	Do not like to be singled out
	Not aware of others needs or wants	Easily influenced by peers	Interested in the perfection of movements	Overtly sensitive and can be emotional due to hormonal changes
	Learning to share and enjoy social interaction	Group praise motivates me	Influenced by models	Appreciated being treated like a young adult and may identify well with other teens
	Non-competitive —playing together is winning	Self-worth tied to accomplishment Becoming self-motivated Adult rules are a challenge to their own cleverness		
PHYSICAL	Head larger than body reulting in higher centre of mass	Head becoming more in pro-portion to body, resulting in a similar centre of mass	May have grown into an adult body by age 13	Body changing rapidly
	Arms and legs short but trunk is long (may effect balance)	Upper body is more able to move seperately from lower body	Girls may be taller	Growth almost finished
	Boys and girls are the same size and strength	Fine motor movements still developing	Fine motor movements developed allowing the ability to do up buckles and hold poles	Girls broadening in hips
	Have not learned left-from-right	Growth spurts begin and may effect co-ordination	Co-ordination usually refined by age 11	Boys broadening in the shoulders
	Tire easily	Like to practise in order to reach perfection	Growth-spurts common resulting in co-ordination changes	Capable of fine motor-skills
	Upper and lower body move together - no separation	Increasing strength and energy levels	Body changing rapidly due to puberty	
	Large muscles overpower smaller ones	Vision still developing (not complete until the age of ten)		
	Gross motor movements still developing			
	Arm and leg on the same side move together			
	Often balance by having hips behind ankles due to lack-of strength			
	Dominant side- left or right side much stronger or more co-ordinated			

4.3B THE NINE ESSENTIALS FOR CHILDREN

Teaching children is very similar to teaching adults, except some aspects of the 'Nine Essentials' need either emphasising or adapting to include the additional safety, a fun theme and the students' development level.

Below is a copy of that system with some highlighted points to implement in your children's classes.

1. INTRODUCTION

Names are important -THEIRS and YOURS. Use them, as it will get their attention more quickly than anything else will. Make sure they know your name, nicknames can be a fun way for them to remember your name. Do not forget to smile, something even the youngest child understands.

2. IDENTIFYING THE CHILDREN AND THEIR GOALS

Children need to be asked their goals as much as an adult. This is a good time to start asking the right questions to find out what interests the child has as well as begin to determine their development level.

It is important to remember that sometimes children's (and their parent's) goals may be unrealistic and it is up to you to educate them on what is safe and within their ability while making sure they are continuing to have fun. For example, a parent may want their snowplough turner to ski black runs all day, while working on trying to ski parallel. We know that children learn new skills on easier terrain, so in the case of a snowplough turner this means green terrain.

3. PLANNING THE LESSON

What developmental stage are they at?

What are they interested in?

Learning through play can be categorised into the three developmental areas, having a good mix of these will also increase the chances of learning:

1. **Cognitive play: the problem solving process.**
2. **Effective (social) play: the interaction between children.**
3. **Physical play: the development of motor skills.**

1. COGNITIVE PLAY (PROBLEM SOLVING)

Lesson should provide a range of choices offering the child opportunities to make decisions and test out their consequences in a controlled situation i.e. how many turns in a given area. Do not just tell children how to do an exercise; let them have a choice of going over, around, through or jumping objects, allowing them to utilise the terrain.

2. SOCIAL PLAY (ROLE PLAYING)

Through role-playing, children test personality constructs with which they are most comfortable and carry them, as well as the ability to work and play with other children, into the real world. Allowing children to act like monsters, kangaroos or superman while learning a snowsport will stimulate the child's imagination.

3. PHYSICAL PLAY (CHALLENGE AND TESTING)

Children are constantly testing their physical powers and discovering their limitations. If your lesson doesn't provide sufficient challenge, the child will be bored, whine and maybe seek challenges elsewhere e.g. wander from the class. At the same time the instructor must be aware that although children are a bundle of energy, they tend to use this to its limits, then drop. So be aware that they have limited strength. Physically demanding exercises cannot be done repetitively without rest i.e. skating or walking uphill.

INSTRUCTORS TIP:

A children's group lesson is a common place to have skiers with a disability join your group, adults tend, more often, to take a private lesson. To most effectively include children with additional needs, some important planning is required:

1. **Talk to the child first and endeavour to understand their specific needs.**
2. **Talk to parents, carers and significant others.**
3. **Talk with other instructors to gain information from experience.**
4. **Research information about the impairment.**
5. **Try to understand what skills the child possesses.**
6. **Use the tools laid out in chapter 8 to help teach a successful lesson.**

4. PRESENTING INFORMATION

Communicate with the children at their level of understanding. Be aware of the age group you are teaching and do not be afraid to 'get down' to their level cognitively, affectively and physically. Crouching down to achieve eye contact at their level will show the children you are approachable and interested in them. Choosing the correct language (their slang) and not just using "baby talk" will let them know you are talking to them and interested in communicating with them.

As with adults, it is just as important to tell children:

What you will be teaching? E.g. first timer, today we will learn how to stop.

Why you are teaching this? E.g. because we want to avoid hurting ourselves and we want to explore more of the mountain.

How they are going to attempt it? E.g. we are going to spend some time here on the flat area and practise a snowplough.

5. DEMONSTRATING

Correct demonstrations and plenty of repetition are important as children 'copy' what they see. Children learn predominantly by watching, so often what you say will be lost. Keep in mind you are taller, heavier and have longer skis so your radius and turn shape will be different from the children. You need to modify the way you ski to match the children at all times.

6. PRACTISING

Mileage and the chance to practise newly learnt skills are important for children. Vary the images, games or exercises as you consolidate a skill. While some students are consolidating, others may be learning more so keep exercises new, varied and challenging for all students.

We would suggest writing down all the ideas and exercises you invent out on the hill on a note pad. Keep a record of these ideas and any that you 'hijack' from other instructors in your jacket for quick references.

Here are also some suggestions on how to explain straight running exercises and the snowplough position to children:

STRAIGHT-RUNNING	SNOWPLOUGH
Head, shoulders, knees and toes	Pizza; cake; slice
Robot; Jellyman	Triangle
Touch the ground; reach for the stars	Tepee
Copy Cat	Arrow
Be your favourite animal	Rockets
Flying; Jumbo Jets	Ice cream cone
Kangaroo Hops	Elelphant trap
Giants Footsteps	Tips like each-other; tails don't (Together/Apart)

7. MOVEMENT ANALYSIS

Avoid lengthy one by one runs and too much talking, as the children will become bored.

Younger children, due to the size of their head and muscle strength will have a slightly more braced stance with less bend in the ankle than an adult. Their rotary skills are less developed and they are more likely to use their whole body.

THE SKILLS OF SKIING

The skiing skills are performed differently by children than adults. This is mainly due to the physiological differences in strength, size, weight and body proportions.

The chart below will help you understand these differences and can be used as a quick reference guide when setting realistic goals, teaching the skills and undertaking movement analysis.

	Movement	Reason
STANCE	Break at waist or hip with minimal flex at ankle and knee 3-6 years.	Lack of muscular stength, gains strength from skeletal structure. Support from back of boot/ski tail.
	Wide stance and equally balanced on both feet (up to age 10).	A stable base of support is needed as a lateral balance is not fully developed.
	Braced against outside ski (up to age 10).	Whole leg offers better support and strength (reduce speed and pitch to reduce straining and minimalise overloading joints and muscles .
ROTARY	Whole leg and torso move as one (3-6 years).	Lack of upper and lower body separation.
	Arms make the same movement as legs (3-6 years).	Lack of upper and lower body separation (particularly in the under 6 age group).
EDGING	Wide stance causes constant edging in snowplough (3–6 years).	As stength and balance improves edge changing will be easier.
		Especially for children under 6 years old.
		Shaped skis allow children to edge better and sooner in turns with practise.
PRESSURE	Bracing against outside ski (upper body back and inside) watch speed is not too fast.	Strength gained by using large muscle groups and skeletal structure.
	Pedalling movement to transfer weight - quicker movement (up to age 10).	Less mass and weight than an adult.
		Weight evenly distributed, less weight transfer needed.

8. CORRECTION AND FEEDBACK

Children are easily discouraged. Don't forget to always use the happy sandwich (positive, constructive, positive) principal. Correction of technical errors can be done in the form of games, exercises and images, thereby reducing the need to verbally correct a task or skill.

In fact, throughout your whole career you will be doing this to help expand your repertoire of teaching exercises. To get you started an example of some of the more common corrective exercises with fun analogies is included on the next page.

BALANCE/STANCE – BEGINNER

1. Ski very low, then very tall (tall as a house, small as a mouse).
2. Ski with narrow, then wide stance (spaghetti legs or ski over some cones).
3. Tap inside ski throughout end of the turn (like a Mexican jumping bean or crushing snowballs).
4. Tea pot turns (great variation on the aeroplane turn).

ROTARY - BEGINNER

1. Snowplough turns with small plough (baby elephant/fairy traps).
2. Brush out one foot then other in straight run (spread the peanut butter leg).
3. Use whole body to turn skis (robot turns).
4. Skis off, pivot on spot (make an hourglass shape with your foot, bowtie or a smile).

EDGING - BEGINNER

1. Traverse (speedy highways).
2. Magic button under the arch of foot (squash the bug).
3. Lift little toe side of foot (feeling/ hot spot)
4. Herringbone (duck walk).
5. Listen to edges (what sound do your skis make).
6. Spray snow (chicken out turns - garlands).

PRESSURE CONTROL -BEGINNER

1. Counting throughout turns (can you move as slow as me? let's count it out).
2. Ski with up/down exaggeration (make an adventure through different sized tunnels).
3. Drag outside pole (draw as you ski).
4. Aeroplane turns (you can guess).

9. LESSON SUMMARY

Remember to reinforce your name, where you are meeting the next day and at what time! Make sure all children have returned with you and are with the appropriate person before you leave the meeting place (please refer to your resort policy).

It is important that all children leave the lesson having had a positive, fun and happy experience. If they go away with a smile on their face, you have been successful. It is also worth noting that often two customers need to be served throughout children's lessons. First, 'the child' as they acquire new skills, second, 'the parents' who take great satisfaction in observing the achievements of their children. Often parents who observe positive experiences with their children will decide to take a lesson themselves.

Sometimes it is good to include two summaries at the conclusion of your lesson. One with the group well away from the meeting area to ensure the kids remember what was learnt and where they skied. The second will be with the individual child and their parents, to discuss how their child is progressing.

As it is important to include both the child and parent during the summary, it would be good to talk with the parent about the skills the child has been working on using adult language (stance, rotary, edging, pressure control), but also relate this back to the actual lesson content by telling the parent which analogies and games seem to work best for their child. This will make it easier and safer for the parent to ski with the child afterwards, if they know what prompts and language their instructor has been successfully using during the day.

CHAPTER 4 REVIEW

1. Remember that no two children are alike and there will always be exceptions to the rule. In general, however, describe the coordination differences between a 3 -5 year old and a 14 year old.
2. Every lesson should include the following three important elements. Place these in the order of importance. FUN, SAFETY, LEARNING.
3. List and describe two exercises (or games) for:

- Balance
  1 .....
  2 .....
- Rotary
  1 .....
  2 .....
- Edging
  1 .....
  2 .....
- Pressure Control
  1 .....
  2 .....

4. What are the three key areas related to children's development?
5. Review the child development chart.

- List two characteristics specific to the cognitive development of a 3 -6 year old.
- List two characteristics specific to the affective development of a 7–10 year old.
- List two examples of an 11–14 year old's physical development.
- List two affective traits of a 15–17 year old.

6. Suggest some other ways that you could present the Alpine Responsibility Code to children.
7. List four points that will assist your class handling.
8. Suggest two games to help teach a group of 6 and 7 year olds to stop below the group.
9. What is spider webbing? Give an example using the word 'chocolate'. Use your spider web to create a learning experience for a 12-year-old snow plough turner in a private lesson.
10. Why do 3-6 year old children often break at the waist or hip with minimal flex at the ankle and knee?

THE PROGRESSION

Introduction

ABOUT THIS CHAPTER

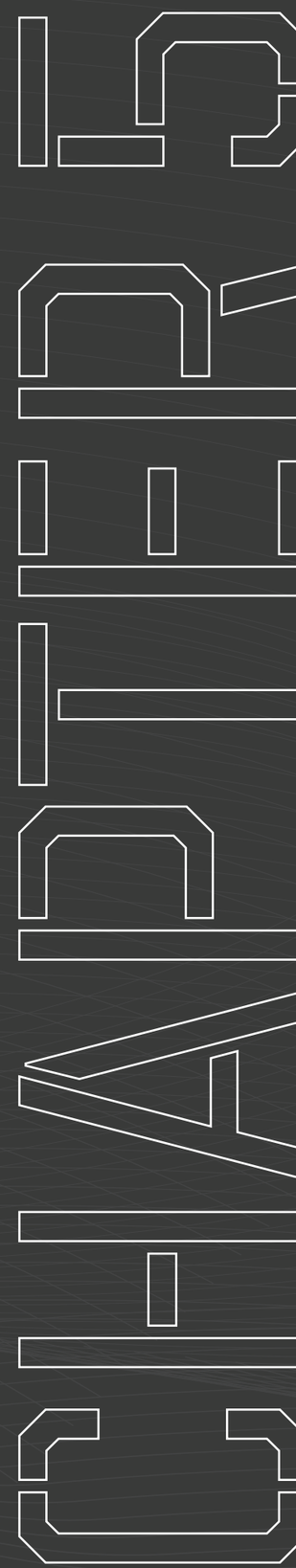
Irrespective of the snowsports discipline you teach, a progression is the backbone to your lesson. This is a step-by-step process for giving information to our guests to help them improve. Without it, the experience would be disjointed and confusing.

On its own the progression is not enough. You will still have to guide your guests to a great experience and it will take a combination of professional attitude (chapter 1) and a solid understanding of technical and teaching concepts (chapters 2 and 3) to be able to present these steps as more than just a list of exercises from easiest to hardest.

The progression chapter is broken into three sections:

- Beginner skiers
- Intermediate skiers
- Advanced skiers

It's important to take a look at all the progressions, as they will be of great benefit to your depth-of -knowledge. The mechanical descriptions in the advanced levels will also help your own personal skiing development.



CHAPTER FIVE: The Progression

CHAPTER 5

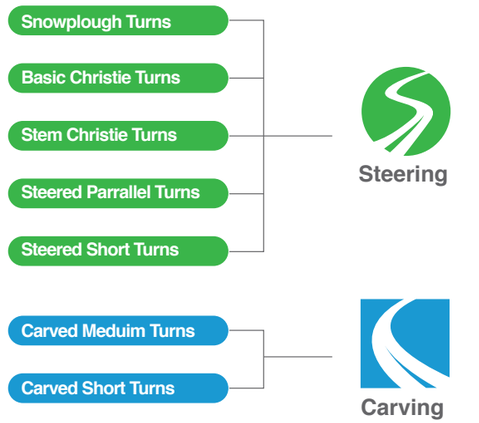
THE ALPINE PROGRESSION

5.1 WHAT IS THE PROGRESSION?

The progression is a collection of tasks used by instructors to teach skiers to move from beginner to the expert level. They are like stepping stones in a river. You do not need to visit every stone to get across to the other side, but if you try to take too large a step, you will probably fall in.

The exercises in the alpine progression are the same. There are hundreds of exercises that you can use to help your guest become a better skier. The ones you choose will depend on the guest's ability and goals. You may spend lots of time on one particular exercise or even create your own mini-progressions to maximise leaning.

5.2 THE ALPINE PROGRESSION OVERVIEW



5.3 FINDING THE INFORMATION YOU NEED

Instructors need lots of 'underpinning knowledge' to teach safe, well-informed lessons. Some of this knowledge includes: the turn mechanics, key points on how to teach the lesson as well as suggested progressions and solutions to fixing common problems.

This segment will give you a quick guide on how each turn or task in this chapter is spaced out on the page, making it easier to find and use the information you need.

HERE IS AN EXAMPLE:

The name of the lesson (and a short description)

Beginner Lesson.

This is a simple way to introduce what you are going to teach your guests, it also includes a symbol used to clearly define what the performance expectation is for that turn.

Previous experience

A description of what the guest should be able to do prior to leaning this step in the progression.

Terrain

A description of the suggested terrain to teach and practice this lesson.

Why

This gives the guest a reason for doing the tasks they are about to learn. It is vital for creating awareness in our students, so they can monitor themselves after the lesson.

MECHANICS

These are the mechanics you need to learn as an instructor to help your understanding, teaching, eye for analysis and demonstrating ability of the turn/task. Where possible, photos will be used to help explain the mechanics and how they relate to each phase of the turn/task.

FUNDAMENTAL MECHANICS TO BE TAUGHT

This is a quick reference of the new mechanics that need to be taught in this particular lesson.

Method/s for teaching

Next you are given the steps that you as the instructor will need to follow to get the guest to experience and hopefully pick up the mechanics involved in confidently making that particular turn. Often the turn may have more than one method of steps to use. Your choice will be determined by factors such as terrain, athleticism of the group, number of people in the group and age.

COMMON PROBLEMS AND SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation

Here you are given a list of common problems you might see in this particular lesson, a description of what they look like, potential causes to the problem, an explanation of how to improve the weakness and some additional exercises or analogies to use.

Once you have successfully found a cause to your guest's skiing inefficiency, you will need to fix it through the use of these explanations and exercises.

KEY POINTS WHEN TEACHING THIS LESSON

These are important points on safety for lesson and include:

- **Safety considerations**
- **Any important notes for planning the lesson**
- **Adaptations to terrain choice and snow conditions**

WRITE YOUR OWN PROGRESSION TO TEACH THIS LESSON

It is very important to spend enough time to further consolidate the movements and skills needed for the correct performance before moving onto the next step.

Using one of the methods for teaching as a framework, you will need to source relevant exercises/analogies and tactics from the common exercises section to plan your lesson. Your lesson should not only teach the fundamental mechanics but also help the guest consolidate the movements and skills needed to recreate the correct performance.

THE FIRST TIME LESSON

LEARNING ABOUT THE SKI EQUIPMENT AND GETTING USED TO BALANCING, THE SLIDING SENSATION AND THE EDGES TO AID MANOEUVRABILITY.

Previous experience

This is the guest's first skiing experience although they may have attempted to move around the beginner area on their own.

Terrain

The ideal terrain for first time skiers is a large flat area with a slight slope at one end and a run out (or counter slope) at the other. If the terrain you use does not have a suitable run out, introduce the snowplough earlier in the lesson.

Why

Balance, sliding, walking and controlling speed are all basic building blocks for a first time skier and addressing these skills now will avoid complications later.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Equipment familiarisation
- Basic stance and balance
- Sliding exercises
- Climb up a small slope
- Glide down in a straight line

Key points when teaching first timers

- Possessing a positive attitude to having fun will help greatly.
- Safety considerations include:
  - Proper clothing, skin and eye protection.
  - How to carry the skis correctly.
  - Fitness levels of the students.
  - Snow conditions - when icy take the students to even gentler terrain.
  - Warm-up and stretching.
- It is imperative that you quickly establish the standard of the beginner group. Is it a slower moving group, an athletic group or a mixed group? There is a different approach and progression for the three types of beginner groups.

Slower moving group

There is no doubt that instructors have to display the qualities of a good teacher during all lessons but never more so than when teaching this type of lesson. Allow the students enough time and repetition to gain a feeling for each new skill and use teacher assistance when appropriate. Even basic skills such as pushing with poles, walking on the flat or side-stepping are a challenge for these students. It will require extra patience and empathy from the instructor to help them learn to ski and enjoy the sport. In certain cases a private lesson can be a good idea. Many factors may constitute a slower moving group and range from fear, to athletic ability or lack of enthusiasm for skiing.

Athletic group

We must avoid subjecting athletic students to a lesson that is slow moving, as this will be, boring for them. The goal is to move them quickly to the snowplough, then snowplough turn and up and down the beginner run so that they are suitably challenged and enjoy the lesson. We also want to show the students that even though they learn rapidly, taking lessons will maximise their potential and enjoyment of the sport. Be careful not to push them beyond their ability. A good sign that a group is an athletic or faster moving group is if they have walked to the lesson wearing their skis or have experience in other dynamic sports such as rollerblading, ice skating, dancing, etc.

A mixed group

A group of mixed abilities is the most demanding of the first time lessons. You have to work hard to look after both standards. The slower students need constant attention to help them keep up, while the faster students need extra, more difficult exercises to keep them challenged and interested.

Method for teaching a beginner progression

- Check equipment
- Warm up and get used to equipment
- Introduce stance/balance
- Sliding, walking and climbing
- Mention falling and getting up
- Bullfighter turn
- Straight runs
- Try to make a snowplough shape

Spend an appropriate amount of time at each step in the progression to suit the athleticism of the group/individual.

Equipment familiarisation

- **Make sure students are dressed suitably.**
- **Explain the need for eye and skin protection (sunglasses/goggles, sunscreen, clothing).**
- **Check to see if the boots are comfortable and done up correctly. If the boots are too painful they may have to be changed. Keep pants and thermals outside of the boot and wear only one pair of socks that are pulled up without wrinkles.**

- **Explain the different parts of the ski that you will mention throughout the lesson (tip, tail, bindings, etc.).**
- **Explain how to get in and out of the bindings and that the back binding has to be open.**
- **Show the students how to remove the snow from the bottom of boots. Banging boots against each other and scraping the bottom of the boot on the binding are two ways.**
- **Show the students how to grip the poles correctly.**
- **To keep athletic groups moving, you can cover equipment familiarisation during the lesson.**

Warm up exercises in boots

These exercises are designed to familiarise the new students with wearing clumsy ski boots and are also good for practising movements that will be encountered in the beginner lesson before the extra worry of sliding.

- **Twisting the legs inwards so your toes point in.**
- **Try the same with feet wider apart.**
- **Hop into this wide stance with toes pointing in as it practices the two movements together.**
- **Try the mechanics of sidestepping and herringbone to climb up the hill (see climbing for mechanics).**

One ski scooter

This is a good exercise to become familiar with the sliding sensation of a ski while still having a free foot (non slippery) to balance and grip with.

- **Put on the outside ski and scooter around in a circle.**
- **Gradually make the circle smaller and encourage the students to keep the ski on the snow to gain a feeling for turning the ski.**
- **Do the same with the other foot.**
- **Use poles to help with pushing and add stability.**
- **Encourage the students to balance on the sliding ski which can be practiced in a one ski straight run. Use this exercise to introduce a good stance and balance.**

Stationary exercises with skis on

These exercises are a good way to get used to the feeling of having skis attached to your feet as well as familiarising students to the slippery sensation under their feet.

- **Shuffling.**
- **Lifting one leg and twisting it in the air.**
- **Rolling the knees from side to side.**
- **Turning around on the spot.**
- **Mixed group: have the faster students jump the tails on the spot and other more difficult exercises.**

Stance

With both skis on, explain the correct stance:

- **With the skis hip width apart and weighted equally, assume a relaxed, natural position on the skis with a similar amount of flex at the ankle, knee and hip joints.**
- **Keep the body weight on the centre or whole foot i.e. not leaning back and not pitched forward.**
- **Hands should be apart and in front of the body. To help your students understand the above description of the position, you must give them a few analogies so that they can formulate a picture in their mind of what it would look and feel like. For example: similar to the golf address, cricket stance when batting, receiving a tennis serve, stance on a netball basketball court, the stance wrestlers adopt when they are about to pounce on each other, etc.**

Pushing with poles

Hold the poles with a normal grip, stick the points in the snow behind the boots with the hands forward and push forward a couple of metres. Place the hands on top of the poles, stick the points in the snow towards the tips of the skis and push backwards. With a mixed group, the faster students can push back and forth for longer distances.

Turning around

In the absence of a flat area at the top of the slope, the students will have to turn around without starting to slide. This requires skilful pole work to prevent them from taking off before they are pointing in the desired direction of travel.

Herringbone

Walking and pushing with poles

The students need to practice coordinating the leg and arm movements while sliding along the flat. Encourage students to apply normal walking movements. With a mixed group, have the faster students race to a certain point and back.

Skating and pushing with poles

Appropriate for athletic groups and children. Anybody that has rollerbladed or ice-skated will pick this up quickly and discover how easily they can propel themselves across the snow. Teach the students to use their poles correctly.

Pushing in a snowplough position

This can be useful for all groups as it allows athletic groups to move quickly into making a snowplough, while slower moving groups will benefit from the confidence it gives them by encouraging the sensation of a gliding ski early in the lesson.

Climbing

'Herringbone'

Try the Herringbone first (for all standards).

Stand facing up the hill with the skis in a reverse snowplough or skating position (ski tips are apart and the back of the skis are together). Tilt the skis onto their inside edges by first widening your stance to greater than hip width and secondly (if needed) by rolling the feet/knees to the inside. Take little steps forward and up the hill keeping the skis in this herringbone position. All students should try this method of climbing first and if they are having trouble or look to be tiring then use the side step method as it will be less strenuous.

'Side stepping'

Stand at a right angle to the fall line, tilt both skis on their uphill edges by rolling the knees towards the hill and keep the skis on their edges while you make steps up the hill. Get used to the slope changes, move the ski tips up or down to stay at right angles to the fall line.

The bullfighter turn

Place hands on top of the poles, stick the points of the poles in the snow well downhill of you with the arms stretched and the poles in line with the arms. Keep the poles a metre apart. Push against the poles holding your body weight up the hill while stepping around to point the skis downhill. Steady yourself, grip the poles normally and let go/push off.

COMMON MOBILITY PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Sliding on the spot	Student cannot stand still and slides off down the hill either backwards or forwards.	Terrain - is it flat? They need to stand perpendicular to the fall line (across the hill).	Draw a line in the snow to help show the best way to stand. Give a clear demonstration and have them mirror your skis.
Cannot push efficiently	Student puts the pole basket near the ski tips or too far in front of their boots.	Place pole tips slightly behind the boots so they are angled backwards to push.	Walking without poles to encourage lower limb effectiveness.
Slipping when climbing: Herringbone	Skis are in V shape but skis slip backwards making it difficult for the student to climb. Legs may look bowed.	Teach how to edge by rolling knees in and standing on the inside of the foot in order to gain edge grip for climbing.	– Cut & spray the snow. – Change to side step if too hard or tiring.
Slipping when climbing: Side Stepping	Skier is side on to the fall line but their downhill ski slips sideways each time they step.	Teach how to edge the ski by rolling knees in, in order to gain edge grip for climbing.	– Roll onto big toe & little toe side of foot. – Cut steps in the snow.
Turning around on the spot	Student steps on or crosses their skis.	Get them to take a series of smaller, deliberate steps that do not cross the skis.	Stationary on flat remind how to make small steps (like stepping out a flower where tips stay in the middle).
Unable to do a bullfighter turn	Student cannot hold themselves up and starts sliding off down the hill.	Hands on the top of the poles. Arms straight. Poles angling back at them. Get them to step out to the platform in a small snowplough shape.	–Look for an easier slope to start from. –Teacher assists the students as they come out to the platform.

Methods of getting up

Method 1: the easiest way is to remove one or both skis by pushing with the poles against the back of the bindings. Roll onto the free leg's knee and stand with use of the poles.

Method 2: (for athletic students and children) bring the skis close and downhill from the body and at a right angle to the fall line (if on a slope). With or without the poles, push off from the snow and use the thigh muscles to pull yourself upright.

Here are some points to consider when helping a guest up:

- **Plan your lift.**
- **Think about the weight of the person in comparison to yourself.**
- **Is it safe to help them to take their own skis off to lessen the strain.**
- **Position yourself in front of the person (don't try and lift from the side or from behind).**
- **Have your feet on either side of the person.**
- **Slowly squat down by bending your hips and knees like a weightlifter does.**
- **Bring the person as close to you as you can (this will help to distribute the weight off the person over your feet and make the move easier).**
- **Slowly straighten your legs (try not to make jerky movements).**

Warning

- **Don't twist as this will put force on your back and can cause injury.**
- **The further the weight is away from you the more strength is required to lift it.**
- **Keep your core muscles tight as this will help keep the back straight.**
- **Bend the hips as well as the knees.**
- **Tell the person what you are about to do and instruct them what you need them to do e.g. 'On the count of three I want you to stand up and lean forward'. This allows for easier lifting as they are helping by not resisting.**
- **It is always better for them to try and get up on their own without you picking them up and risking injury.**
- **Explain to the rest of the group some safe tactics for falling. (1.2.4)**

STRAIGHT RUNNING

THE PURPOSE OF STRAIGHT RUNNING IS TO GIVE THE STUDENTS A FEELING OF SLIDING DOWN THE HILL FOR THE FIRST TIME. FOR STUDENTS WHO PLAY VERY LITTLE SPORT, THE FIRST STRAIGHT RUN CAN BE A DAUNTING EXPERIENCE. TERRAIN WITH A RUN OUT IS IDEAL BUT IF IT IS NOT AVAILABLE THE SNOWPLOUGH HAS TO BE INTRODUCED STRAIGHTAWAY.

How many straight running exercises should you do?

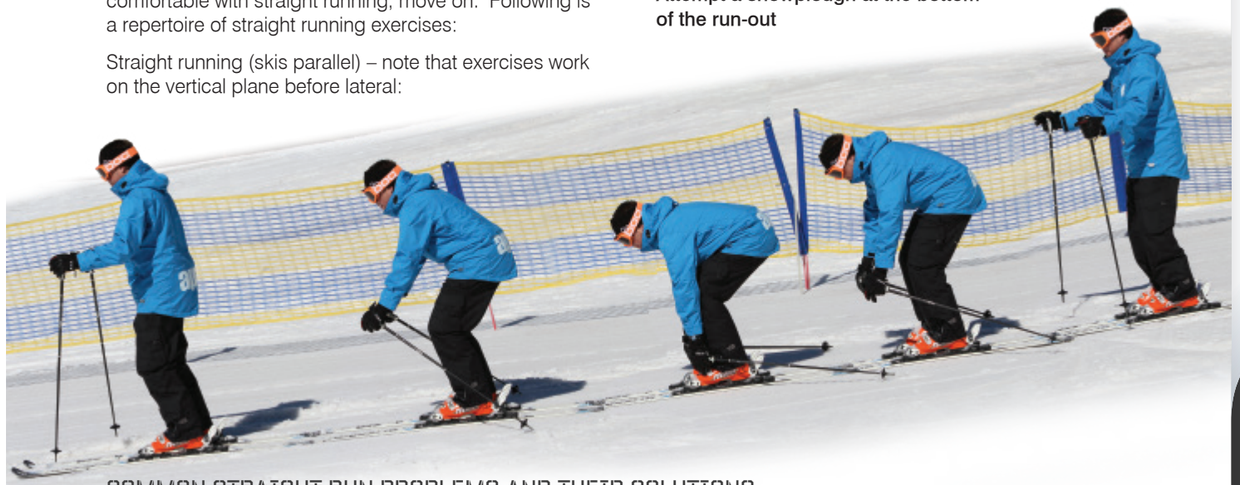
If your group is athletic or of average sporting ability, you may not require any exercises. Instead, move straight into a snowplough.

With a very slow moving or non-athletic group, repeat the first few straight running exercises to allow students to become comfortable with the speed and the sliding sensation.

If your group is mixed, have the slower students try easier exercises and have the faster students go up and down more often doing a variety of more difficult exercises. Remember that as soon as the slower students are comfortable with straight running, move on. Following is a repertoire of straight running exercises:

Straight running (skis parallel) – note that exercises work on the vertical plane before lateral:

- **In the correct stance**
- **Hands on knees**
- **Ankle/knee bouncing**
- **Touch toes/reach high**
- **Lean to each side/touch knee**
- **Shuffling feet**
- **Lift alternate ski tails**
- **Step out of track to one side and back**
- **Step through a gentle turn**
- **Attempt a snowplough at the bottom of the run-out**



COMMON STRAIGHT RUN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Unstable student.	Student wobbles and is unsteady.	Create better core stability, promote athletic stance with good hand position.	–Make sure terrain is not too steep. –Check tightness of boots. –Jumps on the spot.
Sitting back. 	Stance is back of centre, the ankles are often straight with too much bend in the knees causing the weight to fall back. Hands will often be down by their side.	Get the student to move weight forward by decreasing the knee bend, bending the ankle more so they feel their shins lightly touch the front of the boot.	– Ask the student to stand taller, than adjust their stance. – Get the student to lean forward then backward until they feel the middle position. –Tray exercise with one pole . –Teacher assists the skier with poles to help build their confidence.
Crouched/low Position.	Student lowers the centre of mass and may look fearful or unconfident.	Start off on a gentler slope or lower on the hill. Tell the student to stand up taller.	–Exaggerate tall and low stances –Teacher assistance with linked poles.

THE SNOWPLOUGH

A "V" SHAPED POSITION MADE WITH THE SKIS..

Previous experience

Guests need to have spent some time experiencing the sensation of balancing on a moving ski before attempting a snowplough.

Terrain

At first teach on flat terrain and then on the same beginner terrain used for straight running.

Why

- **To control speed and be able to stop on the beginner slope.**
- **This is the position needed to learn to turn at slow speeds.**
- **To help control your speed where there isn't enough room to turn e.g. on narrow trails and when entering lift queues etc.**

MECHANICS OF A SNOWPLOUGH

The mechanics of a snowplough are broken down into two movements that are blended together to appear as one. The first movement is pushing apart the legs and skis and the second movement is a turning inwards of the legs (femurs). These two movements have to be smoothly coordinated to produce a good snowplough. Simply pushing the tails of the skis apart can achieve the two movements simultaneously.

Method for teaching the snowplough

If having trouble with the snowplough shape try stationary first, on the flat (make sure the snow is smooth).

- **With skis on: step into the snowplough and explain the position (stance, tips, tails, position of legs and inside edges).**
- **Jump into the snowplough.**
- **Brush into the snowplough.**

If they can already make the shape, practice in motion:

- **Start parallel, brush into the snowplough at the bottom of a run-out.**
- **Start parallel, brush into the snowplough at the middle of the run and glide to bottom.**
- **Start parallel, brush into the snowplough at the top of the run and glide down.**
- **Repeat until the students are able to make a solid gliding snowplough that controls their speed.**
- **Start off parallel, push with poles and come to a quick stop by pushing into a wide snowplough.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **Push feet/legs apart**
- **Twist feet/legs inwards**
- **Blending the two mechanics together in unison**

COMMON SNOWPLOUGH PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Crossing tips. 	Tips will cross or touch.	Leave a gap between the tips by turning the feet in less when brushing (pushing) out ski tails. Sometimes, just having them push their feet wider apart will push the skis off each other.	– Hold the tips while asking the student to focus on pushing the heels out more.
Tips too far apart. 	Gap between the ski tips is greater than 5cm. Student will have to make their snow-plough extra big in order to slow down.	Check the student is not sitting back; causing the tips to open. Turn your feet/legs in more when brushing the skis apart. Just brush apart the heels/ tails and leave the tips still.	– Lift the ski and twist the thigh and foot to feel the correct muscles needed to turn the toes inward. – Re-explain the snowplough position on the flat and get the student to jump into the position – Teacher assistance
Knock knees.	Knees are clamped or pressed together. Skis become stuck (railed) and do not skid across the snow.	Ask them to keep their knees apart, in line with the leg; the movement has to come from the whole leg not just the lower leg. Standing up taller can help.	– Practice snowplough with skis off. – Practice the snowplough again while stationary. – Make a triangle with the legs & the skis.
Knees apart.	Skier's feet are often close or even touching. The knees move first & open (bowing).	Ask them to move their feet first when they brush out.	– Feel the arches slide out, not the outside of the foot – Lift pinkie toes
Snowplough not large enough.	The skier will go too fast and may end up leaning back, hunching over or causing effects that are associated with being fearful.	You need to get them to push their feet wider apart in the snowplough position so they can be aware of what it does to their speed.	– Practice a while wider snowplough stationary. – Snowplough in and out's.

Key points when teaching a snowplough

- **Note: A wider snowplough position slows you down more and a narrower position allows you to go faster.**
- **If snow conditions are icy, speed control is much more difficult. Stay on gentler terrain.**
- **Before taking the group onto a beginner run with a lift, make them aware of the "The Alpine Responsibility Code" and where to access the information i.e. trail maps, lift stations, toilet doors, etc.**
- **Vary your teaching style. The rigid 'one at a time' approach may have to be used during busy periods when there is less terrain available; but sending the group in pairs or as a group will increase practice time.**

WRITE YOUR OWN PROGRESSION FOR TEACHING SNOWPLOUGH

(Use the above methods and relevant exercises/analogies)

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SNOWPLOUGH TURN

CHANGES OF DIRECTION MADE IN THE SNOWPLOUGH POSITION.

Previous experience

Guests need to be able to make a confident snowplough stop and gliding snowplough in a straight line before attempting to turn.

Terrain

Teach the snowplough on the same terrain as the gliding snowplough or on a very easy/flat beginner run. If not available, linked turns needs to be accomplished before venturing onto the beginner slope.

Why

Turning allows you to:

- Slow down, control speed and stop.
- Safely avoid other people and objects.
- Add to the exhilaration of the sport by giving you the freedom to navigate where you want to go.

MECHANICS OF A SNOWPLOUGH TURN

Initiation

- An up movement is used to help transfer weight to the new turning ski.
- The skis remain in the snowplough position throughout the turn.
- Both skis are turned using a turning force from the legs, although the focus is on the outside ski.

Middle

- Both skis are continually twisted by the legs.
- The ankle and knee progressively roll the outside ski onto its edge.
- The blending of movements creates a good basic position (BP) balanced over the outside ski.

Transition

- From the previous turn the skier is slightly flexed with the weight predominantly on the downhill ski.
- The skier rises to re-centre the stance.

Completion

- A flexing down in all joints is used to help with steering the outside ski.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Holding the skis in a snowplough position throughout a turn.
- Turning of both legs. Even though the focus is on the outside leg.
- Balance on the outside ski.
- Extension/flexion to transfer weight from outside ski to new outside ski.
- Progressive edging to aid with steering.

METHODS FOR TEACHING THE SNOWPLOUGH TURN:

Method 1: J-Turn

- Warm up with a gliding snowplough.
- Stationary, explain and practice how to guide the skis by turning the leg and foot.
- J turn to one side, focus on staying in a small snowplough and turning their legs to guide it.
- J turn the other way, focus on staying in a small snowplough and turning their legs to guide it.
- Link turns together.
- Link two or more turns with balance on the outside ski to help with the direction change.
- Explain and practice how to rise to re-centre and transfer the weight from one turning ski to the other.
- Link turns down a beginner run, focus on edge grip.
- Consolidate snowplough turns by improving steering.

Method 2: Linked direction change

(Good for fast moving students on long gentle terrain e.g. carpet).

- Warm up with a gliding snowplough.
- Explain how to point the front of the snowplough by turning the legs and feet.
- Start in the fall line on very gentle terrain, making direction changes to each side like a snake. Focus on leg turning to achieve this.
- Build the amount of leg turning and turn shape.
- Ask them to first turn their leg(s) then balance over the outside ski after the fall line.
- Explain and practice how to rise to re-centre and transfer the weight from one turning ski to the other.
- Link turns down a beginner run.
- Consolidate steering through stronger leg turning, balancing on the outside ski and by smoothly increasing the edge grip.

5.4
Beginner Progressions
CHAPTER 5 The Progression

KEY POINTS WHEN TEACHING A SNOWPLOUGH TURN

- **As a safety consideration terrain, choice is crucial, always practice good class handling to avoid students turning into the group and if it is icy stay, on very gentle terrain.**

Important note: How turns control speed!

- **The size of the turn - smaller radius turns control speed more often, larger radius turns less.**
- **The amount the turn is finished - turns that are finished less (i.e. not turned out of the fall line as much) are faster. Turns that are finished more (i.e. turned across the fall line) are slower.**
- **Steering - good steering allows you to easily turn across the fall line and vary the turn radius.**

COMMON SNOWPLOUGH TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Sitting back	Weight/balance is to the rear and the student will have trouble holding the snow-plough and the ski tips will often separate.	Teach them to stand taller & brush out the ski tails. May need to do more straight snowploughs. Make sure the terrain isn't too steep.	No poles, hands in air. Jump skis in straight run, stop at bottom of run out. Mould student into the correct stance.
Turning with upper body	Student initiates the turn with the upper body or body and arms. This can sometimes cause the outside ski to skid and inside ski to edge lock.	Teach leg turning first, then stop the body rotation.	Stationary twists with skis off. Bottle cap analogy. Teacher assistance. Student can twist thighs with hands.
Turning ski too flat 	Watching the outside turning ski, the tail slides out and the track widens. This can cause the inside ski to edge lock and possibly rotate the upper body.	Teach the student to roll the foot to and balance on, the inside edge edge of the turning ski.	Point knee to turn. Tip ski boot in like tipping out water. Herringbone-practice climbing to explain edge grip. Magic button/sponge.
Turning ski over edged	Watching the outside turning ski. The ski cuts like a pencil line.	Teach balance over the outside turning ski.	Tip ski boot out Bow ties with a flat ski Have the student hold their own thigh & twist to help break off the edge.
Leaning in 	Student initiates the turn by leaning, like riding a bike. As a result the outside ski can lock on edge.	You need to get them to push their feet wider apart in the snowplough position so they can be aware of what it does to their speed.	Explain outside ski with a drawing in the snow. Touch turning knee. Aeroplane turns. Rolling pin turns
No speed control	Student cannot finish turns, gains speed & loses confidence.	Widen snowplough, follow instructor & develop enough edge to finish turn.	Set cones/obstacle course to develop turn shape. On gentle terrain, snowplough across the hill griping with downhill ski.

WRITE YOUR OWN PROGRESSION FOR TEACHING SNOWPLOUGH TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

LIFT RIDING

(USE THESE NOTES IN CONJUNCTION WITH THE GUIDELINES IN 1.2.5 AND THE POLICIES AT EACH RESORT.)

STUDENT GOALS

- **To learn to ride a lift.**
- **To gain confidence to use a lift outside lesson time.**

SAFETY CONSIDERATIONS

Common to all lifts

- **Be sure the student can handle the terrain serviced by the lift.**
- **Explain loading procedure, ideally at a location where the students can observe it for themselves (be sure not to impede traffic flow or queue).**
- **Be sure students know how to unload and move to a safe spot at the top of the lift, away from the exiting area.**
- **The instructor should organise the class into the required numbers e.g. pairs. Allow sufficient time for safe loading and alternating the class (with public queue) politely into the lift line.**
- **Remove pole straps from wrists, hold poles in one hand with tips facing forward.**
- **Instructors should respect the lift operators' expertise and follow their instructions.**
- **The instructor should take their skis off to assist with loading where necessary.**
- **Advise the lift operator that it is the students' first time.**
- **Ask for the lift to be slowed down if necessary.**
- **The instructor should go last (unless hopping off midway from a surface lift) and ride up with the least confident student. This way you can give advice to anyone who may fall off a surface lift.**
- **In case of a fall on a surface lift, let go of the lift and move away from the lift track.**

Magic carpet/people conveyer

- **Explain how to load and unload.**
- **Push to help them get going if needed.**
- **Can be with or without poles but need to explain how to hold them, pole tips should always be forward.**
- **Keep skis parallel, do not move around on the carpet. Explain that if they fall to move away quickly.**
- **Getting off, ski forward and move away as quickly as possible.**
- **Control your group when loading and in the unloading area.**
- **Assist other instructors, especially with children.**

Rope tow/ cable tow

(Cable tows are the same but have handles to hold onto)

- **Get students used to starting off.**
- **Push to help them get going, use one hand in the small of their back.**
- **First ride without poles then introduce one, then both.**
- **Point out that pole tips should always be forward.**
- **Keep the skis parallel, do not zigzag.**
- **Explain if they fall, to move away quickly.**
- **Getting off; Let go! Move away as quickly as possible.**
- **Control your group when loading and in the unloading area.**
- **Assist other instructors, especially with children.**

Poma lift

- **Same loading and unloading procedure as for rope tows.**
- **Explain that it is not a seat and they should stand with weight evenly on both feet.**
- **Keep pole tips forward.**
- **Beware, pomas may lift children off the snow.**
- **Disembark only at designated off-loading area.**

T-Bar

- Explain loading and unloading procedures unique to t-bars.
- Pair-up class with talented and confident paired with the less confident. Send strong pairs first.
- Simulate T-bar action by using instructor's poles or using training T-bar, usually at beginners' area.
- Explain that students should not sit down, but stand up, and let the bar pull them up the hill.
- Nominate who will take the "T" and ask students not to throw the "T" away.
- Explain to keep pole tips forward.
- If children prefer to ride as singles, encourage them to pair up and match them according to height.
- A common mistake when unloading is to get off too soon. Explain to students that they should wait until they are on the flat, and not at the crest where they will first see the 'unload here' sign.

Chairlift

- Explain where to load and unload and the procedures unique to chairlifts. Children require special care with chairlifts and should be told to sit still while riding (for safety).
- Remind the group of the dangers of loose clothing.
- Instructors with small children who need the lift slowed should move them all in one group so that the chair will be slowed only once (if practical).
- Instructors should find competent adult partners, as small children should not ride alone. The child should queue to sit on the lift operator's side for assistance.
- Ensure that the safety bar is lowered during the ride (especially important for children).

Using practice chairs with a run-out are a perfect way to introduce the offl-load before riding

BASIC CHRISTIE

A SNOWPLOUGH TURN WITH A MATCHING OF THE INSIDE SKI, TO PARALLEL POSITION AT THE END OF THE TURN.

Previous experience

The guest needs to be able to steer a snowplough turn in control on beginner terrain and be comfortable/willing to go faster.

Terrain

Teach on the same beginner run you have used to consolidate the snowplough turn.

Why

- To ski faster and more comfortably on steeper terrain. Staying in the snowplough on steeper terrain is strenuous and uncomfortable.
- It's easier to control your speed with your skis in a parallel position.
- It's the first step to becoming a parallel skier.

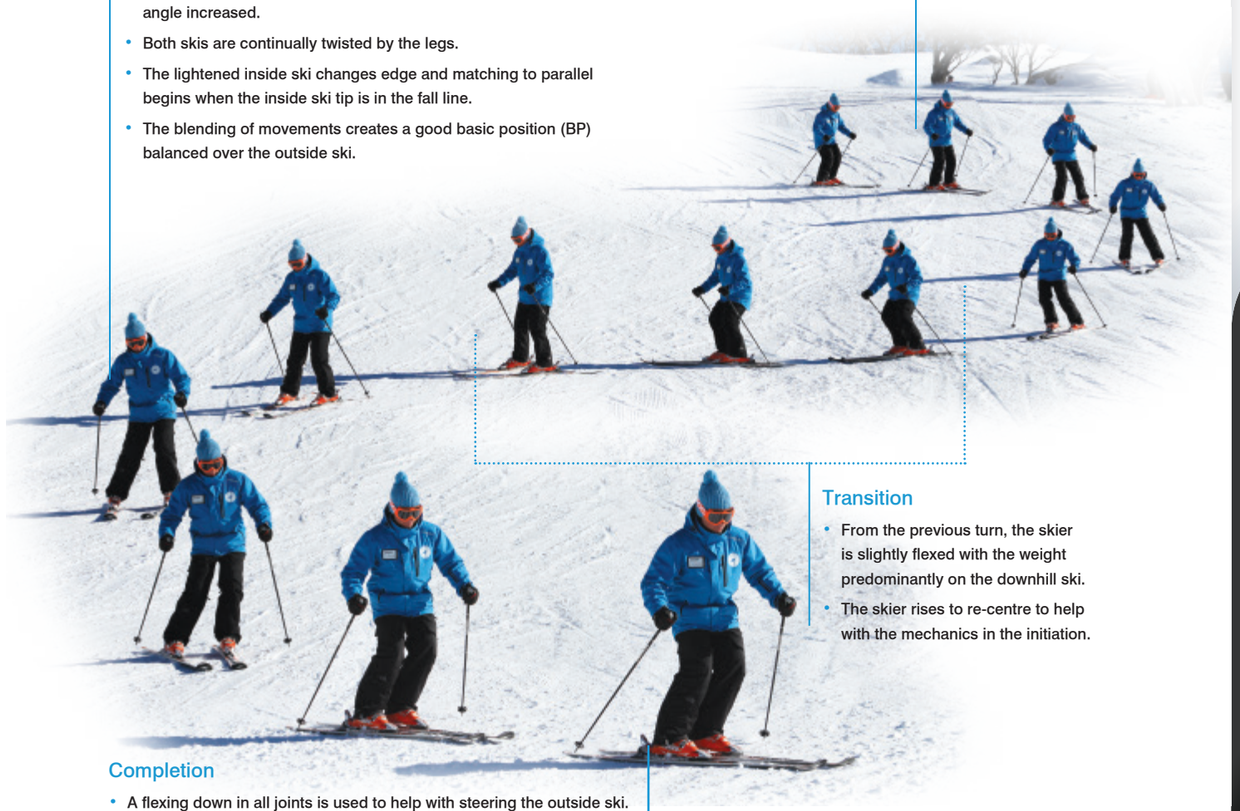
MECHANICS OF A BASIC CHRISTIE

Initiation

- An extension movement is used to help flatten the skis and guide them into a snowplough.
- The snowplough is slightly smaller and the speed traveled is increased from a snowplough turn.
- Both skis are turned using a twisting force from the legs although the focus is on the outside ski.

Middle

- Gradually the weight is shifted onto the outside ski and edge angle increased.
- Both skis are continually twisted by the legs.
- The lightened inside ski changes edge and matching to parallel begins when the inside ski tip is in the fall line.
- The blending of movements creates a good basic position (BP) balanced over the outside ski.



Transition

- From the previous turn, the skier is slightly flexed with the weight predominantly on the downhill ski.
- The skier rises to re-centre to help with the mechanics in the initiation.

Completion

- A flexing down in all joints is used to help with steering the outside ski.
- The inside ski is steered to a complete match to parallel.
- The turn is completed with a parallel christie phase.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Slightly smaller snowplough.
- Encouraging a slightly faster speed.
- Inside ski changes edge from inside to outside edge in/after the fall line.
- Inside ski is steered in to a match and the turn is finished with parallel skis.

METHODS FOR TEACHING THE BASIC CHRISTIE

Method 1 (slower moving students)

- Warm up making snowplough turns using a smaller plough and encouraging a slightly faster speed (gentle terrain is important).
- Stationary, face across the hill in a small snowplough and explain how to change the edge and match the uphill ski. Balancing on the downhill ski is essential to achieving this.
- In a shallow uphill Christie, steer the snowplough up the hill, change edges of the inside ski and match.
- Repeat the above two exercises to the other side.
- Link basic Christies practicing the edge change and match.
- Consolidate basic Christie turns by improving steering.

Method 2 (athletic students)

- Warm up making snowplough turns with more speed using a slightly smaller snowplough (terrain is important).
- Linked snowplough turns attempting to match the inside ski at the completion of the turn (use exercises like thumper turns, lift and match etc.).
- Try making the tail match by sliding it in.
- Stationary explanation of edge change and matching of inside ski with snow contact.
- Link basic Christies with edge change and match.
- Challenge the students to match the inside ski as early as possible in the turn.
- Consolidate basic christie turns by improving steering.

KEY POINTS WHEN TEACHING A BASIC CHRISTIE

- Steps needed before you teach matching the skis in a basic Christie:
  - You need more speed than the snowplough turn.
  - You need a smaller snowplough.
  - You need good balance on, and strong steering with, the outside ski.
- The edge change and match can sometimes happen spontaneously if the above mechanics are focused on. Other good edge change analogies and exercises include:
  - Flattening the ski and using it like a knife to spread butter as you slide it in.
  - Rolling to the little side of the foot.
  - Garlands to practice multiple matches.
  - Traversing and side slipping to get the feel for corresponding edges.
- Stay on easier terrain if icy. Matching on the ground can be difficult in slushy conditions, doing it in the air tends to be easier.

COMMON BASIC CHRISTIE PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Snowplough too big, not enough speed.	The snowplough is too big therefore the student is moving too slowly. Student has difficulty rolling the inside ski onto the uphill edge (little toe side), the tail of inside ski catches in the snow.	Take the student to flatter terrain, encourage to ski a bit faster in a smaller snowplough.	- Tapping the tail of inside ski - Garlands - Use shallow single turns - J turns to understand speed control through turn shape
Turning with body not legs (body rotation). 	Student initiates turn with upper body/whole body, hips or a body part other than the legs. When the body twists, the inside ski stays behind and locked on inside edge, thus very difficult to match the skis. Student will often try to pull off the edge & increase the amount of rotation.	Teach leg turning first, then stop upper body rotation . This will make it easier to match skis at the end of the turn.	- Stationary twists with skis off - Bottle cap analogy - Student can twist thighs with hands - Boot arcs - Garlands - Pole exercise (tray) to stop body rotation
Leaning in. 	Student leans first to initiate the turn, like riding a bike. This makes it difficult to roll the ski onto the uphill edge.	Teach balance over the arch of the outside turning foot/ski and then work on matching skis.	- Explain outside ski with drawing in snow - Touch turning knee with both hands - Tapping the tail of inside ski - Garlands - Aeroplane turns - Rolling pin turns
Skis run straight after matching	Student is moving across the hill after matching the skis, doing a traverse instead of round turns. No speed control, especially on steeper terrain.	Emphasise continued steering during and after the match (with both skis).	- Uphill Christies - J turns - Following the instructor's track - Drawing in snow to show turn shape - Use knolls to aid turning

WRITE YOUR OWN PROGRESSION FOR TEACHING BASIC CHRISTIE TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

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STEM CHRISTIE (EARLIER MATCHING)

A BASIC CHRISTIE WITH MORE SPEED AND AN EARLIER MATCHING OF THE INSIDE SKI, IN OR BEFORE THE FALL LINE.

Previous experience

Before increasing speed and trying to match the skis earlier, the student needs to able to comfortably steer basic Christies in control down green runs through to easier blue runs.

Terrain

Initially teach the stem christies on the same green runs and then onto easy blue runs. The guest needs to feel confident with the increased speed so easy terrain is extremely important.

Why

- It's a stepping stone towards parallel skiing.
- Skiing more parallel is less taxing on your body especially when starting to ski steeper terrain.
- It's also a useful tool for negotiating difficult snow conditions and/or in poor visibility.

MECHANICS OF A STEM CHRISTIE

Initiation

- An up movement is used to help flatten the skis, facilitate the weight transfer and to guide them into a small snowplough.
- An increase in speed helps with an earlier weight transfer to the outside ski.
- Both skis are turned using a twisting force from the legs although the focus is on the outside.

Middle

- Due to the earlier weight shift, the new lightened inside ski changes edge and steers to a parallel match in or before the fall line.
- Both skis are continually twisted by the legs and progressively tipped onto the edges by blending ankle, knee and hip angulation.
- The blending of movements creates a good basic position (BP) balanced over the outside ski.

Transition

- From the previous turn, the skier is slightly flexed with the weight predominantly on the downhill ski.
- The skier rises to re-centre and help with the mechanics in the initiation.

Completion

- A flexing down in all joints is used to help with steering the outside ski.
- The turn is completed parallel.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Slightly smaller snowplough.
- Encouraging a slightly faster speed.
- Earlier weight transfer to the outside ski.
- Inside ski changes edge from inside to outside edge earlier in the turn i.e. before the fall line.
- Inside ski is steered to a match and most of the turn is performed parallel.

Method for teaching a stem christie

- Warm up skiing with a smaller snowplough and more speed.
- Explain how to make an earlier weight transfer to the outside ski.
- Linked turns challenging the students to match as early as possible. Use exercises for changing edges and earlier weight shift.
- Consolidate stem christie turns with stronger and earlier steering of the outside ski.

COMMON STEM CHRISTIES PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Snowplough too big – not enough speed	Snowplough is too big. The terrain might be too steep. There is not enough speed to match before the fall line.	Take student on an easier/ flatter slope and re-explain the need for going faster and making a smaller snow-plough.	– Tapping the tail of inside ski earlier in the turn – Challenge to lift the inside ski-stork turn – Following the instructor for speed
Late weight shift	Balance stays on both skis too long, poor or incorrect weight shift. The skis will match late.	Teach an earlier weight shift by rising/extending onto the outside ski at the top of the turn.	– Bike pedaling – Garlands – Step up the hill to encourage extension on the uphill ski – Encourage early/strong steering of outside ski (to increase focus on pressing the arch) – Draw a turn in the snow and show where to match
Turning with body not legs (body rotation) 	Student initiates turn with upper body/whole body, hips or a body part other than the legs. The turn is usually rushed and the outside ski skids. Balance can end up the on inside due to the rotation.	Teaching leg turning first then stopping upper body rotation will make it easier to match the skis at the end of the turn.	– Stationary twists with skis off – Bottle cap analogy – Student can twist thighs with hands – Boot arcs – Garlands – Pole exercise (tray) to stop body rotation
Leaning in (banking) 	Falling in after matching. Basic position is lost through the middle and end of the turn.	Teach gradual balance over the outside ski throughout the whole turn.	–– Stork turns/tapping the tail of inside ski all the way to the end of the turn – Rolling Pin turns – Pole Drags – Tray Exercises
Z-shaped turns	Turns not round, very choppy and rushed.	Work on progressive steering, follow the instructor's track for turn shape.	– Patience turns – Use little bumps to turn around them – Draw round letters i.e. C or S – Trace instructor track

KEY POINTS WHEN TEACHING A STEM CHRISTIE

- **Where the skis are matched in the turn will depend on the student. The idea of this turn is a small stepping stone on the way to parallel. Therefore, as long as the skis are matched earlier than a basic Christie, they are on their way towards a parallel turn.**
- **The earlier weight transfer is achieved by standing up on the new outside turning ski, not by bending down or out over the outside ski.**

WRITE YOUR OWN PROGRESSION FOR TEACHING STEM CHRISTIE TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

SITUATIONAL PROGRESSIONS

INTRODUCTION TO SCHOOL RACES

ANY ORGANISED SLOPE WHERE MARKERS HAVE BEEN PLACED SHOWING A PARTICULAR PATH THAT A SKIER NEEDS TO FOLLOW.

Previous experience

As long as the guest can turn comfortably on the terrain where the course is set, they can experience the fun of a set race course.

Terrain

Terrain should always be easier than where the group normally skis (green terrain).

Why

Fun and as a tool to practice turn shape and turn mechanics.

MECHANICS WHEN INTRODUCING RACING

- **Mechanically they will ski whatever turn they are making. This could be anything from snowplough turns and up.**
- An introduction to basic racing tactics.
- Important to teach them which way to go around the gates (or cones).
- Where and when to start.
- Introduce a tuck through the finish (can be fun).

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety and race course etiquette
- Where to start and finish
- Which side to turn

Method for introducing racing

- Safety is the first priority.
- Check the terrain is appropriate for the student's skiing ability. If not, explore the possibility of having a course set on easier terrain.
- Inspect the course with the group explaining where to start, where to finish and wait, which way to ski around the gates and general race course etiquette.
- Send students through the course one at a time. Start by having them ski slowly and once you are confident they are skiing around the correct side of the gates, encourage them to go faster.
- Teaching a tuck through the finish can increase the thrill (optional).

KEY POINTS WHEN INTRODUCING RACING

- Safety should be the number ONE priority, always make sure the course is in a clear open area with gentle terrain.
- An introduction to racing may be in the form of an organised ski school race at the end of a week or simply cones set on the rope tow to practice turns. Either way, the experience should be fun.
- It can be a timed event but does not have to be.

COMMON BASIC RACING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Fear	Skier is too scared to ski the race course.	Introduce the course as a fun experience with no winners. Check that the set and the hill is appropriate for their ability.	– Set a course on very gentle terrain – Set only a few turns – Set fun obstacles, like jumps or tunnels to make it more fun – Inspect the course first by following the instructor
Student skis the wrong side of the gates	Skier skis on the wrong side of the first turn and continues down the course.	Make sure all understand which side to turn.	– Use dye to mark the course – Stand near the first turn to remind – Follow instructor through course

WRITE YOUR OWN PROGRESSION FOR TEACHING INTRODUCTION TO RACING

(Use the above method and relevant exercises/analogies and tactics)

INTRODUCTION TO BASIC JUMPS

GETTING A SMALL AMOUNT OF BALANCED AIR TIME OFF A NATURAL KNOLL, IN A CONTROLLED ENVIRONMENT.

Previous experience

The guests need to be able to make controlled and balanced steered snowplough turns before attempting to jump.

Why

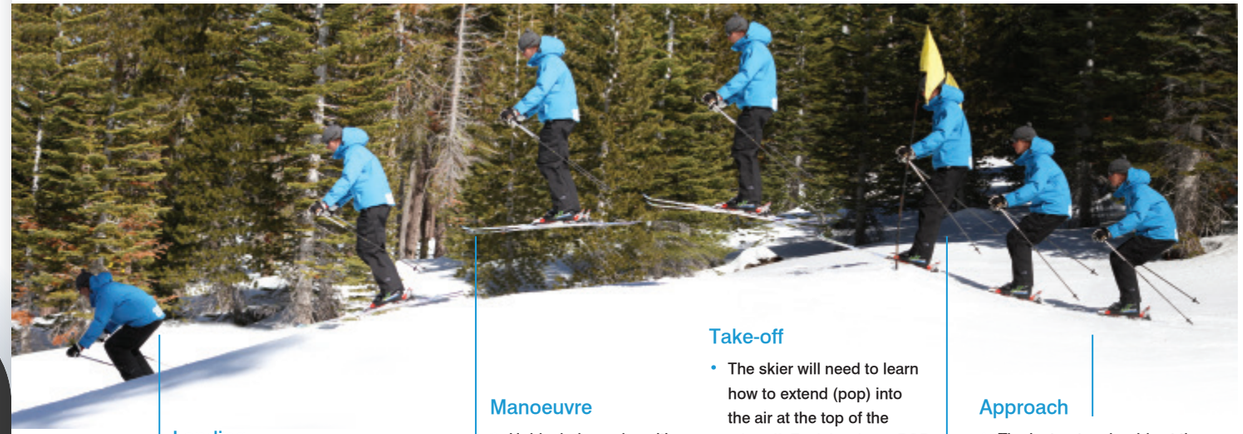
Jumping can be a lot of fun and many children's groups love the sensation of 3cm of air. Skiing over roll-overs can also improve balance.

Terrain feature

Choose convex (round) natural roll-overs that are clear of any obstructions.

MECHANICS WHEN INTRODUCING JUMPS

As the jumps used in this introduction are all natural features, make sure they are clear of any obstructions and good etiquette is followed (including you as the spotter).



Landing

- Land perpendicular to the landing zone with hands forward.
- Legs flex to absorb the landing.

Manoeuvre

- Hold a balanced position in the air with the hands in front of the body and feet hip width apart.
- Air time should always be kept to a minimum.

Take-off

- The skier will need to learn how to extend (pop) into the air at the top of the take-off. Explain what a POP is, extending in the legs while moving CoM forward to allow for a landing in a centred position.

Approach

- The instructor should set the starting point so the student approaches at the correct speed.
- No speed checking should be necessary if a safe speed is used.

KEY POINTS WHEN INTRODUCING JUMPS

- Act as a spotter and make sure you can clearly see the take-off and landing.
- Set the run in height so no one jumps too high/far. It's always best to get the air from popping rather than skiing faster into the jump.
- A slightly downhill sloping run-out is needed. Avoid flat landings.
- Introduce terrain park etiquette.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety and jumping etiquette
- Approach/in run speed (A)
- Popping on take-off (T)
- Balanced air time (M)
- Balanced landings (L)

Method for introducing jumping

- Warm up by rolling over other small bumps/jumps that are natural features on the run.
- Point out any safety concerns to the students with the jump/area you have chosen. Emphasise terrain park etiquette and the importance of a clear jump with use of a spotter.
- Stationary, show guests how to pop and land a few centimetres forward of their take-off position in a good centred stance with their hands forward. Draw a quick picture to show them where they will pop on the jump.
- Set the distance to ski into the take-off so the speed/air time is kept to a minimum. Use a marker or reference point so all the students are aware of where to start their in-run.
- Demonstrate and let you students have a go. After your demo, be sure to hike back up and be the spotter for the group.
- Consolidate by practicing on some more natural features/rollovers you can find. Air time should be done with hands forward for balance (feet hip width). Explain and demonstrate a landing that is perpendicular to the hill. A diagram in the snow or freestyle max can be a handy teaching tool.

COMMON PROBLEMS WITH BASIC JUMPS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Jumping too high/far	Skier loses balance in the air, possibly flapping their arms.	Approach Check the steepness of the jump & shorten the approach (often, at this level it is up to the instructor to set speeds for the take-off). With the reduced speed and take-off ramp, the student will now need a 'pop' to get air.	– Cut & round off the jump – Ski (roll) over the jump at a slow speed – Put poles or markers for the start of the run-in – Pop to get air off any rolls/bumps (rather than relying on the speed and feature)
Stance too far back on take off	Body backwards & not perpendicular to take off ramp.	Take-off Maintain shin pressure on take off and keep the shoulders over the toes	– Practice stationary pops. – Keep legs strong in take-off, not floppy. – Arms forward on take off. – Ankle bounces for shin pressure when on the groomed runs
Landing in back seat	The landing looks like sitting on a seat or the student may even fall backwards.	Landing Spot landing in the air. Use pictures to explain how the CoM moves forward to align for landing.	– Use a 4 point landing. – Land on the middle of your foot. – Spot or look at your landing. – Land with hands/arms in front of the body.

WRITE YOUR OWN PROGRESSION FOR TEACHING INTRODUCTION TO BASIC JUMPS

(Use the above method and relevant exercises/analogies and tactics)

5.4A COMMON BEGINNER EXERCISES

STANCE - BEGINNER

- Ski with head tilted to chest and then looking up.
- Ski with eyes open/closed.
- Close uphill or downhill eye in turn or traverse.
- Ski with narrow, then wide stance.
- Ski without poles – hands high, behind back, on knees, arms folded.
- Ankle/knee bouncing throughout turn.
- Rock fore and aft.
- Ski very low, then very tall.

Straight run hops

Helps with balance and an athletic stance.

- Stationary - hopping on a flat surface. Teach students how to flex all 3 joints and rapidly extend them to jump in the air.
- Practice hopping, focus on landing on the whole foot.
- Pay attention to the athletic position that the student lands in and relate this to the skiing stance.
- Try one hop in a straight run.
- Try several hops in a straight run.

Straight run lifting one leg

Works on lateral balance and an athletic stance.

- Try lifting one leg for a split second when doing straight runs.

Using a run out for straight running exercises

Helps to keep students safe and in control. Also builds confidence in beginner students.

- Start low on the hill and work your way up.
- Make sure the run-out is sufficient by trying it yourself.

Core stability and ready position

Helps to stay balanced. Also builds confidence in beginner students.

- Check to see the boots are done up correctly.
- Get the student into a tackle ready position.
- Tell the student to get ready for a push or pull by tensing their core.
- Give them a small pull and push to ensure they are in an athletic ready position.
- Try this ready position whilst skiing.

ROTARY - BEGINNER

- Brush out one foot then the other in straight run.
- Use whole body to turn skis/use lower body only to turn skis.
- Skis off, pivot on spot.
- Box turns.
- Specified number of turns in a specified distance.
- Use bumps or knolls to start turns.
- Twist legs on chairlift.
- Lie on back and have a friend hold your boot while you try to turn the leg.

Bow ties

Leg turning and pivot point.

- Stationary-twist the leg while trying to leave a bow tie pattern in the snow.
- The twisting sensation should come from the thigh while the pivot point remains under the centre of the boot.

Lift ski and twist

Leg turning.

- Stationary-lift one ski and twist it a few times over the other ski.
- The twisting sensation should come from the thigh while the hips and upper body stay still (use poles to help).
- You can increase the feeling of which muscles to use in leg turning by twisting the ski tip into a partners hand or your pole.

Pole handle pivot

Leg turning and pivot point.

- Stationary-twist the leg while standing on top of a pole handle.
- The twisting sensation should come from the thigh while pivot point remains under the centre of the boot.

Manually turn leg

Leg turning.

- No poles hold outside leg with hands and try to twist (wring out) femur bone.
- Outside hand bellow butt cheek (glute), inside hand slightly above knee cap, turn both.

Bottle cap anaolgy

Leg turning and pivot point. Balance on the outside ski.

- Bottle cap analogy (press and twist). Use picture to explain where on the foot to balance.

Boot arcs

Helps promote leg turning when introducing turns. Also useful for skill blending.

- With skis off, practice making an arc or the letter 'C' in the snow.
- Try again with focus on holding pelvis still. Hips stay still and the movement comes from the thigh.
- Have a go at making a turn/turns with the C shape feeling.

Tray exercise

For consolidation of leg rotation and balance on the outside ski.

- Show how to hold the poles in the tray position and take a run with the stable upper body that should face GENERALLY down the hill.
- Try some stationary leg turning exercises.
- Take a few runs to work through twisting the legs and not the hips.
- Focus on rise and re-centre with the poles up and in the centre to start the new turn.
- Introduce the concept of tipping the tray out of the turn after the fall line by easing into the outside leg and balancing over the outside ski (snowplough turns and basic Christie).
- Take a run with the poles in the normal position and imagine the tray is still there to get used to skiing normally.

Other exercises/adaptations to try:

- TV screen turns (hold poles vertically making an imaginary box to look, generally down the hill, through to keep upper body still and focus on turning the legs).

Inside ski turns

Nice step to focus on to encourage inside leg turning for basic christie and stem christie students.

- Explain how to press down on the little toe to flatten the ski at the start of the new turn. Explain this in relation to rise and re-centre with weight on both feet for basic christie and snowplough.
- Stationary-lift the ski and twist to point inside ski. Keep hips still while twisting inside leg. Feel for the turning muscles of the new inside ski.
- Feel inside ski light at the end of the snowplough turn and while matching throughout end of turn for basic Christies.

EDGING - BEGINNER

- Traverse.
- Lift little toe side of foot (feeling).
- Listen to edges.
- Spray snow (can use garlands). Side step spray.
- Skating
- Herringbone.

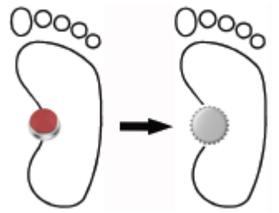
Squash the orange

Works on progressive edging to help with turn shape and speed control.

- In a stationary snowplough, try gradually squashing the juice out of an orange under the arch of the outside foot.
- Demonstrate a snowplough turn without squashing the orange and then another one, progressively squashing the orange through the turn. Point out the difference in turn shape and speed control.
- Students try squashing the orange in their turns (try a single turn on each side before linked turns for un-athletic students).

Magic button (sponge)

Edging the outside ski. Steering and blending skills on the outside ski.



- Use picture to explain where on foot to press the magic button to trigger the turn (this spot will give more grip to the outside ski).
- Encourage progressive movement (sponge instead of button). Focus to encourage progressively pressing water out of the sponge to grip progressively around the turn.
- Use the bottle cap analogy under the arch of the foot to help steer the outside ski.

PRESSURE CONTROL - BEGINNER

- Counting throughout turns
- Ski with up/down exaggeration
- Take the pressure off the inside ski like pedalling a bike
- Balance on one ski at a time
- Tea pot turns (variation on the aeroplane turns)
- Feel inside ski light throughout turn
- Ski over different snow conditions

Pole taps

Keeps balance on the outside ski.

- Have the student make a snowplough turn tapping the outside pole in the snow a few times during the turn.

Drag outside poles

Keeps balance on the outside ski.

- Drag outside pole to help balance over the outside ski.

Aeroplane turns

Keeps balance on the outside ski. Helps with shifting weight and re-centreing.

- No poles - arms out wide like the wings of a plane.
- Dip outside arm over outside ski during the turn by easing into the outside leg and tipping out of the turn (just like the opposite of a plane while turning).
- Re-centre with level arms in the transition and repeat to the other side.

Thumper turns

Can be used for balance on the outside ski at the end of a snowplough turn and basic Christie.

- Stationary – tap the tail of one ski. Explain how this shifts the balance to the other foot as well as keeping the balance forward.
- Traverse – tap the uphill tail several times to practice the balance.
- Repeat the other way.
- Try to tap the tail of the inside ski after the fall line at the end of the turn to ensure balance on the outside ski.

Rolling pin turns

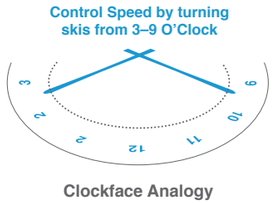
Can be used for balance on the outside ski at the end of a snowplough turn and basic Christie. Also helps with development of separation and a basic position.

- Take a run or 2 focusing on rise and re-centre with the poles held together in hands like a rolling pin, up and in front to encourage weight on both feet and twisting both skis to the fall line.
- After the fall line, roll the rolling pin down the outside of the thigh to move progressively into a basic position. Encourage flexing while still twisting into this position to gain extra grip and balance on the outside ski.
- Create a mantra or count the timing of the movement before putting poles back to normal position and put the movement back into the student's skiing.

OTHER EXERCISES

Clock Face

- Turn from 10 to 2 or 9 to 3 (imagine a clock face is on the ground and 12 o'clock is always directly downhill, turn the tip of the skis to the numbers for speed control).



Clockface Analogy

Single Turns

- Shallow turn: is a good tool to practice the finish of a turn without gaining too much speed.
- J-Turn: by starting in the fall line, J-turns are faster and can be used to work on the end of a turn and to prove turn shape can control speed.
- Full turn: practicing a single turn is a great way to introduce a new movement pattern. A full turn also allows you to assess their basic position at the middle of the turn.
- ?-Turn: is good way to introduce a turn transition allowing the guest to isolate the movements when linking turns.

Kids – 'Red light/ green light'

Provides a fun way for practicing snowploughs and balance.

- Instructor to call out colours of lights. Students do as follows:
- "Red Light" = Stop (big snowplough)
- "Green Light" = Go (straight run)
- "Orange Light' = Slow down (small snowplough)
- "Purple Light" = Jump (small pop from legs)

'Smallest snowplough challenge'

Gets students to reduce the size of their snowplough and learn to control their speed through turn shape, which then makes matching their skis in christie turns easier.

- Use easy terrain to start with.
- Stationary try making a very small snowplough and explain we will use this size plough in our snowplough turns.
- Demonstrate one or two turns in a small plough. Finish off the turns to show speed control.
- Students have a go.
- Make a 'challenge' to how small of a plough students can maintain while linking controlled turns.
- Promote trying to make the plough as small as possible after the fall-line by bringing the inside ski closer to the outside ski (helps lead into basic Christies).

Obstacle course

Encourages students to make turns. Gives them an external objective to promote turning mechanics.

- Build an obstacle course. Using things like ski poles to turn around, lines in the snow to jump over, limbo to duck under, snowballs to squash and circles to stop inside of.
- This will help challenge each of the skills you have worked on in the lesson in a fun way.

Other ways to improve turn shape include:

- Ski in a line, rotate leaders.
- Set a track and have your students follow.
- Patience Turns: Counting throughout turns to round out the turn, to the fall line and after fall line.
- Follow my track: Task the students to make round turns themselves (discuss speed in and before fall line and slowing down as you turn across or back up the hill.

5.5 INTERMEDIATE PROGRESSIONS

POLE PLANTING

THE ACTION OF PLANTING THE INSIDE POLE AT THE START OF THE TURN

Previous experience

Pole planting can be taught at any stage from a stem Christie onwards.

Terrain

Pole plants can be taught on any run that the guest feels confident on, as the movements at first can disrupt the coordination of the legs. Do not make it too steep.

Why

- It helps to stabilise and block the upper body from turning (stops the upper body from rotating in short turns).
- It gives the skier confidence to commit to the new turning ski, the pole gives you support for a split second (larger base of support).
- At higher speeds it gives the skier more confidence to commit to a strong crossover.
- Upward lift; helps with un-weighting.
- Proprioception; it aids in determining the position of the body in relation to the slope.
- Turning force; when planted effectively it can exert a useful rotary force on the skier.

MECHANICS OF A POLE PLANT

- The hands always remain forward and slightly to the side.
- Pole planting occurs in the direction of the new turn (left pole when turning left).
- The pole is swung using the wrist and forearm.
- The plant usually occurs during the edge change at the initiation. It aids the timing, rhythm and commitment to the crossover movement into the next turn.
- Generally the pole plant aims towards the tips of the ski and out to the side.
- Once the pole touches the snow the skier hinges at the wrist skiing past the tip while keeping the hands out in front of the body.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Correct arm position
- How to swing
- Correct timing and side

Method for teaching pole planting

- Warm up by skiing a run with arms in correct position.
- Stationary, practice how to swing the poles with the wrist and forearm. Practice planting the tip forward and out to the side.
- For non-athletic, guests traverse with pole plants on the downhill side.
- Try single turns with a pole plant.
- Repeat to the other side.
- Have students follow you to copy your movement.
- Work on pole plant timing.

KEY POINTS WHEN TEACHING A POLE PLANT

- For athletic students, it can be more appropriate to teach after the steered parallel turn.
- Learning the pole plant may disrupt the coordination of the leg movements. For older, less athletic students, it can be helpful to teach the pole plant after the stem Christie as planting the pole at the completion of the weight transfer aids balance.
- Holding the poles and straps correctly will lessen the chance of injuring the thumb. Also check that the pole has a basket.
- The guests may have to revisit the learning process of the pole plant at any time over their skiing lives as timing and dependence on the planting of the pole changes depending on the situation.

COMMON POLE PLANTING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Planting wrong pole 	The uphill pole is planted. Unstable upper body, no help at initiation.	Explain which pole (downhill or the side they are turning) and why the pole plant is needed. Follow & copy the instructor with small traverses giving more time to practice.	– Single turns – Garlands with pole plant – Double pole plant – Car indicator analogy – Follow the instructor
Incorrect timing	Upset balance, unstable upper body, body gets thrown back due to a late pole plant.	Draw a picture on the snow & have the student time the arm swing with the extension.	– Follow and copy the instructor – Verbal cues “Pole then turn!” – Hockey stops with pole plant – $ turns
Arm dropping back 	Arm dropping back, upper body moves around too much or rotates; student repeatedly has to reach forward to make another pole plant.	Stationary exercises - swinging poles with wrist and forearm only.	– Holding a third pole across both hands and pointing the finger to hold – Garlands to practice 1 arm
Upper body rotation after pole plant	Student leans on the pole too much and for too long after the pole plant. It looks like the student uses a pushing motion rather than a touch or as if they hold onto the pole plant and turn around it.	Focus on keeping both hands forward after pole plant to stabilise the upper body. Teach a light tap rather than a push.	– Holding a third pole between the middle and the pointing finger – Lighter touch not heavy plant “don’t hurt the snow” – Punch hand after touch to keep hand moving forward

WRITE YOUR OWN PROGRESSION FOR TEACHING POLE PLANTING

(Use the above method and relevant exercises/analogies and tactics)

STEERED PARALLEL (MEDIUM)

THE SKIS REMAIN PARALLEL AND ARE STEERED FROM THE START TO THE FINISH OF THE TURN.

Previous experience

The guest must be able to match before the fall line and be confident to go fast enough to attempt a parallel turn.

Terrain

Initially teach on longer green runs, then on blue runs. Convex terrain or the tops of small bumps can assist with the parallel initiation.

Why

- It's easier on the muscles during a day of skiing compared to stemming.
- Parallel skiing is faster and more exhilarating.
- Parallel skiing is a prerequisite for advanced skiing (carving, skiing at high speed, dynamic short turns, dynamic mogul skiing, freeride and racing etc.).
- Parallel skiing looks more refined.

Initiation

- The extension is also used to establish an early weight shift to the new outside ski before the steering angle is created.
- The skier then turns both skis simultaneously towards the fall line via a twisting force from the legs.

Transition

- From the previous turn the skier is slightly flexed with the weight predominantly on the downhill ski.
- The increased speed helps with an earlier weight transfer to the outside ski.
- The pole swing should continue progressively through the transition.
- The skier rises to re-centre and release the edges of both skis simultaneously.

Middle

- Balance is maintained on the outside ski, while both skis are continually steered together. Progressive edging and twisting from the legs is needed to achieve this.
- The blending of movements creates a good basic position (BP).

Completion

- A flexing down in all joints is used to help with steering the outside ski to completion.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Encouraging a slightly faster speed.
- Early weight shift to the new outside ski.
- Simultaneous edge release and change.
- Simultaneous turning of both legs/skis.
- Use of an extension/flexion movement to achieve these mechanics.

Method for teaching a steered parallel turn

Rise, roll and turn method

- Warm up encouraging a slightly faster speed. Look for knolls to turn on.
- On gentle terrain explain and practice the simultaneous movement of both skis at the parallel initiation.
- Make single turns either starting at 45° to the fall line OR full turn upside down question mark.
- Rise (extend) onto the turning ski to achieve early weight shift.
- Roll both feet downhill (to flatten both skis).
- Turn both skis at the same time, the appropriate speed is crucial.
- Link turns and work on simultaneous edge release by tipping both skis together and turning both skis together.
- Use knolls and tops of bumps to help the parallel initiation.
- Consolidate with stronger steering on the outside ski.

KEY POINTS WHEN TEACHING STEERED PARALLEL

- Speed is key. It's extremely difficult to make a parallel initiation if the student is going too slowly.
- To progress from the stem Christie to the steered parallel turn is a challenging step. It is not unlike taking away the training wheels from a bicycle.
- If the students' skis do not grip on icy conditions stay on gentler terrain. Be wary of very slushy conditions; the skis tend to track and need even more speed or up movement to help them turn.
- This is a good opportunity to introduce the pole plant. It gives the students more confidence to commit to the new turning ski.
- The two factors that greatly help learning to ski parallel are SPEED and TERRAIN.

Stork turns are a great excersice to practise an early weight shift to the outside ski.

WRITE YOUR OWN PROGRESSION FOR TEACHING STEERED PARALLEL TURNS

(Use the above method and relevant exercises/analogies and tactics)

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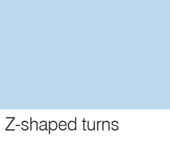
STEERED SHORT TURNS

QUICKER PARALLEL TURNS THAT ARE STEERED IN A SHORTER RADIUS.

COMMON STEERED PARALLEL PROBLEMS AND SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Too slow	Student is going too slowly to maintain a parallel initiation, causing the skier to stem at the start of the turn. Often the skier will lean back and inside to get the turn started.	Take the student to flatter terrain, practice going a little bit faster by skiing an elongated turn in the fall-line and by not finishing the turn as much.	– Try to keep up with your instructor. – Ski in pairs to promote speed by chasing. – Draw the turn shape in the snow. – Patience turns.
Upper body rotation 	Upper body turns first and the tail of the outside ski may skid downhill at the end of the turn causing a down stem.	Work on progressive leg turning and a stable upper body.	– Stationary leg turning exercises. – J turns. – Hockey stops (work into a fan progression). – Exercises with poles. – Clock analogy turn.
Not releasing both skis	Student is not releasing the skis simultaneously and stemming at the start of the turn.	Practice simultaneous edge release, stationary first, and then in a traverse. Make sure you use appropriate terrain to gain enough speed.	– Garlands. – Side slipping edge release. – Stationary 'rise, roll, turn'. – Focus on the release of the downhill ski (exaggerate little toe feeling). – Narrow, small edge rolls on very flat terrain. – Use knolls to help. – Patient turn (roll & let the ski fall).
Late weight transfer	Stemming at the start of the turn. Skier does not rise at the turn initiation.	Focus on transferring the weight during the turn transition.	– Traverse with lifting the tail of the downhill ski. – Practice single '? -turns' with enough speed. – Stork turns. – Stationary step-ups. – Pedal turns. – Verbal cues 'stand on it then turn'.
Banking (leaning in)	The skier will tip the whole body into the turn. No angulation or BP is formed. Balance on the outside ski can be lost.	Teach balancing over the outside ski through the whole turn.	– Stork turns. – Thumper turns -tapping the tail of inside ski all the way to the end of the turn. – Swords. – Tray Exercises.
Skidded turns	The skier will slide sideways for a distance causing a loss of turn shape. The upper body might rotate as the skier drifts below their intended target.	Progressive edging through the turn to help with steering the outside ski.	– Pushing the arch into the snow (magic button or sponge). – Stationary knee angulation using the pole for resistance. – Lift up the little toe side of the foot.
Z-shaped turns	Turns not round, very choppy, rushed or pushed out.	Work on progressive steering, follow the instructor's track, earlier and progressive edging.	– Patience turns. – Draw round letters ie. C or S. – Consistent leg twisting to produce a round turn.

Previous experience

Guests need to be able to do a medium round, steered parallel turn that is made in control on easy blue runs before attempting short turns.

Terrain

Terrain choice may vary, choose the right method for the beginner/intermediate terrain you have available.

Why

- Short turns are a fun and exciting alternative to longer radius turns.
- Good to improve safety and control on narrow or crowded runs.
- You need short turns to ski advanced bumps, steeps, powder and narrow trails.

MECHANICS OF STEERED SHORT TURNS

Initiation

- The skis change edges and are twisted from the legs, realigning them to the direction of the upper body.

Transition

- From a flexed position the skier makes a pole swing.
- The skier rises to re-centre and releases the edges of both skis simultaneously.

Middle

- The upper body is held by the core muscles to remain stationary and facing down the fall line.
- From this strong position the legs are continually turned in a fast cadence under the stationary upper body and pelvis.
- The blending of these movements creates a good basic position (BP).

Completion

- A flexing down in all joints is used to help with steering the outside ski to completion.
- The turn is finished in a countered/ anticipated position, ready to start the next turn.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Upper/lower body separation.
- Fast/strong leg turning against a strong/ stable upper body and core.
- Rhythmic pole plant.

METHODS FOR TEACHING STEERED SHORT TURNS

Method 1: Snowplough wedeln

Good for gentler terrain and for guests who need to work on leg turning.

- Warm up using a funnel or similar to work into shorter turns.
- Snowplough wedelns with strong leg turning.
- Snowplough wedelns with a stable upper body for legs to work efficiently.
- Snowplough wedelns with an active weight shift. Use analogies such as pedalling a bike or the medicine bottle cap.
- Snowplough wedelns into parallel turns holding upper lower body separation throughout.
- Parallel short turns working on separation and rhythmical pole plant.
- Improve skill blending to promote a rounded turn shape by working on the weakest skill.

Method 2: Hockey stop

Good for moderate terrain and working on speed control.

- Warm up with a funnel or similar to try short turns.
- Hockey stops with strong leg turning and separation.
- Hockey stop to both sides.
- Linked hockey stops with pole plant to help separation and timing.
- Linked hockey slows (smoother, rounder hockey stops).
- Smoother, rounded short turns. Work on steering mechanics to consolidate.

KEY POINTS WHEN TEACHING STEERED SHORT TURNS

- Fitness level of students and fatigue can be an issue, monitor this throughout your lesson.
- A very good way to warm up or introduce basic short turns is to use the funnel analogy to slowly shorten the radius of the turns.
- Leg turning and separation should be explained to the students as a faster way to turn the skis resulting in the short turn cadence. It's achieved through isolating strong, fast muscle groups and by creating the coiling effect with the body.
- Reciprocal teaching (skiing in pairs) is a fun way to develop the feeling for the rhythm and coordination in short turns.
- The students will require lots of practice on appropriate terrain to attain coordination and the feeling for short radius turns.

COMMON BASIC SHORT TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
No upper/lower body separation 	Turn initiation with upper body/whole body. Slower rhythm than a short turn. Potential loss of edge and down stemming.	Explain that the turning effort has to come from the legs under a stable upper body. Develop upper/lower body separation.	– Stationary leg turning exercises. – Snowplough wedeln. – Pole targeting exercises. – Clock face analogy with body facing 12 o'clock.
Banking 	The whole body inclines/tips into the turn.	Explain quite/stable upper body (it should not twist?? or tip).	– Swords. – Tray exercises. – Focus on an object in the middle of the run. – Ski in pairs and give feedback. – Watch your shadow while skiing. – $ sign turns with body on the line.
Weak edging (Skidded turns)	Skis skid sideways and the cadence (tempo) of the turn slows down. Leg turning and separation is hard to generate.	Steering the outside ski with better edge grip. Rolling the ankle and knee to tip the ski onto the edge. Check the equipment and tune.	– Balancing on the arch of the outside foot. – Snowplough wedelns with balance on the arch. – Cowboy turns.
Not a short enough rhythm	Turns are too big/long.	Explain how to turn quickly with the legs, with no pause between the turns. Use an up and down motion to help with turning.	– Verbal cues i.e. 1, 2, 1, 2. – Follow the instructor, ski in pairs, syncro. – Funnel. – Fast hockey stops.
No speed control	Student cannot finish their turns, gains speed and loses confidence.	Explain turning the legs/skis more across the hill to finish the turns.	– Hockey stops. – Clock face analogy. – Pivot slips (Braquage). – Mileage on easier terrain.
Crossing the ski tips 	When turning the outside ski, turns under the inside ski.	Turn both skis/legs together. Start with longer, slower, more patient parallel turns.	– Funnel. – Hockey stops. – Pivot slips (Braquage). – Cowboy turns.

WRITE YOUR OWN PROGRESSION FOR TEACHING STEERED SHORT TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

MEDIUM CARVED TURNS

SIMILAR TO A STEERED PARALLEL TURN EXCEPT WITH MORE SPEED, EDGE ANGLE AND THEREFORE A STRONGER EDGE GRIP.

Previous experience

Guests will need to feel confident in making faster parallel turns and be able to control their speed on blue/black terrain.

Terrain ■ ◆

Best to use blue and easy black runs. Firmer snow conditions are good to help the students edge strongly when practicing.

Why

- To improve stability at higher speeds.
- To ski steeper terrain with greater control.
- Carving starts to utilise the design of the ski by tapping into its side cut, making the turns more efficient at greater speeds.
- Carving is something that most skiers aspire to achieve as it looks more dynamic.
- It is a very useful turn to introduce guests to maintaining speed in a race course.

MECHANICS OF MEDIUM CARVED PARALLEL TURNS

Initiation

- The skiers' Centre of Mass can move further to the inside than a steered turn due to the increased speed and edge grip they are balancing against.
- Although the inclination has been increased, the body produces angles to help with the higher edge angle and balance over the outside ski.

Transition

- From a flexed position, the skier makes a pole swing.
- The skier extends and crosses over the skis at the same time producing a high and early edge grip.

Middle

- Progressively increasing the edge by creating more ankle, knee and hip angulation.
- A stronger twisting force from the legs continually guides the skis on this higher edge angle.
- A change in the independent leg length is required. A longer outside leg resists force while shortening the inside leg allows the hips to move into the turn and keep the weight balanced on the outside ski.
- The blending of these movements creates a good basic position (BP).

Completion

- Flexing of all joints is used to help with the continual guiding of the outside ski as well as dealing with the increased pressure built up from a more dynamic turn.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Encourage more speed.
- Increase angulation and inclination to produce stronger edging throughout the turn.
- Stronger leg turning to guide the ski on this higher edge angle.
- Progressive development of angulation to continually increase the edge angle and continue carving the skis at a higher speed.
- Earlier and stronger edging by extending and crossing over the skis.

Method for teaching a medium carved parallel turn

- Warm up - ski medium turns slightly faster trying to dig in the edges.
- Stationary - explanation and demonstration of angulation to produce stronger edge grip.
- Ballistic Christie (fast J-turn) with enough speed and angulation to allow strong carving (railing is not the goal here).
- Repeat to the other side
- Link turns with strong angulation to help with edge grip and balance on outside ski.
- Work on making the angulation and edging progressive.
- Use leg turning exercise to develop strong leg turning to power the skis around on the edges and to maintain a natural amount of upper/lower body separation.
- Explain the need for a crossover movement for early edge grip and emphasise with stationary exercises.

KEY POINTS WHEN TEACHING MEDIUM CARVED TURNS

- The mechanics introduced in this teach will help the guest with control at higher speed.
- To complement angulation, a feeling of stronger edging and grip on the snow can sometimes be gained by pressing the arch of the outside foot down into the snow.
- For aggressive students, you can start purely with inclination of the body to create greater edging, working on angulation secondary to help with refining.
- Both very icy and soft snow conditions can make it harder to teach this turn and can be unsafe.

COMMON CARVED MEDIUM TURN PROBLEMS AND SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Weak edging	Skis skid and there is a wider track left in the snow.	Stronger edging. Progressive edging, stationary first and then in motion.	– Tug– of– war – Fast J turns – Medium radius power– plow on green terrain, working on knee and hip angulation – Check equipment (especially if icy) – 500 steps
Banking 	The whole body leans into the turn. Not enough angulation. The skis don't grip as efficiently and the turn shape may not be round.	Work on hip and knee angulation. Practice single turns focusing on hip/knee angulation, then blend together.	– Tug of war – Swords – Traverse side/slip garland, focus on basic position when edge is engaged – J turns with strong angulation
Whole body rotation	A square position that doesn't create a lot of hip angulation, you will see mainly knee angulation and banking.	Strong leg turning to twist the skis on a high edge angle. Stable hips/upper body allowing the skier to ski into a basic position.	– Stationary leg turning exercises e.g. boot arcs – Javelin turns – Hands on the hips
Poor cross– over 	Skier will pop up in the transition. This flattens the skis and doesn't facilitate early edge grip. It can also put the skier into the backseat. The turn won't be as dynamic or tight.	Crossing over the skis to an early edge. Staying lower in the transition. Moving forward in the transition.	– Partner cross-over – Stationary leaning on poles cross over – Skating down the fall line (easy terrain) – Swords for lower transition – Hop turns lifting the tails to move forward – Low edge rolls.

WRITE YOUR OWN PROGRESSION FOR TEACHING MEDIUM CARVED TURNS

SITUATIONAL PROGRESSIONS

INTRODUCTION TO MOGULS

MAKING STEM CHRISTIE OR STEERED PARALLEL TURNS ON A FEW EASILY SPACED MOGULS.

Previous experience

Guests who benefit best from this lesson are people who control their speed by steering stem Christies or parallel turns and have a desire to ski in some moguls.

Why

- To open up more terrain and add variety to the skiing experience.
- Gives the students the skills to negotiate difficult terrain that they may accidentally find themselves on.

Terrain

The appropriate terrain is steeper green runs with small, round, well-spaced bumps. Wide runs with areas to escape the moguls can be less intimidating for their first time.

MECHANICS INVOLVED IN INTRODUCTION TO MOGULS

Middle

- The legs continue to be twisted somewhat faster underneath a strong upper body.
- Due to the faster leg turning, the middle of the turn has a similar size to that of a short turn.
- Progressive edge grip is developed on the outside ski enabling a round turn to be steered on the downhill side of the mogul.

Initiation

- The pole is planted on top of the bump to aid in balance and upper body stability.
- The flattened skis are twisted easily with the legs due to the pivot point being positioned under the feet. This is established by initiating the turn on top of the bump where the skis tips and tails are in the air.

Transition

- It is important for the skier to visually choose a bump to turn on that has a forgiving exit and doesn't lead directly into a wall of another bump.
- From a flexed basic position, the skier makes a pole swing as they start to go up the bump.
- The skier extends to de-angulate the old basic position, flatten the skis and help transfer the weight to the new outside ski.

Completion

- The counter created by twisting the legs and a flexing down in all joints develops a basic position (BP) that is balanced over the downhill ski.
- Once the skier has steered the turn to a finish and slowed to their desired speed, they will continue traversing in this BP across several moguls and troughs.
- An adjustment in their stance, forwards and backwards, is needed to stay in balance with the change in terrain.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Developing fore/aft balance by traversing though bumpy terrain.
- Pivoting the skis on top of the bumps with a pole plant and up motion.

Method for introduction to moguls

(First time in moguls)

- Warm up - ski medium radius turns to the bumps. Use a stance balance exercise to help.
- Traverse through some bumps to get used to the fore/aft balancing in the bumps.
- Stationary - explain how to turn/pivot the skis on top of the bump.
- Single turn over the bump with a pole plant and up motion.
- Link turns with even smaller traverses (like a funnel).
- Consolidate by exploring easy mogul fields and working on steering mechanics.

KEY POINTS WHEN TEACHING AN INTRODUCTION TO MOGULS

- Turning on top of the bumps allows an easier/faster pivoting of the skis. This will help control speed in this sometimes intimidating terrain without having to rush and throw you out of balance.
- This technique may be needed to negotiate small moguls that form at the end of a day.
- Avoid going into the bumps if the conditions are too icy.
- Also avoid bigger or too tightly spaced bumps.
- Fore/aft balance is easily disrupted when first traversing through the bumps. It will require repetitive practice and time spent in this terrain to become comfortable with it.
- At this stage absorbing the bumps is NOT taught. Absorption technique is introduced when the students are comfortable skiing faster through the moguls.
- Can use the small bumps to help teach and consolidate the basic parallel turn.

COMMON INTRODUCTION TO MOGULS PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Turning too early or too late on the bump 	The back of the skis can get caught on the bumps and it looks like walking or tripping over the bumps.	Initiating the turn on the top of the bumps. Having the pivot point under the feet when turning.	– Stationary practice on top of the bump – Single turns on top of the bump – Try to use pole plant to help with timing – Use rolls and other natural features – Follow and copy instructor
Speed control 	Student does not finish their turns. They gain speed & lose confidence.	Explain turning the legs/skis on the side or shoulder of the bump and not in the valley. Edge strongly on the side of the bump.	– Linked hockey stops – Follow the instructor
Pole plant	None or not correct pole plant.	Remind students when and where to pole plant i.e. top of the bump.	– Draw faces; pole plant being the nose – Single turns – Follow instructor

WRITE YOUR OWN PROGRESSION FOR TEACHING INTRODUCTION TO MOGULS

INTERMEDIATE RACING

INCLUDES ORGANISED RACE EVENTS SUCH AS INTERSCHOOLS AND IS ALL ABOUT SKIING THE COURSE SAFELY AND ENJOYING THE EXPERIENCE.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- How to start.
- How to finish.
- Understanding a correct line.
- Ski performance will depend on their individual ability level at the time of the race.

MECHANICS OF INTERMEDIATE RACING

When training students to enter an organised race event such as Interschools, the main mechanical goal is for them to understand what they have to do to ski the course safely and experience the exhilaration of crossing the finish line.

Method for teaching intermediate racing

- Safety should be the first priority.
- Check students skiing and ensure that the course that is set is not too steep for them to succeed. If so, explore the possibility of having a course set on easier terrain.
- Check with course official/race department that the course is open and it is OK to do an inspection or to take the students down the side of the course and explain how they are required to go around the gates.
- Once at the bottom of the course, explain how the finish area works.
- Send students through the course one at a time. Start by having them skiing slowly and once you are confident they are taking the correct path, then encourage them to go faster.
- Explain how the start wand works and the correct technique for 'breaking the wand'.
- It is now time to introduce 'line'. Encourage students to complete most of their turn before they get to the gate. This will enable them to recover if they make a mistake. Draw pictures in the snow with your pole to help explain the correct line or use analogies.
- Consolidate their session with one simple technical focus that will help them ski better and stay on the line you have trained.

Previous experience

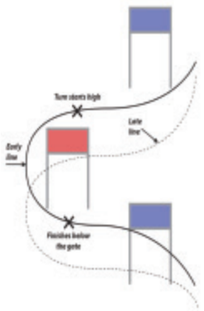
Guests who benefit best from this lesson are those who can make a parallel turn and are working towards carving.

Terrain

The best terrain is green to blue.

Why

- Racing at Interschools will often be their first organised race event and some guests participate to make up team numbers.
- Racing is a fun experience and can improve a skier's understanding of carving and its usefulness at speed.



KEY POINTS WHEN TEACHING INTERMEDIATE RACING

- Better to challenge the students with exercises before introducing more difficult terrain.
- Racing will entice skiing at higher speeds. To do this safely in a race course it will take an understanding of 'line'.
- Students may have already tried a ski school race. However, this will most likely be their first organised event. Therefore, the ski performance of the students will depend on their existing standard and skiing experience.
- Students should know what to do in the event of a fall (i.e. getting out of the way).
- You need to help keep the course in good condition by working as a slipper and instilling good race etiquette by encouraging your students to help with slipping and pulling the course.
- Advise the students to wear a helmet.
- Teaching the student about race rules will be needed at competition level.
- Always include a course inspection.

COMMON INTERMEDIATE RACING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Intimidated by race gates.	Moves away from gates or ski an extremely wide line.	Use stubbies or cones until comfortable.	– Angle GS gates towards centre of the turn (away from skier). – Brush course challenging skiers to get their skis closer to the brushes each time.
Misses a delay or flush.	Constantly skis out of course at that point.	Emphasise the importance of course inspection. Follow the instructor at slower speed. Start to read the course further ahead by keeping your eyes up.	– Use dye to mark correct course. – Use brushes to mark path. – Inspect the course again with skiers.
Misses the finish.	Student turns before the finish line or even goes on the outside of the timing.	Re-explain how to finish and have student follow you slowly through the finish. Keep vision up if skiers are in a tuck through the finish.	– Use dye to mark directly across the finish line. – Practice tucks straight between imaginary finish lines. – Tuck turns on the groomed with good vision forward.
Trouble staying on an early line.	Skidding below gate or even out of the course as they are unable to make the next turn.	Re-explain a correct line and focus on dynamic skiing with strong edge grip both in and outside the course.	– Use dye. – Use brushes to mark the turn initiation. – Edging skills for direction and tighter turns. – Follow the instructor. – Practice 2-3 turns at a time in the course.

WRITE YOUR OWN PROGRESSION FOR TEACHING INTERMEDIATE RACING

(Use the above method and relevant exercises/analogies and tactics)

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5.5
Intermediate Progressions
CHAPTER 5 The Progression

INTERMEDIATE JUMPING

AND AN INTRODUCTION TO BASIC AIR UNDERSTANDING HOW TO CONTROL SPEED AND HEIGHT WHEN TAKING OFF FROM BEGINNER JUMPS, SO YOU CAN STAY BALANCED ENOUGH IN THE AIR TO ATTEMPT A BASIC TRICK.

Previous experience

The guest needs to be able to make controlled and balanced steered stem christie turns before attempting tricks in a beginner park.

Terrain feature

Choose convex (round knolls) natural roll-overs that are clear of any obstructions or use any available beginner terrain parks.

Why

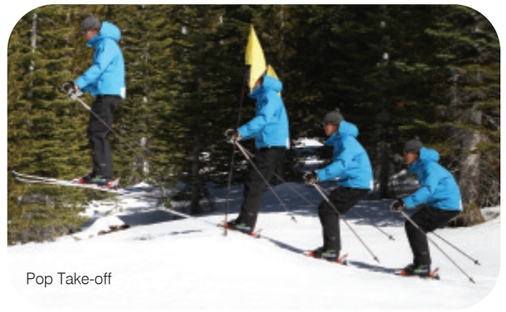
Jumping is fun and as you gain confidence in the air tricks can improve the look of your jump.

MECHANICS OF INTERMEDIATE JUMPING

As with basic jumping, the skier will need to learn how to extend (pop) into the air at the top of the take off, hold a balanced 'T' position and land perpendicular to the landing zone with hands forward. However, other techniques will be needed to control air time as jumps used may range in size. Additional techniques include stiff legs/core and a retraction to help with control in the air; allowing the skier to perform basic tricks without disrupting balance.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety
- ATML
- T = 3 take-off styles to control airtime: Pop, Absorption and Static
- M = basic tricks



Pop Take-off

Manoeuvre: Trick

Absorption

Static legs and core

Method for teaching intermediate jumping

- Explain the three take-off styles: **pop**, **absorption** and **static**.
- Stationary pops - show guests how to extend (pop) and land a few centimetres forward of their take-off position in a good centred stance.
- Practice popping on an easy jump with centred landings.
- As confidence improves take the group to a beginner style terrain park; emphasise terrain park etiquette.
- Tuck jumps, legs suck up in the air and extend for the landing.
- Stationary - explain how to do a trick in the air
- Choices of air include:
- Safety grab (two fingers under the boot), remember to lift legs, don't reach down.
- Spread eagle (star jump).
- Twister or back scratcher (old school jumps where skis are moved into a position during air time).
- Lui Kang (like safety grab except leg not being grabbed is extended).
- Mute grab (toe crosses in front of other foot).
- Tail grab (tweak it by holding the ski close to the tail and pushing it out).

KEY POINTS WHEN TEACHING INTERMEDIATE JUMPING

- Act as a spotter and make sure you can clearly see the take-off and landing.
- Set the run in height so no one jumps too high.
- A slightly downhill loping run-out is needed. Avoid flat landings.
- Reinforce terrain park etiquette.

COMMON INTERMEDIATE JUMPING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Popping too high in the air. 	A loss of balance in air can result in the need to wind down imaginary car windows to regain balance. Skier might overshoot the landing.	<u>Approach</u> Set the correct run in for the height of the jump and the student's ability.	– Start off slower & smaller. – Re-explain the best choice take off for this jump (solid, pop or absorption). – Use a marker/ indicator for where the students should start their in-run. – Tow in's (follow the instructor).
Stance too far back on take-off.	Body backwards & not perpendicular to take-off ramp. The skier may look out of balance once in the air and land on their tails.	<u>Take-off</u> Shin pressure on take-off and body perpendicular to the jump.	– Practice stationary pops. – Keep legs strong in take-off not floppy. – Arms forward on take-off.
Loss of stability while doing a trick.	Upper body goes off axis in the air, either to the side, rear or forwards.	<u>Manoeuvre</u> Move arms & legs towards trunk.	– Correct speed into take-off. – Use freestyle max to explain.
Landing in back seat.	Landing looks like sitting on a seat or the student may even falls backwards.	<u>Landing</u> Spot landing in the air. Movement of arms/shoulders forward when in the air.	– Use a 4 point landing. – Land on the middle of your foot. – Use visual aids like die on the landing.

WRITE YOUR OWN PROGRESSION FOR TEACHING INTERMEDIATE JUMPING

(Use the above method and relevant exercises/analogies and tactics)

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INTRODUCTION TO A BOX SLIDE

SKIING STRAIGHT OVER A MAN-MADE BOX.

Previous experience

Guests who benefit best from this lesson are people who control their speed by steering stem Christies or parallel turns and have a desire to slide a box.

Terrain feature

Use only 30cm (or more) wide plastic topped boxes. If a box is not available in a resort's beginner park, do not attempt a rail.

Why

- Straight running over a box is a good way to introduce the speed and feelings associated with sliding on a box, in a much safer and more controlled environment.
- It is also a fun new way of skiing for more advanced skier when lack of snow means less terrain options.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Terrain park etiquette
- ATML

Method for teaching box slides

- Intro to terrain park etiquette and smart style.
- Show students the box and features such as take-off, sliding surface and landing area.
- Stationary - show them the correct stance for straight running on the box.
- Allow to ski a straight run over the box.
- Session the box a few times and practice a straight line in, pop on, pop off, centred stance, absorbing the landing etc.

KEY POINTS WHEN TEACHING A BOX SLIDE

- **This progression is to introduce the guest to the sensation of sliding on plastic (box) instead of snow.**
- **Skiers need to be able to comfortably travel in a hip width parallel position.**
- **An introduction to jumps and ability to hockey stop will be of benefit the students.**

COMMON BOX SLIDING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Not enough speed	Skier stops on the middle of the box, due to slow speed & may even be doing a snow-plough.	Approach Set a good run in height to ski faster & ski in a parallel position down the box.	– Ski parallel along narrow ridges. – Instructor can ski beside, setting the speed. – Use a smaller, less intimidating feature.
Not straight on the in-run	Skier starts on a crooked angle into the box (i.e. not straight). They may be unbalanced on the feature and exit before the end of the box	Approach Explain where to start and how to ski a straight line from the approach across the feature and through the landing.	– Draw a line in the snow with your pole marking the approach. – Draw a picture in the snow of a straight line through the feature. – Mark the starting point of the approach and make sure it is on the correct line.
Doing the splits	Skis go either side of the box & into the splits	Manoeuvre Use a wider, smaller feature to start. Keep the skis parallel and use a narrower stance with more speed over the box.	– Use a wide table style of box (beginners). – Ski parallel along narrow ridges. – Ski with a narrower stance.

MECHANICS OF A STRAIGHT RUN ON A BOX

Approach

- Ski into the box with skis parallel, hip width apart.
- The approach should be on an imaginary straight line through the box and landing.

Take-Off

- Ski up or pop onto box standing centred (middle of foot).

Manoeuvre

- The first attempt at sliding a box should be a straight run.
- Keep a centred athletic stance with the hands forward.

Landing

- Ski out the run-out in same balanced position.

5.5A COMMON INTERMEDIATE EXERCISES

STANCE – INTERMEDIATE

- Ski leaning forward, then leaning backward
- Ultra-slow parallel turns on flat terrain
- Rock forwards & backwards
- Check to see the boots are done up correctly
- Ski backwards with shin pressure

Ankle bounces

Develops awareness and movement of students' ankle joints. Can help with stance, balance, flexion/extension movements etc.

- Stationary - try flexing/extending (or 'bouncing') in the ankles.
- Try the same movement continuously through linked medium sized turns.
- Once students can do the movement accurately, get them to focus on the ankles in their regular flexion/extension movements in each turn. Can be in all sized turns.

Skiing across bumps

To consolidate balance.

- Have the student ski across small bumps.
- Adjust balance by moving the stance forwards and backwards.
- Soft legs to allow the skis to follow the bumpy terrain.

ROTARY – INTERMEDIATE

- Javelin turns.
- Clock face – turn from 10 to 2, or 9 to 3 (imagine a clock face is on the ground and 12 o'clock is always directly downhill, turn the tip of the skis to the numbers for speed control).
- Patient turns from traverse (in basic parallel, rise roll and allow the ski to naturally turn down the hill with some patience, helps stop stemming).
- Linked hockey slips (linked side slipping, Braquage or pivot slips).
- Short turn garlands (garlands are linked half turns that take you diagonally across the hill).
- Hold thigh and twist it whilst skiing.
- Try all forms of rotary; body, hips & legs to compare.
- Japanese heli-turns (pole in back binding & grips forward, like helicopter controls).
- Backwards wedeln, switch snowplough turn.
- Horse and cart (both holding the same poles one leads, while the other follows making short turns trying to slow down the front one who is snowploughing for safety).

Boot arcs

A good leg turning exercise that also promotes skill blending.

- With skis off - practice making an arc or the letter 'C' in the snow.
- Try again with focus on holding the pelvis still. Hips stay still and the movement comes from the thigh. Muscles need to relax around the hip in order for the movement to come from the thigh and not the pelvis. "Grease the hip socket so the leg can twist".
- Aim for making a complete 'C' shape. Start with your heels almost touching but the chosen foot pointing away. This is the bottom of the letter 'C'. Draw the arc in the snow from this point. Feel that the 'C' is scribed by pressuring through the middle of the arch.
- Have a go at making a turn/turns with the C shape feeling.
- Use poles out in front to show correct body position.

Using a bump/roll to help initiate turns

Helps to create a pivot point under the centre of your skis and reduce friction. Great for initiating a parallel turn, making it easier to twist them together.

- Find a knoll or ridge and have the student stand with the middle of both feet on the high point of snow.
- Have students twist both skis with the legs and feet (the pelvis may follow and the student might feel unstable).
- Now have the student place both poles into the snow to anchor themselves whilst tightening the core.
- Ski towards a small bump, extend and twist your legs once your feet are on the top.

Snowplough wedelns

Upper/Lower body separation for short turns.

- Explain how to make short rhythmical snowplough turns (wedeln) with strong leg turning. It's important to stay in a small snowplough as it will hold the hips still as you turn your outside leg.
- Practise some snowplough wedelns with strong leg turning.
- Explain the need for a stable upper body and hips for the legs to work efficiently.
- Repeat snowplough wedelns with stable upper body and strong leg turning.
- Add an active weight shift. Use analogies such as medicine bottle cap or bike pedaling.
- Work into parallel short turns. A roll over in the slope can be effective here so you can SP wedeln on flatter terrain and as it gets steeper, you can transition to parallel.

Targeting exercises (the window frame)

Developing separation and stabilising the upper body.

- Hold a designated object inside the frame made with your poles. Keep the arms in front of the body and not too close to the face.

Hockey stops

Leg turning, upper/lower body separation, balance on the downhill ski and strong edging to finish.

- Start facing down the hill in the bullfighter position.
- Once you have enough forward momentum, extend and twist your legs completely across the fall line.
- A little bit of skidding can be useful before flexing and rolling the ankles/knees uphill to dig in the edges and come to a stop.
- Reach down the hill from your lower ski boot to plant your pole once the skis stop skidding. This will help with upper body stability and balance over the downhill ski.
- The above steps should be broken up and practiced individually in many hockey stops to both sides.

EDGING -INTERMEDIATE

- Alternate between traverse and sideslips
- "Hockey stops"
- Lateral sideslip races
- Crab walk
- Falling leaf
- 360's
- Traverse
- Step uphill, downhill
- Jump uphill, downhill
- Edge-set garlands (edge-set, sideslip combination)

Tug of war

Stronger edging and angulation. Balance on the outside ski.

- Stationary - In partners the downhill skier pulls on the uphill skier's poles trying to pull them down the hill.
- The uphill skier resists by digging the edges in, feeling the stronger grip.
- The instructor should move around the group fixing body alignment/angulation problems.
- Ski some carved medium turns feeling this stronger grip and balance on the outside ski.

Power plough

Earlier, stronger edging. Hip angulation and hip position. Leg turning. Skill blending for carving.

- Try some medium radius snowplough turns to get the students used to being back in the snowplough position.
- Stationary - roll the outside ankle/knee inwards to get some edge grip.
- Try this at the start of your medium radius snowplough turns.
- A stronger leg turning force will be needed to power the ski around on this higher edge (choose a stationary leg turning exercise).
- Have another go at your medium radius power ploughs with strong edge grip and powerful leg turning blended together.
- At this stage you can slide the hips into the turn to create even more edge grip. It's important to stay in the snowplough as the inside ski allows the hips to stay in a good position for hip angulation as well as holding the hips from rotating when the leg is turned.
- Put these sensations into medium radius carved parallel turns.

500 steps

Edging, inclination and simulating crossover.

- Sidestep up the hill a few steps focussing on edging the skis to step-up.
- Make medium turns trying to step uphill above the intended path of the skis through the completion.

1000 steps

Edging, inclination and simulating crossover.

- Medium turns while running on edges.

Lean on poles crossover

To consolidate moving forward and across the skis. Helps gain early edge for carved turns.

- Use flat terrain. Face the skis across the hill and lean on both poles down the hill.
- Have the student move forward and across the skis using the poles for support.
- Be sure the feet roll the skis from edge to edge as the body crosses over.
- Practice linking turns at carved speed on gentle terrain.

Partner crossover

Crossover and early edging in carved medium turns. Feeling the sensation of falling across the skis and moving the body into the new turn.

- Group students into 3's on flat terrain.
- 1 person keeps their skis on (the skier) and stands in the middle of the other 2 people with their skis off (the catchers).
- The middle person assumes an athletic stance and tips the skis to 1 side until they topple into the person (the catcher). The catcher stops them falling over by standing close and having 1 hand on their hip and the other on their thigh.
- The catcher will then assist the skier to topple to the other way by giving them a slight push back to neutral so they fall into the catcher on the other side.
- Once a rhythm is established the catchers can move forward slightly so the movement is across the skis and slightly forward to replicate moving forward in the crossover.
- Move around the groups and correct problems that you see. Trusting your partners will take a few tries to establish and you want to promote moving across the skis not tentatively holding back.

PRESSURE CONTROL - INTERMEDIATE

- Ski over a jump keeping skis on snow.
- Ski with stiff legs (to compare pressure changes to moving legs).
- Ankle bounces whilst turning.
- Keep inside ski off the snow during turns; stork turn, to improve balance and angulation.
- One legged traverses and J-turns.
- Traverse on uphill ski .
- One-legged side-slips.

Pedal turns (bike turns)

Used for weight transfer to the outside ski in intermediate turns.

- Imagine your boots are strapped into bicycle pedals where the outside ski is the one you press on.
- Make sure the timing is correct for the turn type being attempted.

Stationary step-ups

Early weight transfer to the outside ski. Crossover in medium carved/pure carved turns.

- Stand across a gentle slope.
- Take a few side steps uphill focusing on what the uphill leg does or feels.
- Point out that when the uphill leg is placed on the snow to side step-up, the guest should feel pressure under their foot as they begin to press and their leg extends (straightens) as they transfer their weight onto the ski to step up.
- In a traverse; press on the uphill ski and extend the leg before turning towards the fall line (transferring the weight at the initiation).

Modified for crossover in medium carved/pc turns.

- Do above steps but add a roll of the foot from little toe to big toe after the traverse, this will help to move the CoM across the skis.
- Can then be done from a faster traverse.

Stork turns

Can be used for early weight transfer and balance on the outside ski.

- Stationary – lift the tail of one ski. Explain how this shifts the balance to the other foot as well as keeping the balance forward.
- Traverse – lift the downhill tail several times to practice the weight shift. Repeat the other way.
- Traverse again – on the 3rd lift initiate your parallel turn. The timing is imperative "lift then turn". Repeat the other way or in linked turns.
- Try one lift per turn so you are doing linked stork turns.

Swords (double pole drag)

Balance on the outside ski. Stronger edge grip through angulation. Useful to help promote a lower/athletic stance. A great fix for students who bank in steered, carved and pure carved turns.

- Hold the poles like swords (or tennis racquets).
- Ski through a series of turns dragging both pole tips through the entire turn.
- Reaching out to the side will enhance the benefits of the drill.

OTHER EXERCISES

- Human slalom (set the group out and they ski down starting from the top).
- Synchronised skiing.
- Cat and mouse chase. The cat can also be used to get simultaneous edge release in basic parallel turns. Explain that you no longer want the uphill ski, to run first, instead let the downhill (mouse) get away. (good for kids, one leads as a mouse and the other follows).

Side slipping

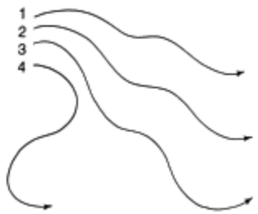
Useful for simultaneous edge release in parallel turns. Descending a section of terrain students are fearful to make turns on. Also good for adjusting a skier's line in situational skiing such as moguls, steeps etc.

- Review the basic position.
- Standing across the hill, leaning on both poles. Step up to the uphill pole, flatten the skis (by rolling the feet/knees) and slide down to the other pole.
- Repeat a few times to get both skis slipping together.
- Try slipping down the fall line without help from the poles.
- Repeat to the other side.

Garlands

Can be used to work on the initiation or completion of any turn.

- Draw a garland in the snow to show students what they look like.
- Explain the technical focus they are to practice and how they will get multiple goes at feeling this movement in a row.
- Tip: garlands can be shallow for slower speeds & can be directed closer to the fall line to gain speed.
- Tip 2: garlands can be built up until they eventually cross the fall line so a new movement pattern (like initiation of a parallel) can be introduced to linked turns.



Following instructor's track

Turn shape, speed control and timing of movements.

- Explain to the student how their skis should stay on top of your tracks.
- Demonstrate how your skis leave lines in the snow so they know what to look for.
- Let them have a go at following you for a few turns.
- Point out the technical focus you want them to think about as they stay on your track and how this will help them achieve it.

Kid's adaptation:

- "You are the pencil and your kids are the rubbers, erasing the line from the snow."
- "You are the engine and everyone else needs to follow the train tracks like the carriages."

Funnel

Converting any medium turn mechanics into a short turn cadence. Also a good warm up exercise for basic short turns.

- Draw a funnel in the snow and explain to students.
- Ski medium turns progressively making the turns smaller as you progress down the run until you are doing short turns.
- Following the instructor can be a useful guide.

Patience turns

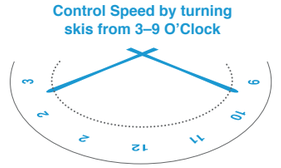
Round turn shape. Gives the skier more time to stay in balance and work on mechanics through the turn as opposed to rushing them.

- Draw the diagram of square turns in the snow. Emphasise that you will try to stay in the fall line as long as you go across the hill.
- Have a try on easy terrain re-iterating the patience to achieve it.
- Follow the instructor's track to smooth the boxes into round turns.

Clock face analogy

Speed control and turn shape. Leg turning.

- Use the clock face diagram to help describe that the ski tips should be turned to 3 o'clock and 9 o'clock. Essentially finishing the turns and controlling their speed.



Clockface Analogy

Dollar bill sign $

Pole plant timing in short turns.

- Draw a line straight down the hill with your poles between your knees.
- Have the guest make short round turns across the line focusing on touching the line on the downhill side as they cross it, creating a dollar bill sign.

6 short 2 long

Develops better rhythm and coordination in basic short turns.

- Challenge students' short turns by getting them to do 6 short turns then 2 longer turns then 6 short turns etc.
- They can repeat this sequence down the run for as long as the terrain and their fitness level allows.

5.6 ADVANCED/EXPERT

CARVED SHORT TURNS

SIMILAR TO STEERED SHORT TURNS BUT WITH MORE SPEED, POWER, AND EARLIER, STRONGER EDGING.

Previous experience

The student will need to able to make solid basic short turns with no obvious skill deficiencies and have an understanding of carving.

Terrain ● ■ ◆

Green terrain is again used to learn how to edge earlier and more strongly. This is then consolidated on blue and later groomed black runs.

Why

- To develop a more powerful, dynamic and exciting image.
- To be able to make short turns on steeper terrain, narrow trails, firmer snow conditions, moguls and variable snow conditions.
- Short turns that tap into the side cut of the ski utilising its design.

MECHANICS OF CARVED SHORT TURNS

Initiation

- The ski's edges grip the snow strongly on a higher edge due to an active ankle/knee roll and the cross over.
- They are then guided from the legs to complement the use of ski design for shaping the turn.

Transition

- From a flexed position, the skier makes a pole swing.
- The skier crosses over their skis to engage a higher edge angle.

Completion

- A flexing of all joints is used to help with carving the outside ski to completion.
- The turn is finished in a countered/ anticipated position, ready to start the next turn.

- Controlled absorption is needed to handle the increase in pressures of the dynamic turn.

Middle

- The upper body is held by the core muscles to remain stationary and facing down the fall line.
- From this strong position the legs are continually tipped onto the edges and guided by a powerful twisting effort under the stationary upper body and pelvis.
- The blending of these movements creates a good basic position that is inclined and angulated more than its steered counterpart (BP).

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Early edging.
- Strong progressive edging throughout.
- Powerful leg turning against a strong/stable upper body and core.
- Controlled absorption.

METHOD FOR TEACHING CARVED SHORT TURNS

Method 1: Snowplough wedeln

Good for upper/lower body discipline or fixing weak rotary

- Warm up with a funnel or doing short turns.
- Snowplough wedeln with stronger edge grip on green terrain by rolling foot/knee.
- Add stronger leg turning to wedeln.
- Wide track parallel short turns on easy blue terrain maintaining the same carving from above exercise (edging followed by twisting is a good cue to think of, even though the ultimate goal is to have them blended).
- Try short turns with more speed and on steeper terrain.
- Strive for as little pivoting as possible and a round turn shape. Emphasise edging first followed by twisting the legs.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Method 2: Skating

Good for increased edge angle but needs good upper and lower body separation

- Warm up with a funnel or doing short turns.
- Skating on the flat, feeling the rolling from little toe (or a flat ski) to big toe to gain edge.
- Skating in the fall line on easy green terrain focusing on the same as above.
- Same as above but funnel in by guiding the skis on the edge with strong leg turning between skates.
- Work into parallel short turns with the same rolling action striving for as little pivoting as possible and a round turn shape.
- Emphasise edging first followed by turning.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Method 3: Edge roll

Good for increasing edge angle

- Warm up with a funnel or doing short turns.
- Short rhythmical edge rolls on green terrain rolling both feet/ knees to gain early edge.
- Crossover with the hips making a more active movement, so that the edging does not come from the feet/ knees only.
- Blend the need for strong leg turn into the edge roll to guide the skis on a high edge.
- Slowly increase the pitch to easy blue terrain to produce more speed, more bending of the ski and hence more deflection. Aid this with the help of a subtle pressure regulation from tip to tail.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Note: this can also be used for slalom style short turns (pure carved).

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KEY POINTS WHEN TEACHING CARVED SHORT TURNS

- The edging should happen as early as possible by rolling the feet and knees in the direction of the turn.
- It is hard to combine the earlier edging with speed control so choose your terrain wisely.
- Keep an eye on student energy and fitness levels.
- Other factors that determine how early the edging takes place in dynamic short turns include:
  - Equipment (side cut)
  - Steepness (too steep= late)
  - Radius (too tight= late)
  - Speed (on flat terrain)
- When teaching guests to carve the skis a substantial increase in edging and angulation is required. Our goal is to let the skis' design help with the direction of the skis, but not to completely take over and have the ski's rail. This greater edging will make the skis tougher to twist to completion and the students need to be aware that they are in for some physical work.
- Powerful short turns produce a substantial build-up of pressure in the turns. A retraction/extension movement is imperative to absorb the rebound and avoid being thrown around. This is where the Centre of Mass remains a similar height above the snow and the skis are carved from arc to arc under the body.

- Due to the increased speed and earlier edging, the skis will travel farther away from the body, requiring stronger hip angulation. The feeling will be one of a loopier turn. Sometimes telling your students to remain patient will help develop the right skill blend between stronger edging and less twisting/rotary (in comparison to the basic short turn).
- A cross-over movement is needed in short turns. A funnel is a good way of introducing carved skiers to the short turn cross-over.

WRITE YOUR OWN PROGRESSION FOR TEACHING CARVED SHORT TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

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COMMON CARVED SHORT TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Heel pushing 	The front of the skis stay close to the fall-line while the tails slide out from side to side, like a car windscreen wiper. This can often result in the student being in the back seat.	Earlier edging. Teach an awareness of the correct pivot point that occurs as a result of early edging.	– Snowplough wedeln – Cowboy turns with edge – Carve the tip of the ski – Edge rolls
Down stemming 	The tail of the outside ski breaks away (downhill) through the turn completion. Usually caused by the stance being too far forward or by hip rotation.	Adjust the stance to stay centered. In particular, focus on the angle of the ankle joint, if too much shin pressure is causing the forward stance (i.e. not relying on the front of the boot). Leg turning/pelvis awareness and position.	– Undone boot turns – Feeling more evenly front and back of the boot (neutral cuff) – Check equipment (i.e. footbeds, forward lean etc.) – Use thigh muscles to stand off the boot in lift lines – Leg turning exercises – Upper body/hip stability exercises – Press shins at a 45' angle rather than forward
Upper body or hip rotation 	Body or hips turn first & faster than the legs/skis. Slower cadence (tempo) to the turns. Weaker edge grip with skis washing out or down-stemming.	Teach leg turning but on an edge for carving. Use exercises that focus on the new movement & also eliminate the old pattern.	– Stationary leg turning exercises. Boot arcs, lift and twist, bow ties etc. – Pole exercises to lock out hips or upper body – Hands on hips – The cage for hip
Upper body tipping	Skier looks over inclined or has no angulation. The shoulders move over the skis directly towards the centre of the turn at initiation.	Angulation & rolling of the ankles/knees first to initiate.	– Swords – Poles held vertically or horizontally to help sense body movement – Pairs feedback – Edge rolls with ankles/knees
Leg action not strong enough	Legs look jello under an unstable upper body	Increase leg speed and intensity.	– Very short, short turns – Shadow/syncro the instructor – Speiss – Fast wedeln – Maximum short turn challenge
Turn shape too elongated	Legs seem to stay under the body & often speed increases.	Round out the turn shape with an efficient X-over of the body.	– Clock face analogy – Follow instructor – X-over with the hips – Use brushes with a race corridor – Corridor skiing drawn in the snow – Syncro skiing

PURE CARVED MEDIUM AND LONG TURNS

A FAST TURN THAT IS PURELY CARVED, WHERE THE SKIS ARE LOCKED ON THE EDGES ALL THE WAY AROUND THE TURN, CUTTING A NARROW, CLEAN GROOVE IN THE SNOW.

Previous experience

Students will need to be able to make controlled medium carved turns on blue/black terrain first. They also need a desire to make higher speed turns than what they already do.

Terrain

The railing exercises that lead into pure carving need to be learnt on green terrain. Due to the fast nature of this turn. Pick an area with little traffic. Only when the students are comfortable railing on the easier green terrain should you move onto blue runs.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Locking the skis on edge (i.e. railing).
- Develop into pure carving by working the ski's design.
- Active cross-over.

Method for teaching the pure carved medium turn

- Warm up with some medium carved turns, challenge the student to ski with maximum edge.
- Stationary - explain the concept of railing and locking the ski on edge. Practice getting the right amount of edge angle for a rail from a wide stance. You can roll the outside leg only to show how to both incline and angulate. Discuss ski design and patience to allow the railing effect to work.
- Single turn, starting across the hill (45°) or a full J-turn, work on railing (repeat to both sides).
- Link on easy terrain (staying near the fall line, if students are comfortable with railing start edging both skis).
- Stationary - introduce and work on an active crossover.
- Practice linking rails again, edging both skis and actively crossing over to get early edge pressure.
- Introduce the idea of varying the radius by increasing the edge angle through the turn.
- Link turns on slightly steeper terrain (easy blue) and try to tighten the radius.
- Emphasise the need of both a well-angulated hip position, strength in the outside leg and inclination to get enough edge.

Why

- To experience the exhilarating sensation of a pure carved turn.
- To be able to ski faster, in control.
- To be able to ski faster through a racecourse.

MECHANICS OF A PURE CARVED MEDIUM TURN

Initiation

- The edges of the skis are locked into the snow via the active cross-over movement.
- The skier's centre of mass can move further to the inside than a carved turn due to the increased speed and edge grip they are balancing against.
- An extension of the body lengthens the joints particularly of the outside leg, allowing the skier to weight the newly engaged outside ski well before the fall line.
- Depending on the speed being travelled, some inclination of the whole body is productive during this phase of the turn to achieve the above mechanics.

Middle

- Progressively increasing the edge by creating more angulation, especially at the hip. This occurs best by holding the upper body and core strong, allowing some counter to develop as the inside half moves forward. Bending at the waist as the legs tip in will create the angles.
- A change in the independent leg length is required. Lengthening the outside leg resists the centrifugal force while shortening the inside leg allows the hips to move into the turn and keep the weight balanced on the outside ski.
- The blending of these movements creates an inclined and angulated basic position (BP).

Completion

- Edge angles are continually increased to work the skis to the desired turn shape.
- The outside leg remains long until such time that absorption of pressure is required. The bending of the ski's design throughout this turn will require a substantial retraction of the legs to absorb and control the developed pressure.

Transition

- The skier is in a lower position as a result of absorbing the skis' energy when exiting the previous turn and in an effort to actively cross-over.
- The body/ Centre of Mass actively crosses-over the skis, moving directionally forwards and across so that the skier can catch up to their feet. This movement of the body will result in a powerful high and early edge angle.
- Balance on the new outside ski is established.
- A pole swing is often used here to help with the active cross-over movement.

KEY POINTS WHEN TEACHING PURE CARVED MEDIUM TURNS

- The first goal is to rail from one turn to the next without applying a twisting or guiding force to the skis. Next the student should try to tighten the radius of the turn by getting the skis to bend.
- Teach your students to stand up to flatten the skis if they need to get off the edge to avoid something as a safety precaution.
- There is a strong active cross-over movement in these turns and the feeling of falling into the turn, as you cross-over, is both a scary and exhilarating one.
- Do lots of exercises to encourage moving into the centre of the turn e.g. rubbing inside hand on the snow and banking exercises.

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- The aim is to teach guests to vary and tighten the radius of the railed turn by:
  - Achieving even more edge angle at the start of the turn, with early pressure on the outside ski, by using an active cross-over movement.
  - Increasing the edge angle through the turn by inclining the whole angulated position (progressive edging). The greater the edge angle the tighter the arc the ski makes.
  - Actively resisting the centrifugal force by keeping the outside leg strong. This strength is gained through muscle resistance and hip angulation.
- Rhythmical, flowing movements both through the turn and from one turn to the next. Remind the guests of the importance of a pole touch to aid this. The faster the rhythm, the tighter the turn radius will be.
- Pressuring the front of the ski at the start of the turn through the use of leverage and body direction in the cross-over (more applicable for high level instructors and racers). All of the above points constitute working the ski, as opposed to remaining static on the skis.

COMMON PURE CARVED MEDIUM TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Weak edging 	Skier is having trouble pure carving and the skis either carve or skid.	Check for a correct stance. Use the railing sensation and exercises to develop an awareness of when the student is "locked on edge".	– Stationary - show edge grip with a snowplough or herringbone position, explain the feeling of pressure under the foot. – Railing on gentle terrain. – Increase the amount of inclination of the angulated position. – Try a ski with a narrower waist or increased side cut.
Radius too long (railing - ski are not being worked) 	Very large turn shape, static ski position & not much pressure build up. Often called park & ride.	Tightening the radius by getting the ski to bend. •Progressive edging •Strong outside leg •High, early edge •Moving forward •Rhythm	– Stationary tug-of-war. – J turns with progressive edge. – Stronger more directional X-over. – White pass exercise. – Use a tight rhythmical race courses. – Scholpy turns. – Pure carved snowplough, In-rigger turns.
Falling in at the start of the turn 	Loss of balance at the start of the turn can result in either a white pass or falling.	Controlled/slower turn transition. Use angulation in the crossover.	– Work on controlling pressure build up from previous turn. – X-over slightly more forward, not directly downhill (move with the skis). – Doorway x-over with angulation. – Swords.
Squaring up	The skier's upper body and shoulders will face directly where the skis are going. Not much hip angulation will be formed.	Develop counter through the turn at the hips. Passive leg turning and upper body discipline.	– Heisman drill. – 1 pole swords. – White pass (stopping early counter). – Strong core. – Vision downhill. – Gentle edge rolls with hands on hips.

WRITE YOUR OWN PROGRESSION FOR TEACHING PURE CARVED MEDIUM TURNS

(Use the above method and relevant exercises/analogies and tactics)

SITUATIONAL PROGRESSIONS

MOGULS- SKIING A LINE

A 'LINE' IS A WELL-DEFINED GROOVE DOWN THE FALL LINE BETWEEN A SERIES OF REGULARLY SPACED MOGULS.

Previous experience

Guests need to be willing to ski a mogul field, have the ability to make controlled short turns (preferably carved) and have experience skiing on the top of spaced moguls.

Terrain

Green to blue terrain with regularly spaced moguls is best to start with. Use short sections of a line with a clear run out.

Why

- **Skiing in the line allows you to control your speed by using short turns in the fall-line.**
- **It's the starting point to advanced moguls and once you are used to staying in a line with control you can then learn to ski faster and use absorption to maintain balance.**

MECHANICS OF SKIING A LINE IN MOGULS

Using a well-shaped, regularly spaced line; the guest makes steered or carved short turns around each mogul. The shape of each mogul will determine the need for either an offensive round turn or a more defensive hockey stop turn. A pole plant is placed towards the top of the mogul to aid rhythm and stability to the upper body.
A slight rising to re-centre through the transition is still used as the speed travelled should be kept down due to controlled turns, therefore, the need for absorption is not yet required.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Short turns around the moguls, skiing in the troughs.
- Blocking pole plant.
- Speed control in varied terrain.

Method for introducing a line in the moguls

- Warm up doing short turns.
- Explanation of making short turns in the 'line' or troughs. Find an easy line and show (or draw with a pole) the exact line.
- Short turns in this easy line (6 turns) focusing on quick turns and speed control. Pick a line that is well-spaced and easy to control the speed (preferably with a run-out).
- Hockey stops around some easy bumps for control. Add in blocking pole plant to finish for stability.
- Practice controlled short turns in slightly more difficult lines with more turns.

KEY POINTS WHEN TEACHING A LINE

- The line may be explained as the path water would follow if poured down a mogul slope.
- Use short turns, you ski around the moguls by staying in the troughs.
- Watch that the students do not get too tired making short turns in moguls.
- Hockey stops can be a very useful warm-up for controlled mogul skiing in a line.
- It is useful to work on short turn technique outside of the moguls (e.g. for a warm up) and then work on mogul skiing technique/ tactics once in the bumpy terrain.
- Passive absorption may be involved to help maintain balance as the student becomes comfortable.

COMMON LINE PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Cannot hold a line 	Skier can only link a few turns before losing the line.	Check the student has the skill to make short turns in the fall line on a groomed run. Show where the line is.	– Walk the skier around the line. – Find short easy lines with 5-6 moguls & a run-out. – Use dye to show the line. – Analogies such as "water travels around the moguls". – Use freestyle max to explain the line.
Sliding down the sides of moguls	Skis are flat and sideslipping. Skier initiates on top (like intro to moguls) and slides down the side into the trough.	Rounder turn shape the skis are kept away from the moguls. Increase edging to hold the line.	– Steer around the bumps. – Tips lead, tails follow. – Follow instructor. – Single turns to a stop (edge control).
No speed control 	Skier either becomes faster & faster or pulls out of the line after a few turns.	Speed control in the moguls.	– Find smaller moguls/easier terrain. – Hockey stops on the back of moguls. – Steer or carve a rounder line. – 2 turns per bump. – Clock face analogy. – Early pivot and skid down the back. – Follow the instructor.
Skis are too far apart 	A large gap between the legs. Legs are different lengths, one leg on top of mogul with other down in the trough. Balance will be thrown around laterally.	Teach a narrow stance.	–Traverse with narrow stance. –On groomed ski holding a glove between the knees. –Stork turns on groomed with lifted ski held near other knee.
Pole plant	Incorrect timing of pole or placement. Skier may hold onto the pole plant too long causing upper body rotation.	Remind students when and where to pole plant i.e. slightly on down hillside of mogul if possible.	– Single turns or short line to show where to pole. – Punch pole after planting to move forward.

MOGULS-ABSORPTION

ADVANCED MOGUL SKIING INVOLVES MAKING FASTER SHORT TURNS IN THE FALL LINE OF A MOGUL RUN WITH GOOD ABSORPTION.

Previous experience

Guests need to be able to make strong, rhythmical short turns in control on blue/black runs. They also need to have some experience skiing short fall line sections of moguls at slower speeds i.e. intermediate moguls.

Terrain ■ ◆

Best taught on blue terrain with round, well-spaced 'lines' and softer snow. Steeper runs, tighter lines and larger moguls can be tried out as the skill level improves.

Why

- It's one of the most challenging and difficult aspects of skiing. Being able to ski moguls well is a true indication of your expert level of skiing.
- The skills required to maintain balance in moguls are also used to ski other challenging, off piste terrain, like powder and crud.
- Skiing the fall line at speed requires an active retraction/ extension movement to remain in control.

MECHANICS OF ADVANCED MOGUL SKIING

Initiation

- Just after the skier retracts to absorb the bump there will be a light point from where the bump drops away. The legs must extend to regain snow contact and start to develop some edge grip and balance on the outside ski.
- During the extension, the ski tips dive in order for the skis to follow the contours of the snow.

Middle

- The legs continue to full extension developing even greater edge angles and contact with the snow.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- At the point of maximum extension the legs and upper body are tall, ready to absorb the next mogul.

Completion

- The feet are pushed ahead slightly just before impacting the next mogul.
- Both legs relax and start flexing to control the build-up of pressure delivered by the next bump.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around.
- At the point of maximum absorption the hips are lower than the knees and the thighs almost hit the chest.

Transition

- When the legs flex to absorb the pressure built up from impacting with the bump, the body moves across the skis.
- A blocking pole plant on the top/ downhill side of the bump stabilises the upper body.
- As the body crosses the skis and enters the new turn, the legs will begin to extend into the trough.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Absorption over the bumps
- Extension into the troughs
- Dynamic balance and/or leverage to keep ski tips following the contours of the terrain

Method for teaching advanced mogul skiing

- Warm-up with fast short turns on the groomed and then check the group can ski linked turns in a moderate line (intermediate moguls).
- Explain the stance needed for absorption as the speed increases and/or the bumps get bigger. Ski upright in the hip and flexed at the ankle.
- Stationary - lean on the poles, move one leg up and down to get a feeling for the movement of absorption.
- Traverse through bumps (ideally bigger bumps that are spaced) focusing on the correct absorption technique, can be done with speed.
- Work independently on the flexion stage or extension phase on single bumps.
- Attempt an easy line with short turns and absorption.
- At first keep ski to snow contact by pulling the feet back under the CoM when absorbing.
- Practice versatility.

KEY POINTS WHEN TEACHING ADVANCED MOGUL SKIING

- Avoid big moguls if they are icy.
- Make sure you confirm the student's standard to choose the appropriate terrain.
- Making short turns in a line is easier to learn than making short turns in a line with absorption. Absorption is introduced when the students are comfortable skiing faster in the line.
- The feet are pushed ahead slightly just before impacting the next mogul and, as the skier passes over the mogul, the upper body is moved forward to avoid being left behind (somewhat like pedaling a bicycle backwards).
- You will need to spend time practicing the absorption separately before combining it again with short turns in a line.
- As bumps become larger and more distinct, it becomes more difficult to dictate your own path through the moguls. The moguls start to dictate where you turn i.e. through the troughs.

Dolphin turn

Ski-to-snow contact

COMMON ADVANCED MOGUL SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Not enough Absorbing 	Student is jolted, rises or loses control when hitting a bump. The skis may leave the ground after the bump. Skier's legs stay the same length throughout the turn.	Range of movement (retraction/extension with the legs). Where and when to do this in the bumps.	– Stationary extension/retraction for range. – Extension/retraction turns. – 1 Bump Extension. – 1 Bump Retraction. – Traverse in the bumps with absorption. – Drunken Sailor exercise.
Not enough extension	Skier shows active absorption but still has a loss of ski to snow contact while moving into the trough. They may either stay low or get lower as they ski down the run.	Get the student to open the ankle and push the ski tips into the trough. Work on active extension to maintain ski to snow contact.	– Traverse in the bumps focusing on extension and ski to snow contact. – See-saw or toe-tipping explanations. – Dolphin turns.
Absorption from upper body, not the legs. 	Upper body collapsing at the waist as the skier hits a bump. Skier's legs stay the same length through the turn.	Range of movement/ absorption with legs while the body stays strong. Mogul's stance (flexed ankles and knees, more upright at the hips). Strong core and upper body stability.	– Traverse with quiet upper body (analogy: like pedaling a bike backwards). – Extension/retraction turns. – Practice in smaller bumps. – Jump turns or Speiss on groomed. – Short turns with core activation. – Stationary mogul's stance. – Partner push and pull with hands to feel timing for absorption. – Jump into a bump with feet in front (open hip), back upright, absorb with legs.
No Speed control	Skier gaining speed down the hill.	A certain amount of absorption will slow the speed of the CoM down the fall-line.	– Where to approach or hit the bump in the turn transition. – Dryland: jumping downstairs to slow the descent each absorb. – Backwards bicycle pedaling. – Practice versatility change lines, turn shape & size.

WRITE YOUR OWN PROGRESSION FOR TEACHING ADVANCED MOGULS

(Use the above method and relevant exercises/analogies and tactics)

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SKIING ICY CONDITIONS

Icy conditions are not uncommon in Australian resorts. Warmer temperatures during the day followed by below freezing temperatures at night, can produce hard conditions in the morning. Skiing these icy conditions can actually be a good challenge, so long as the following tactics and safety considerations are heeded.

Tactics and safety considerations

- The most important factor is to maintain sharp edges. If your edges are sharp you can make good quality turns on the hard surface. If they are not, you are forced to make skidded turns with less control over your direction.
- Never take your skis off if you lose your confidence on the run. Instead, side slipping down the run will have much more control.
- Choose easier terrain.
- On ice it can be more difficult to change direction or pull up quickly. Keep the speed down to avoid collisions with other skiers or objects, especially when skiing down towards the group. As always, have the students stop below the group.
- Avoid skiing icy areas with rock outcrops or trees, although sometimes the snow in the off-piste areas can be less icy.
- Incorrect stance problems are accentuated on the hard surface. Too far forward and the back of the ski will wash out. Too far back and it will be difficult to finish the turns and control the speed.
- If you do fall on an icy run, try to keep the skis below you so that you can dig the edges in to slow down.

The technique or method for skiing ice is the same as for softer snow but with more emphasis on:

- Keeping the skis wider apart as it's better for balance and edging ability.
- Keeping all the body weight on the outside ski so that it penetrates the hard surface and grips more easily.
- Look ahead for patches of soft snow or search on the sides of trails where it tends to land from other skier's spray.
- For longer turns, be smooth and soft on your edges as abrupt movements tend to send you sliding.

Notes

RETRACTION/EXTENSION TURNS

TURNS MADE WHERE THE UPPER BODY STAYS AT THE SAME HEIGHT ABOVE THE SNOW WHILE THE LEGS RETRACT AND THEN EXTEND AWAY FROM THE BODY.

Previous experience

It is desirable if the student has had experience making carved medium radius turns on a blue/black run or mogul skiers looking to gain more speed and balance in the fall line.

Terrain

Best taught on blue terrain. Utilise bumps, knolls and spines to help learn the timing and feel of the movements.

Why

- **The retraction/extension movement is used in advanced bump skiing to absorb the bumps.**
- **It is also required in dynamic long and short turns to assist with pressure control that is built up from the dynamics of the turn.**
- **If skiing fast through the powder and crud, this movement is also used to help maintain balance and to increase turning power.**

Initiation

- After the skier retracts to absorb the previous turn's pressure, there can be a light point just like absorbing a virtual bump. Therefore, the legs must extend to regain snow contact and start to develop some edge grip and balance on the outside ski.
- The CoM continues to move to the inside of the turn.

Completion

- Edge angles are continually increased to work the skis to the desired turn shape.
- Both legs relax and start flexing to control the build-up of pressure.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around. This will keep the CoM relatively low.

Transition

- The Centre of Mass (CoM) stays low during the cross-over. When the legs flex to absorb the pressure built up from the previous turn, the body moves across the skis without extending straight up.
- As the body crosses the skis and enters the new turn, the legs will begin to extend to the other side.
- The pole swing happens through the absorption phase and will be planted while the skier is quite low.

Middle

- The legs continue to full extension, developing even greater edge angles and build up of pressure.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- The blending of these movements creates an inclined and angulated basic position (BP).

MECHANICS OF A RETRACTION/EXTENSION TURN

The aim of this turn is to practice the movements required to control pressure changes in medium radius carved turns. The object is therefore, not to allow the Centre of Mass to move but rather stay at the same height above the snow.

Using spines and bumps is the easiest way to practise the timing of the retraction/ extension movements.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Retracting through the completion.
- Extension of the legs and body after the initiation into the middle of the turn.
- Timing of these movements in situational skiing (i.e. moguls, pure carving, powder etc.).

Method for teaching retraction/extension turns

- Let the group warm up trying to have a go (keep CoM low and at the same height).
- Explain the R/E turn and the needed timing.
- Work on the retraction phase, during the edge change.
- Work on the extension in the middle of the turn.
- Try individual full turns combining the retraction and extension movements (e.g. upside down question mark turn).
- Try linked R/E, maybe crude to begin with, work on timing.
- Consolidate by working on ski performance and timing of the skills.

KEY POINTS WHEN TEACHING RETRACTION/ EXTENSION

- The retraction/extension movement is one of the most difficult yet crucial skills for advanced skiing. Without it, dynamic mogul skiing is out of the question, powder skiing is not as balanced and smooth, and dynamic short turns on the groomed are difficult to control.
- You must choose the appropriate ski performance for your guest's intended goals or outcomes. Teach a pure carving method for those wishing to control pressure while racing OR teach a carved method for those wishing to ski better in the moguls or off piste.
- Practicing on groomed terrain is a good way to show an understanding of pressure control.

Bumps aid the retraction.

A pole can be used to practice staying low through the transition

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COMMON RETRACTION/EXTENSION TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Rising centre of mass 	Upper body rises through the transition into the turn initiation.	Transition and edge change from a low position.	– Use the ceiling analogy – Ski under the instructor's pole – Swords (holding poles half-way) – Low traverse/side slip garlands – Edge rolls in low position – Practice on small knolls or spine
Timing incorrect	Retracting or extending too quickly or at the wrong place in the turn.	Explain why the student has to retract/extend and where this has to happen in the turn.	– Draw the movements in the snow – Use a spine to timing – Drunken sailor to help feel the pressure – Low position edge rolls into a reverse funnel – Try doing it more slowly/smoothly – Count out the movement
Not enough range of motion	Skier looks as though they are just skiing in a low position and the legs do not lengthen.	Teach the crude movements first to show how much is needed then work on timing.	– Traverse with quiet upper body (analogy: like pedaling a bike backwards) – Extension/retraction turns – Practice in smaller bumps – Jump turns or Speiss on groomed – Short turns with core activation – Stationary mogul's stance – Partner push and pull with hands to feel timing for absorption – Jump into a bump with feet in front (open hip) back-up right, absorb with legs

WRITE YOUR OWN PROGRESSION FOR TEACHING EXTENSION/RETRACTION TURNS

(Use the above method and relevant exercises/analogies and tactics)

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ADVANCED RACING

INCLUDES ORGANISED RACE EVENTS SUCH AS INTERSCHOOLS, MASTERS AND ANY TRAINING WHERE IMPROVING PERFORMANCE BECOMES IMPORTANT.

Previous experience

Students should already have race experience and be able to do a carved parallel turn at a minimum.

Terrain ■

Best terrain is an easy blue 'NASTAR' style course or set a GS type course on a run that is roped off from the general public.

Why

- **Racing is a fun pastime but once the student starts to treat racing as a sport then performance becomes important.**
- **It does not necessarily relate to winning but can simply come down to improving personal performance.**
- **Ski racing can also improve carving and general skiing under a different environment.**

MECHANICAL SKILLS NEEDED FOR ADVANCED RACING

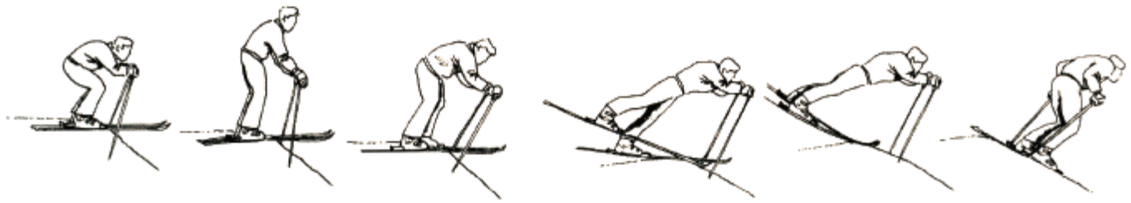
- **Mechanically a pure carved turn is fastest, but some pivoting technique at the top of the turn may be needed to set a good line.**
- **How to do a fast start.**
- **Skating may be needed.**
- **An understanding of a fast 'line' both a high line for more time in the fall-line and a tight line for aggression.**
- **Tactics for finishing the race and improving performance.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **Improved starts**
- **Improved finish**
- **Improving the line with the goal of increasing speed**
- **Improving performance with the goal of increasing speed**

Method for teaching advanced racing

- **Safety should be the first priority.**
- **Warm up with either dynamic medium turns or medium carved turns, depending on your guest's ability. Use exercises to target skill deficiencies.**
- **Inspect the course and re-explain the concept of line.**
- **Use markers (stubbies or cones) at this point to practise a fast early line.**
- **Work on starts and the finish.**
- **Add timing and work on performance in the course.**
- **Remove students from the course at any time to correct movements in their performance skiing. Then try integrating this faster technique back into the course and line previously worked on.**

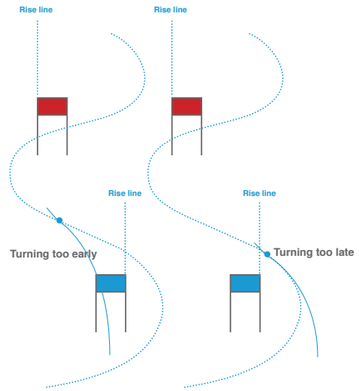


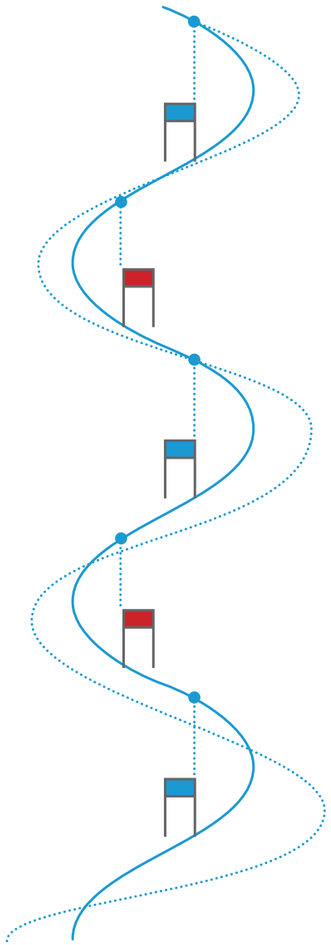
Key points when teaching advanced racing

- Improving performance for racing is all about improving speed or time. This is achieved both through an improved line and ski technique, in and out of the course.
- Better to challenge with exercises than terrain.
- Students should know what to do in the event of a fall (get out of the way etc.)
- You need to help keep the course in good condition by working as a slipper THAT INCLUDES YOU!
- Side-slipping provides a good chance to explain various lines.
- Advise the student to wear a helmet.
- Never run a course while it is being set up.
- Be aware of mechanised vehicles on and near the course.
- When using screw-in gates make sure they are screwed in below the snow surface. If the base is above the snow, a fall onto the gate could cause an injury.
- Make sure the turning side of the flag/panel is not tied on. This is so that if you catch your arm on the gate then the panel will come off.
- The entire course including the finish area must be roped off from the public.
- There should only ever be one racer on course at a time.
- Monitor your student's fitness and energy levels, training should include a warm-up and cool down. In some instances the sport specific training may only include 2-3 full race runs.

COMMON ADVANCED RACING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Racer is having trouble holding the line	Slides off the line ending up too low to make the next turn or even skis out of the course.	Check equipment and set. Work on stronger edging through the turn. Reduce the ski performance to exaggerate the line then gradually build back up.	– Have skis tuned. – Work on pure carving out of the course. – Set a rounder course. – Set brushes showing where to X-over & engage edges (rise line).
Trouble staying on the right line	Skier aims at the next gate and rushes the turn. Skidding will occur and perpetuate the problem.	Re-explain the 'rise line'	– Use dye to mark the rise line or aiming point. – Use brushes for helper gates with the line. – Follow the instructor .
Railing the course	Skier does not get the ski to bend enough & starts to run straighter & faster (loses control or line). Has trouble setting the line at the top of the turn.	Work on pure carving (working the ski) in the course, may need to set the correct steering angle before working the ski.	– Take racer out of the course to work on turn shape. – Use markers to round line-out & pure carve back at the gates. – Practice setting a steering angle out of the course & implement later in with markers. – Ski a brush course first with pure carving.
Fear of the gates	The skier may be on an early exaggerated line but it is too wide/far away from the gates.	Bringing the line closer in to the gates by building confidence. This will increase the overall speed and reduce the skier's overall time.	– Ski brushes and stubbies first. – Angle gates away from the skier (to the inside of the turn). – You can build a mixture of the above sets to help bring in the line and reduce fear of the gates.





Tactics are important in racing and despite the standard of the instructor or your guest, learning the line through a race course and how to use the rise line can be very advantageous for a fast time.

What is the Rise line?

The rise line is an imaginary line that rises up the fall line from the flag. It is a rough indicator for the racer to start his/her turn. Racers talk about being "patient" across the hill until they reach the rise line to initiate their turn.

Starting the turn before the rise line may send the skier directly at the gate resulting in a low line below the gate.

Equally, turning too late, after the rise line will send the racer too far away from the gate.

Variable terrain can change the line you take through a course, for example, on steep terrain starting the turn high on the rise line is needed while on the flat, taking the turns straighter and lower on the rise line. There are times when a sharp/tight change in direction is needed and it is necessary to start the turn after crossing the rise line in order to complete the turn at the gate. This tactic is known to racers and coaches as a "come from behind" manoeuvre. To practice how the rise line can work for you, spray a paint line above the gate and try to turn on that line while racing the course.

WRITE YOUR OWN PROGRESSION FOR TEACHING ADVANCED RACING

(Use the above method and relevant exercises/analogies and tactics)

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PURE CARVED SHORT TURNS

SHORT RADIUS TURNS THAT ARE PURELY CARVED. THE SKIS ARE LOCKED ON THE EDGE ALL THE WAY AROUND THE TURN, CUTTING A NARROW, CLEAN GROOVE IN THE SNOW WITH ZERO SKIDDING.

Previous experience

Students need to be able to make controlled short carved turns on blue/black terrain first. Understanding a pure carved medium turn and the premise of locking the skis on edge. They also must have a desire to make higher speed short turns.

Terrain

The railing exercises that lead into pure carving need to be learned on green terrain. Pick an area with little traffic to do the railing exercises. Only when the students are comfortable railing on the green terrain can you move on to blue terrain.

Why

- To experience the exhilarating sensation of pure carved short turns.
- To be able to ski fast and in control on groomed terrain.
- To be able to ski faster through a slalom racecourse.

Method for teaching pure carved short turns

(Edge roll method)

- Warm up with a funnel or doing short turns.
- Fast, rhythmical, pure carved edge rolls on green terrain rolling both feet/knees.
- Cross-over with the hips making a more active movement, so that the edging does not come from the feet/knees only.
- Slowly increase the pitch to easy blue terrain to produce more speed, more bending of the ski and hence more deflection. Aid this with the help of a subtle pressure regulation from tip to tail.
- Explain and practise the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving pure carved mechanics and working the ski.

Initiation

- The skier's legs extend from the flexed position through the transition. The legs must extend (in particular the outside ski) to regain snow contact and start the development of edge grip and balance on the outside ski.
- The Retraction/Extension movement sets the body up for higher edge angles and increased inclination through both the initiation and into the middle of the next turn.

Transition

- A pure carved short turn has a rapid build-up of pressure from the dynamic combination of speed, high edge angles and a substantially shorter radius.
- The Centre of Mass stays relatively low during the cross-over when the legs are flexing to absorb the pressure built up from the previous turn. As this flexing of the legs occurs, the upper body actively crosses over the skis directly towards the centre of the next turn.
- The pole swing happens through the absorption phase and will be planted while the skier is quite low. The plant can either aid in stability of the body at the end of a dynamic turn or at the start, to assist with body direction into the new turn.

Middle

- The legs continue to extend developing even greater edge angles and build up of pressure.
- Discipline is maintained with the upper body facing the shoulders and chest down the fall line.
- A progressive increase in edging continues through a blend of knee and hip angulation.
  The speed and rhythm in which this takes place is significantly faster to tighten the radius.
- The blending of these movements creates an inclined and angulated basic position (BP).

Completion

- Both legs relax and start flexing to control the rapid build-up of pressure.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around.
- The upper body continues to stay facing down the fall line while the legs are pure carved towards the initiation of the next turn.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Active cross-over movement.
- Faster implementation of progressive edging.
- Retraction/extension movements for absorption of pressure.

MECHANICS OF PURE CARVED SHORT TURNS

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KEY POINTS WHEN TEACHING PURE CARVED SHORT TURNS

- Slalom style skis with a tighter radius will make this turn more achievable.
- Teach your students to stand up and flatten the skis if they need to get off the edge to avoid something.
- The skis should be kept wider apart to help aid balance as a result of the higher speeds.
- Retraction will often be needed to deal with the increase in pressures of the turn.

COMMON PURE CARVED SHORT TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Weak edging	Skier is having trouble pure carving and the skis either skid or carve.	Check for a correct stance (slightly lower). Make sure the student is aware of the railing sensation & the concept or zero skidding.	– Railing on gentle terrain – Increase the amount of inclination of the angulated position – Try a ski with increased side cut – Edge roll exercises on easier terrain – Reverse funnel on easy terrain
Turn shape too elongated	Legs seem to stay under the body and the speed often increases. Looks more like a rail than a pure carve.	Round out the turn shape with a more active X-over so the skier can move further into the turn. Progressive edging and rhythm.	– X-over with the hips – Use brushes with a race corridor – Try a ski with increased side cut – Release the turns sooner to keep a quick constant rhythm
Unable to control pressure form the turn 	Skier either gets shot into the air or does an unwanted white pass. Balance will be lost and often the turn radius will increase.	Pressure control through the end of the turn allowing the skis to cross under the body without disrupting balance.	– Use drunken sailor to understand pressure build-up – Work on controlling pressure build up from previous turn – X-over slightly more forward, not directly downhill – Ext/Ret short turns – Dolphin turns
CoM left behind	The skier's body gets left behind as the skis travel faster down the hill. They are unable to effectively move across the hill, speed control is often lost.	Moving forward/down the hill in the transition. Earlier tip pressure & working through the middle of the turn.	– X-over exercises – Allow skis to travel under CoM through end of turn – Dolphin turns – Use leverage to get the tip to engage

WRITE YOUR OWN PROGRESSION FOR TEACHING PURE CARVED SHORT TURNS

(Use the above method and relevant exercises/analogies and tactics)

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STEEP SKIING

GENUINE STEEP SKIING IS ON TERRAIN THAT HAS 40 DEGREES OF STEEPNESS OR MORE.

Previous experience

Best taught to guests who can do dynamic short turns with control on black runs and have a desire to ski steep terrain.

Terrain ■ ◆

The technique for skiing steep terrain has to be learned on easier terrain first. Blue terrain is ideal to start with, followed by groomed black runs and then shorter, steep pitches with a good run-out.

Why

- The challenge of skiing steeper terrain is a thrill and an adrenalin rush.
- Skiing a steep chute could be compared to the rush of bungee jumping.
- Advanced skiers may need to use it to get down a small section of an 'off-piste' slope.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety in the steeps
- Speed control
- Faster Initiation with up motion using varying amounts of initial steering angle
- Strong completion with a solid edge set
- Reaching pole plant downhill from feet

MECHANICS NEEDED FOR STEEP SKIING

The movements on steeps are the same as short and medium turns. However, the skier now has to use a more defined up motion to make the turn initiation easier and quicker so they don't build up too much speed.

For speed control the skis are guided by the legs across the hill, enough to slow down. Strong edging during the completion of the turn using the ankles and knees grips the skier to the steep slope, while the upper body angulates over the downhill ski for balance. The skier should reach for their pole plant downhill from their boots to hold this angulation and aid commitment to the next turn.

METHODS FOR TEACHING STEEP SKIING

Method 1: Hockey stop

Speed control technique used on steep black runs.

- Review hockey stops on moderate terrain. Stress the need to turn the skis right across the hill with a good edge set and a solid pole plant.
- Short turns with a strong up motion, later edging, strong finishing and pole plant.
- As the students become more comfortable with the terrain, reduce the amount of up motion.

Method 2: Soft Speiss

If steeper black runs are available that require turning in the air.

- Try jump turns on blue terrain (soft Speiss small turn in air steered or carved finish).
- Try these turns on a short steep slope with an easy out-run.
- Traverse between the turns to start with, then link the jump turns continuously.

Method 3: Hard Speiss

Used for extreme steepness

- Stationary - practice hopping in the air. Focus on flexing and extending all three joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first, to make it easier for a novice at Speiss turns.
- Move to an easy slope so the skis don't slide too much and try linking a couple of turns each way.
- Add in a solid pole plant to help with stability and timing.
- Try on steeper slopes that will require a greater range of twisting.

KEY POINTS WHEN TEACHING STEEP SKIING

- Shorter radius turns with a strong up motion are the most appropriate mechanics, a solid pole plant and a later but strong edge set to finish the turns, will control the speed.
- Initially avoid steep terrain with obstacles and avoid steep terrain if the conditions are too icy.
- Always assess fall zones in the steeps and avoid areas where skiers could fall and potentially slide into a hazard.
- Teaching self-arresting is imperative before heading into steep dangerous terrain where someone could fall and slide a long way.
- Jump turns are very tiring; keep an eye on the fitness level of your students.
- The amount of up motion depends on the steepness of the terrain and the skill level of skier.
- When the terrain becomes extreme in steepness the skis are jumped off the snow, turned in the air completely across the fall line and edged strongly on landing. The skis are literally jumped from one edge set to the next.
- An expert skier combines the jumping with a retraction/extension movement. As the skis are jumped off the snow, the legs retract quickly, turn in the air, extend to regain snow contact and absorb the landing.
- You need a strong pole plant that is planted further down the hill to help commit to the next turn. It helps project the body down the hill when you jump, provides support and assists with the unweighting.
- Placing the pole further down the hill helps to give the skier a more angulated position thus giving them better pressure control by balancing over the downhill ski.

COMMON STEEP SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Fear	Leaning back or into the hill. Large traverses and balking at the initiation.	Take to easier terrain & work up to steeper to build confidence. Stemming to help start the turns.	– Stem Christies up-hill for initiation. – Lift the skis tail slightly when jumping (careful not to catch tip-use appropriate terrain). – Do edge set jumps down the slope. – Garland hops. – Reaching pole plant down hill.
Weak edging	Skidding at the end of the turn, loss of turn shape and balance in bumpy terrain.	Strong angulation and edge set.	– Hockey stops on steep terrain with strong edge set & pole for balance. – Do edge set hops down the slope. – Speiss turns landing on the edges (hard Speiss). – Edge set garlands. – Side slip edge sets. – Reaching pole plant down hill.
No speed control	Skier gets faster & faster & may end up in the back seat.	Turn shape to control speed on easier terrain and work up to steeper terrain. Quicker initiation to get the skis around faster.	– Clock face analogy. – Hockey stops. – Short single J-turns or ?-turns. – 180° Speiss. – Re-visit jump turns.
Poor pressure control	Skier lands with stiff legs, breaks at the waist, becomes unbalanced or wobbly.	Focus on proper absorption or softening the legs during landing.	– Hockey stops on flatter terrain building up to the steeps. – Speiss landing soft. – Retraction of the legs after the initial jump. – Edge set jumps down the slope landing soft. – Jump turns focusing on pulling the skis up off the ground after the initial jump.
Upper body rotation	Upper body swings around during the jump.	Leg turning and strong separation.	– Vision focus exercises. – Leg turning exercises on the groomed. – Strong pole plant for stability. – Pole plant placement to block u/b rotation. – Don't hold onto the pole plant too long .

WRITE YOUR OWN PROGRESSION FOR TEACHING STEEP SKIING

(Use a combination of the above methods and relevant exercises/analogies and tactics)

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POWDER SKIING

SKIING IN VARIOUS DEPTHS OF NEW OR UNTRACKED SNOW.

Completion

- The completion of the turn happens much sooner as the snow's surface helps to control the skier's speed by packing against their legs. Therefore, a finished turn will slow the skier down too much and be difficult to get the next turn started.
- The skier starts to flex during this phase to generate more powerful leg turning through the thick and sometimes grabby snow.

Transition

- From a flexed position on compacted snow the skier rises sharply bringing the skis to the top of the deep powdery surface. At first, it is almost like a bouncing or hopping move which is later refined when the skier becomes more efficient at powder skiing.
- The pole swing and plant assists in the rhythm and timing of this extension and flexion movement.

Middle

- The legs continue to extend developing even greater edge angles and contact with the snow.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- At the point of maximum extension the legs and upper body are tall, ready to absorb the next mogul.

Initiation

- The rapid up motion in the cross-over brings the skis to the surface. The extension should occur with a closer stance where the skis are weighted more evenly.
- The pole plant takes place at the extent of the up motion.
- Now that the skis are closer to the surface and easier to turn, the legs start to twist them towards the fall line.

MECHANICS NEEDED FOR POWDER SKIING

Previous experience

All guests of any level should get the chance to experience skiing in powder.

Terrain ● ■ ◆

For beginner to intermediate skiers, 10cm of new snow on green and blue and black runs is a good way to experience powder skiing. For advanced skiers, 15 – 20cm of fresh, light snow on blue runs are the ideal conditions for learning powder skiing.

Bouncing in a traverse can help develop a feeling of porpoising through the snow

Why

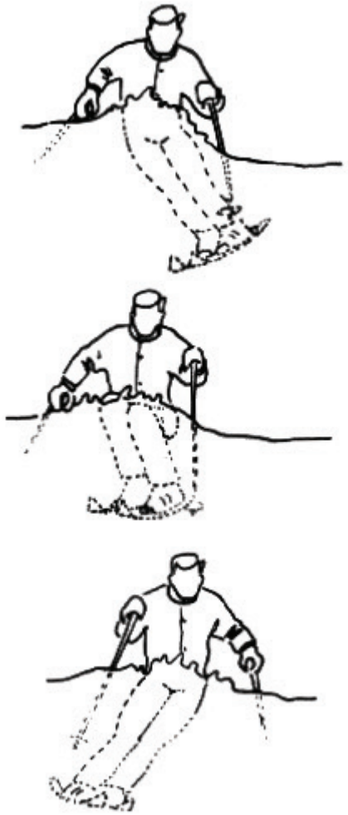
Bottomless powder skiing may be the most enjoyable of all the skiing sensations. There is nothing like the weightless, smooth, peaceful feeling of flowing through the powder, away from the crowds and the lifts.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Stance closer together.
- Spread out body weight over both feet during the turn.
- New sensation of getting the ski to float.
- Aggressive extension/flexion. This is refined to a retraction/extension movement once the speed is increased and the dynamic nature of the turn warrants it.
- Strong leg turning.
- Subtle change to turn shape that needs to travel down the hill.

Method for teaching powder skiing

- Start with a safety discussion on appropriate places to ski, falling, loss of skis and finding them etc.
- Warm up getting used to skiing with a more even weight distribution and a closer stance.
- Straight run or traverse (depending on the steepness of the terrain) through the powder bouncing up and down to get a feel of the snow consistency.
- Try shallow linked turns with ONE bounce per turn. The turn shape should flow from arc to arc down the hill.
- Try varying the radius, emphasising strong leg turning and minimal upper body movement so as to not disrupt balance.
- Once comfortable with the speed, advanced skiers use similar movements to a retraction/extension to replace bouncing. It is less tiring but a straight run with a few bounces will often be needed to get started.



KEY POINTS WHEN TEACHING POWDER

- Certain movements make it easier to ski powder:
  - More up and down movement (to begin with) to help unweight and turn the skis.
  - A stronger turning force from the legs to overcome the resistance of the powder.
  - Closer stance to provide a platform with the skis with more even weighting to float on the new snow easier.
- Some adjustment of balance to the heel of the foot may be needed to help the front of the ski float in heavy conditions.
- Avalanches are not common in Australia but they do occur. Before venturing into steeper off-piste areas, consult with ski patrol to check on the conditions.
- Explain to the students how to get up and look for lost skis.
- Always ski with a partner.
- Always adhere to trail and boundary signs.
- Specialised, wider powder skis greatly enhance the learning experience in deeper powder.
- A retraction/extension movement can only be used once the skier is moving and has enough speed to create a platform from which to first absorb. This is why many skiers start a run by straight running and making a few rhythmical bounces.

COMMON POWDER SKIING PROBLEMS AND THEIR SOLUTIONS

	Common problem	What you see	What you teach	Exercises and consolidation
BEGINNER	Sitting back	Student is sitting back trying to get the tips up on the surface of the snow.	Explain the concept of getting the ski to float or porpoise to aid turning without leaning back.	– Bouncing across or in the fall-line (terrain dependent) – Use easier terrain, flatter or less deep snow – Can shuffle or pedal across the hill to feel one leg at a time
	Stance too wide	Daylight between the legs. This may open and close through the turn/ traverse.	Keeping the skis/ boots closer together. Constant leg tension by squeezing the feet and knees together.	– Bouncing in a close stance. – Exaggerating a close stance on the groomed runs – Analogies such as holding a tennis ball between the boots without dropping it – Holding a glove between the feet
INTERMEDIATE	One ski sinks (tips diverge)	Skier does the splits and often falls forward as one ski tip hooks up. Can be inside or outside ski.	Even weight distribution.	– 50/50 weight on boot feet – Bounce through both feet like a kangaroo – Bouncing on the spot and in a traverse to porpoise both skis
	Leaning in	Skier leans into the turn and puts too much weight on the inside ski. The outside ski runs straight and they end up diverging.	Roll ankles and knees into the turn. Keep the upper body upright and stable.	– Groomed run angulation exercises before going into the powder. Storks, swords, edge rolls, etc. – Easy terrain and shallower turns – Hop with both feet through turn initiation – Jump turns – Aggressive flexion/extension
ADVANCED	Speed control	The skier's turns are very straight. Their stance usually widens and balance is lost. May result in falling.	Build confidence in turning. Emphasize the stronger turning effort. Use easier terrain at first.	– Single bouncing J-turn as back-up plan – Bouncing garlands – Funnel bounce turns – Stem Christies can aid turn initiation & build confidence – Use powder skis
	Falling forward	Front sault over the tips of the skis. Skier looks floppy in trunk.	Heel pressure and strong core.	– Bounce down through the heels – Lift toes up inside ski boots
	Finishing turns too much	The skier will find it hard to start each turn as they will be going too slowly and the skis will sink.	A turn shape that skis more arc to arc down the fall line. Releasing the turn sooner.	– Bouncing in a straight line on easy terrain working into shallow turns. – Powder 8's with a partner/instructor
	Popping too much	The skier continues to pop up and down to free their skis from the powder. The skier will look energetic and jerky.	Refine to retraction/ extension turns.	– Ret/Ext turns on the groomed – Pulling the knees to the chest at the completion of each turn – Ski powder with small, old bumps underneath

WRITE YOUR OWN PROGRESSION FOR TEACHING POWDER SKIING

(Use the above method and relevant exercises/analogies and tactics)

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CRUD SKIING

CRUD IS A TERM THAT DESCRIBES POWDER SNOW THAT HAS BEEN TRANSFORMED BY SKIERS AND/OR WEATHER CONDITIONS TO ONE OF THE FOLLOWING: CHOPPED UP POWDER/ WIND PACKED SNOW/BREAKABLE CRUST/HEAVY, ROTTEN SPRING SNOW/RAIN AFFECTED SNOW.

Previous experience

Your students should already have experience with off piste skiing and carved short/medium turns on the groomed runs.

Terrain ■ ◆

Blue terrain is the best choice as too flat a terrain will make the skier go too slow. Slowly move to steeper terrain and the cruddy conditions as the student improves their skill set.

Why

- **It provides variety and a challenge to advanced skiers.**
- **Like advanced moguls it is a true indication of your expert level of skiing.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **Stance closer together.**
- **Even body weight over both feet during the turn (depending on depth).**
- **Aggressive extension/flexion. This is refined to a retraction/extension movement once the speed is increased and the dynamic nature of the turn warrants it.**
- **Strong leg turning.**

MECHANICS OF SKIING IN THE CRUD

To ski successfully in the crud, as it is a constantly changing medium, a vast repertoire of all previously learnt turns will be of use. A good feeling for pressure control combined with an aggressive attitude will be of greatest benefit.

Method for teaching crud skiing

- Warm up skiing some medium turns with your feet close together exaggerating the stance needed to ski in the crud.
- Jump turns on a groomed blue run, jumped initiation with a steered finish (soft Speiss).
- Move to some cruddy conditions and do single turns as above, focussing on the aggressive extension/ flexion needed to get out of the crud.
- Link jump turns in the crud.
- If the conditions allow it, reduce the jumping and turn more in the snow with a retraction/ extension movement.

KEY POINTS WHEN TEACHING CRUD

- As it is a constantly changing medium, a vast repertoire of movements will make it easier to initiate the turn. From bounces, stems, retraction/ extension to jump turns.
- The amount of up motion depends on the skill of the skier and the difficulty of the conditions. The more difficult the conditions the more the skis are jumped out of the snow and turned in the air.
- The true expert uses a technique that combines jumping with a retraction/extension movement.
- If the skis are not edged, the inconsistency of the chopped-up powder bounces skis around that are relatively flat and throws you off balance. The skis need to slice through the crud.
- As it can be quite easy to fall and even injure oneself in the crud, always consider the guests' standard when assessing the following:
  - Depth
  - Consistency
  - Steepness.

COMMON PROBLEMS

See previous turns and match up to what the guest is doing.

WRITE YOUR OWN PROGRESSION FOR TEACHING CRUD SKIING

(Use the above method and relevant exercises/analogies and tactics)

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SWITCH SKIING

SKIING BACKWARDS IN CONTROL

Previous experience

Students must be able to make at least steered parallel turns (forward) before attempting the manoeuvers in this section.

Terrain

Green runs to start off with transitioning to blue groomed runs once they consolidate their skills.

Why

Switch needs to be something that you want to learn, it can be thrilling and very useful for entering and exiting jumps.

MECHANICS OF SWITCH SKIING

The skier makes parallel turns but the stance needs to be adjusted to suit riding 'switch' (backwards). The calves will be pressed more firmly into the boot although the basis is still a centred position. It is important that guests can ski while looking over their downhill shoulder to see where they are riding and for safety reasons.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety when skiing backwards
- Centred position with calf pressure
- Shoulder rotation to allow the head to twist over downhill shoulder

Method for switch skiing

- Warm up with some steered medium turns.
- Stationary - show a balanced stance for riding switch (more calf pressure).
- Backwards snowplough 'J' turn to a stop, do both sides.
- Backwards parallel J-turns to a stop on both sides.
- Traverse backwards looking over downhill shoulder (for safety).
- Backwards traverses linked with snowplough turns.
- Linked backwards traverses with sweeping parallel turns (poles can be used for assistance with instructor going forward).
- Shorter linked turns, backwards, with head always looking over downhill shoulder (to aid rhythm).
- Aim to work the skis into parallel from the bottom up, like a basic Christie, until they are in constant parallel.
- Parallel short turns, backwards is a good goal to work towards for jumps like:
  - 180 over roll-over
  - 360 over roll-over (both need good rotation so use head and shoulders to aid rotation and to spot landing).

KEY POINTS WHEN TEACHING SWITCH

- **All guests should have twin tip skis as a safety precaution to ski switch.**
- **It is best to teach these progressions in an open area away from obstacles and traffic. Make sure they have warmed-up well before starting to ski switch.**
- **Freeride should be taught in a relaxed atmosphere to allow the culture of free expression to grow.**


Switch snowplough turns

COMMON SWITCH SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Not looking over downhill/outside shoulder	Not looking over the correct shoulder or looking straight back up the hill (not safe as it produces a blind spot).	Explain the need for looking where you ski. Work on turning the head & shoulders to see.	– Practice single turns each side – Practice in slower switch snowplough turns – Use a staggered stance (exaggerated tip lead) to allow the body to face more downhill – Hold poles & use teacher assistance to move the skier's body
Breaking at the waist	Bent over at the waist with stiff legs, not much ski control.	Even flex & balance over the foot.	– Move to flatter terrain – Increase shin pressure through bending ankle & knee – Stand taller at the waist
Too much shin pressure (leaning uphill)	Skier will look stiff and be heavy on the tongues of their boots.	Even flex with calf pressure to allow CoM to keep up with the skis.	– Explain that the calves are needing to touch to boot to stay balanced when skiing backwards -Move to flatter terrain and work on calf pressure

WRITE YOUR OWN PROGRESSION FOR TEACHING SWITCH SKIING

(Use the above method and relevant exercises/analogies and tactics)

INTERMEDIATE RAIL/BOX SLIDES

SLIDING A MAN-MADE FEATURE SIDEWAYS SUCH AS A BOX OR RAIL WITH THE SKIS PERPENDICULAR TO THE FEATURE.

Previous experience

All guests should be able to do parallel turns, side slip and have previously skied straight over a box.

Terrain feature

A short box that is close to the ground and without a gap from take-off to feature is ideal. A plastic sheet on the snow can also be used as an introductory step to sliding sideways.

Why

- **Boxes and rails are further features to test a skier's skill.**
- **They are also a good option for advanced skiers in times of low snow and limited terrain.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **ATML**
- **T=Popping onto the box sideways**
- **M=Sliding sideways, and**
- **Low, wide balance position**

MECHANICS OF INTERMEDIATE BOX SLIDES

Side slipping should be referenced as it is used extensively in rail sliding. Intermediate box slides include popping on and off a box with a 90° rotation to allow the skis to side slip across the box. Sliding should be done in a low balanced position (Centre of Mass over the feet) with the box (rail or snow) under the middle of the feet, with the skis flat. Hands in a wide position and eyes focused on the end of the slide to aid balance.

Method for intermediate box slides

- Introduce the student to the fun box or plastic rail showing the take-off, sliding surface and landing area.
- Warm up allowing the guest to pop on and pop off a fun box in a straight run.
- Try sliding the box (or grounded plastic) in boots to feel the sideways slipping motion. Practice in a low/wide stance.
- Ski over fun box straight running, twist the skis at the end of the box (try pivoting with a flat ski) and straighten again for the landing.
- Or, if on a dug-in plastic rail, ski in at a 45 degree angle. As they ski over the rail, they need to flatten their skis, lean downhill and slide the rail in a square position.
- Ski in a flexed position, rise and rotate 90 degrees until side slipping, then slide or pop off the end.
- Practice both sides.
- Get student to pop on and pop off box with balanced sideslip.

KEY POINTS WHEN TEACHING BOX SLIDES

- Leaning slightly down slope, looking at the run-out can help with balance.
- Take the guest to lots of natural terrain features like ridges, humps and bumps to get used to sliding with tip and tail in the air and the snow being directly under their feet.
- Start on a wide box, plastic sheet on the snow or two pieces of plastic conduit set in the snow. Only take a guest to a metal rail who has had lots of experience.
- Care must always be taken when choosing correct terrain as features such as rails/boxes are built in different sizes and taking your guest to one that is too large or narrow is the same as taking a beginner to a black run.
- Constantly maintain these features (especially the take-offs) if they are on the ground so your guests do not trip over on protruding pieces of plastic.
- Snow conditions such as ice and powder can make some terrain features difficult.
- Always observe the terrain park etiquette.
- Other suggested safety equipment includes helmets, mouthguards and body armour.
- A good warm-up is a necessity before doing any freeride skiing to help limit the chances of injury.

COMMON RAIL AND BOX PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Slipping onto their hip	Skier can get onto the rail/box at 90' but slips straight onto their hip. Shoulders are often angled uphill.	Manoeouver Teach skis flat and the sensation of slipping sideways. Even weight, wide stance (gorilla stance) with shoulders at same slope as the box.	– Use a box with less downward slope. – Practice side slips on natural features. – Point at the end of the rail to aid balance on downhill ski. – Exaggerate the balance on the downhill ski, try lifting uphill ski.
Falling off the rail (forwards or backwards)	Skier has enough speed but tips off the rail either forwards or backwards.	Manoeouver Teach to balance the feet over the rail when sliding.	– Teacher assistance. – Use Freestyle max. – Dye on natural features.
Falling off the middle of the rail while slowing down	Skier slows down and slides off the rail.	Approach Need to maintain speed while sliding.	– Start higher on the run-in. – Use plastic pipe to practice on (it can be slower but it's good to try going faster in a safe environment). – Focus on the end of the rail & the run out.

WRITE YOUR OWN PROGRESSION FOR TEACHING INTERMEDIATE BOX/RAIL/SLIDES

(Use the above method and relevant exercises/analogies and tactics)

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HALF PIPE

SKIING DOWN A MAN-MADE FEATURE IN THE SHAPE OF HALF A DRAIN PIPE AND USING THE WALLS TO GAIN AIR.

Previous experience

Parallel skiers can enjoy riding up and down the transition of a pipe but carving is a prerequisite for exiting a pipe.

Terrain

All introductory manoeuvres are taught on green to easy blue terrain and do not need to include terrain parks as there are plenty of natural terrain features on the mountain to promote learning, before heading into the man-made pipe.

Why

Pipe riding is one of the most exciting man-made features available in ski resorts and when uncrowded it is accessible by many levels of skiers.

MECHANICS NEEDED FOR RIDING HALF PIPE

The halfpipe is an exciting terrain feature to experience. As most pipes are quite large you will get a better result by working on your guest's carving skills out of the pipe first on natural wind lips etc. as strong pipe riding takes a good understanding of carving and the skill blending needed to achieve this.

Mechanically the skier uses:

- **Strong edging skills to both grip the pipe and control direction throughout.**
- **Dynamic stance through all three joints to keep the body perpendicular to the angle of the slope.**
- **Jumping technique (static, pop or absorption) to deal with the shape of the coping (over-vert or under-vert) when exiting.**
- **Full body rotation to control direction in the air.**
- **Confidence and commitment.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Edge control
- Leverage to maintain the body at 90° of the surface
- Pressure control to deal with changes in terrain
- Body rotation to re-direct travel when in flight

Terminology

Platform, shoulder or deck: the flat part at the top of either side of the walls (where you walk up).

Coping: the edge at the top of the walls.

Flat bottom: the floor of the pipe, in-between the walls.

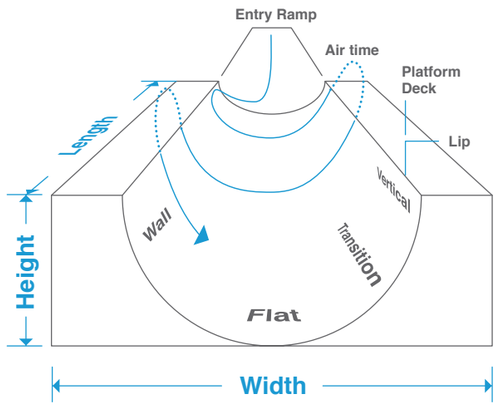
Transition: the curved bottom part of the walls.

Vertical: the top part of the walls.

METHOD FOR SKIING HALF PIPE

Out of the pipe:

- Warm up skiing medium carve turns in a corridor about the size of a half pipe.
- Using natural wind lips or gullies, ski up the walls and twist to head back down: Focus on using upper body rotation to head back down the slope. This is done by combining an edge release with a turn of the head and shoulders back down the slope.
- Try with a small pop to get the skis off the snow and mimic the sensations.



In the pipe:

- Introduce them to the pipe, the terminology and etiquette involved in riding pipe.
- Show them the line to enter the pipe.
- Ski turns from transition to transition in a zigzag shape using the above rotation with a slight pop if in the transition.
- Gain confidence and speed and head higher up the wall using good edge grip to stop falling back down. Reduce the pop if on the 'vert'.
- Once they can reach the top of the wall, try a drop in from the shoulder (deck), then ski the pipe.
- When able to get above the coping try exiting the pipe and landing on the deck.
- Now the student can ski the pipe, but this time instead of heading up onto the deck they keep their legs stiff and strong (as in intermediate jumps with no absorption or pop needed) to allow them to exit the pipe into the air, rotating back in and landing on the transition.
- Work on reading the shape of the wall to determine if a pop (under vert.), stiff leg (vertical) or absorption (over vert.) is needed.

KEY POINTS WHEN TEACHING HALF PIPE

- You must consult with your snowsports school to find out the policy for jumping and taking groups into terrain parks such as waivers, ability levels, etc.
- Good jumping technique prior to riding pipe is preferable.
- Helmets are strongly advised.

COMMON PIPE RIDING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Fear	Not being able to either reach the coping or exit the pipe.	Work on edge control up the transition & into the vert. Not just increased edge but an ability to release as well. Lots of pipe time to gain confidence with the feature.	– Carving up natural features – Make sure they can pop & revert off small natural walls – Side slip down the pipe's-wall at the top of each turn to get used to travelling down the pipe with flat skis
Compressing through the transition.	Skier either collapses at the waist or buckles in the legs through the transition. Can cause them to straighten their legs & pop out on take-off.	Teach the skier to hold their core strength through the transition & to stay 90° to the running surface.	– Keep muscles tense/strong – Look at the coping on the way up – Use freestyle max to show 90'
Landing on the flat bottom	Skier pops from the coping on take-off, moves away from the wall & lands down on the flat bottom.	Teach to read the cut of the wall; over-vert (absorb) under-vert (pop) & try to get them to jump down the pipe not away from it.	– Use freestyle max, do not pop if not necessary – Side slip down the pipe's-wall at the top of each turn to get used to travelling down the pipe
Speed control	Skier travels down the length of the pipe either too fast or too slowly.	Carving skills for the pipe but explain that the angle you cross the pipe will determine speed (and number of hits) while the angle up the wall will determine the height of air.	– Practice holding & controlling speed with carving on natural features – Build a mini pipe & use freestyle max to explain angles of attack
Not perpendicular	Can be caused by fear. The skier leans their body too far forward when climbing the wall.	Staying 90° to the pipe surface at all locations in the pipe.	– Feeling of leaning back when going up the wall – Drawing in the snow or freestyle max to demonstrate perpendicular position – Single ins and outs from the coping

WRITE YOUR OWN PROGRESSION FOR TEACHING HALF PIPE

(Use the above method and relevant exercises/analogies and tactics)

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5.6A COMMON ADVANCED EXERCISES

STANCE - ADVANCED

- Hopping – tips, tails, whole ski, during turning.
- Long skate and glides
- Active projection (through an imaginary doorway) into new turn
- One ski, no poles
- One ski through the bumps
- Boot skiing
- Short turns – poles held horizontal behind knees
- Hopping through the transition/traverse of a long turn

Squeeze the glove

Getting the stance closer together for situational skiing like powder, crud and moguls.

- Try on easier groomed run at 1st.
- Place your glove between the student's ski boots and ask them to squeeze their feet together and hold your glove.
- Try some turns holding the glove all the way through. A constant muscle effort will be needed to hold the glove there without dropping it.
- Remove the glove and try to ski with the same squeezing sensation.
- Try the sensation in your desired situational skiing task.

Boots undone

Helps to find balance over the whole foot and a stance that doesn't rely on the front of the ski boot for support.

- Undo the power strap and loosen the rest of the buckles. It is safer to leave the buckles latched in the ladder as opposed to fully undoing them.
- Encourage feet and toes staying relaxed – feeling the whole foot (avoid clawing/clenching with the toes).
- Ski some turns feeling the above.

Double pole plant

Moving forward through the transition of pure carved turns

- Swing both poles through the transition.
- The touch is not imperative but the student should focus on how the swing moves the body forward during the cross-over

ROTARY - ADVANCED

- As many turns as possible – feet apart, feet together
- Draw two fall-lines 3m apart, turn tips from one to another
- One ski skiing
- Backwards Wedeln
- Give them dry land exercises such as yoga to help improve flexibility.

Basic javelin turns

Leg turning, hip position and separation.

- Start in a snowplough position, lift the tip of the inside ski after the fall line continue to turn the outside ski's tip under it via leg rotation.
- The more the skis cross, the more separation the skier developed.
- Practice this leg turning sensation and any desired parallel turns.

Javelin hockey stops

Leg turning, upper/lower body separation in short turns.

- Face down the fall line in a bullfighter position.
- Once some momentum is gained, lift the inside ski and hold it facing down the hill as you turn the outside ski underneath.
- The more the skis cross, the more separation the skier has developed.
- Practice this leg turning sensation in short turns.

Maximum short turn challenge

Leg turning and upper/lower body separation. Also a good exercise for foot speed and agility.

- Challenge the student to do as many short turns between 2 points.
- The emphasis is on speed and the amount of turns not the performance.
- You can turn this into a competition within your classes to see who can do the most.

Hard Speiss

Leg turning or separation drill, pressure control exercise and to develop athletic quick movements.

- Stationary practice hopping in the air. Focus on flexing and extending all 3 joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first to make it easier for a novice at Speiss turns.
- Move to an easy slope so the skis don't slide too much and try linking a couple of turns each way.
- Add in a solid pole plant to help with stability and timing.
- Try on steeper slopes that will require a greater range of twisting.
- Can be done on one ski.

Poles on hips (the cage)

An awareness exercise for hip discipline and leg turning.

- Connect the pole loops to the opposite handle so that the poles stay on the pelvis as you ski. The student can gain an awareness if the poles and therefore the hips are rotating and or tipping into the turn.

EDGING - ADVANCED

- Tug-of-war
- Speiss on edges
- Noodle legs (edge rolls where the knees are pointed out then in again making the skis leave an hourglass rail road track)
- Repeated edge sets through a long turn
- Javelin turns (inside ski is lifted and tip placed over the outside turning ski for hip position)
- 1000 step turns for inclination
- One legged garlands

Pivot slips (Braquage)

Good for edge control and rotary. Check students can sideslip confidently prior to this exercise.

- Sideslips in both directions focused on flattening both skis at the same time.
- Add a pivot of both skis after the flattening phase. Explain that you want to pivot the skis from the centre of your ski boots. Imagine there is a metal pin coming out from under the middle of each ski boot and that this is locked into a rail in the snow that only allows you to turn from this central point. Like a helicopter's rotor blades.
- Work on upper body discipline after the student gets a feel for the correct pivot point.

* Be aware of snow conditions as heavy slushy snow makes this very difficult.

Sliding natural features

Fun progression after pivot slips or side slips using terrain to help.

- Look for natural convex features or terrain that could be like a natural box or rail to slide. Mini ridges of snow on the edge of runs are perfect.
- Ski onto the high point of the snow feature and pivot both skis sideways. Aim to keep the middle of both feet on the highest point.
- Attempt to slide/grind the feature as far as possible.
- Challenge to change directions more than once on the same feature.
- * Be smart about snow conditions.*

Power wedelns (carved)

Strong edge grip in dynamic short turns.

- Re-explain a snowplough wedeln and practice.
- Show the student how to roll and hold the ski onto a high edge angle. Press hard onto the arch of foot (point out some gritting of the teeth is needed).
- Use a strong leg to power the skis around to get the short turn.

Edge rolls

Develop edging movements from the ankles and knees. Can be used into dynamic short turns to promote early edging.

- Stationary on flat terrain roll ankles and knees from one side to the other (use poles for support).
- On easy green terrain link narrow edge rolls down the fall line with the same movement.
- Try to isolate the edging movement by trying to do this in a railed performance.

Cowboy turns

Early edging for short turns.

- Practice short turns with a very wide stance.
- Gain a feeling for twisting the ski while it's on the edge.
- Narrow the stance back to a neutral width and try to replicate the same feeling of guiding the skis on their edges.

Schlopy turns

Progressive edging and angulation in pure carved medium/long turns.

- Try some pure carved medium turns with no poles, hands up and in front of the body.
- Progressively lower outside hand to touch the outside boot.
- Start the movement just after the initiation and continue the movement to turn completion.
- Once the hand touches the boot, transition into the new turn.

Crab walk

Stronger edging through ankle and knee angulation. A good drill for feeling the sensation of railing.

- On easy terrain start in a snowplough position facing down the fall line.
- From a flexed stance roll the ankles and knees as much as you can to tilt 1 ski over on its edge.
- Practice this in motion, aiming to lock the outside ski on its edge, change direction slightly and then switch to the other leg.
- Connect this new edging sensation into the desired turn.

Skating

Early edging, ankle and knee angulation and cross-over.

- Skating on flat terrain trying to feel rolling from the little toe side of the foot to the big toe side.
- Skating in the fall line on easy green terrain focusing on the above.
- The early edge feeling can be built into carved short turns by adding the rotary or crossing over in dynamic medium turns.

Heisman drill

Rotational alignment in pure carved medium/long turns. This will help develop stronger hip angulation.

- Outside hand on hip, inside hand pushes forward.
- Direct the inside hand downhill to develop more counter if needed for the angulation.
- Switch hands in the transition.

White pass turns

Cross-over in pure carved medium/long turns. Early edging and inclination.

- Crossing-over with weight on the inside ski.
- Lift outside ski through the transition/initiation, this causes the upper body to have to cross the skis.
- Drop outside ski and transfer weight back to outside ski from middle to turn completion.

Pure carve snowplough with in-rigger

Hip position. Encourages progressive edging and lateral movement throughout a pure carved turn.

- At lower speeds use a wider snowplough.
- Lock the outside ski onto its edge with ankles and knees first.
- Shorten the inside leg to allow the hips to move in.

Hip to the snow

Hip angulation, hip position and encourages progressive edging and lateral movement throughout a pure carved turn.

- Stationary practice of moving the hip laterally and down towards the snow. Use partner assist or ski pole for balance. Explain that the hips move on an arc toward the snow not just on a straight line laterally.
- Get down on snow in static skiing position with inside hip/buttock on snow showing longer outside leg and shorter inside leg. This would be maximum possible edge position. Point out the need for a small amount of separation/counter to achieve this.
- Static: if the snow is soft try toppling over with the focus of the inside buttock cheek landing on the snow first as opposed to the knee. You can also use a soft snow bank.
- Try moving hip close to the snow in a fast J-turn keeping balance on outside ski.
- Link dynamic turns focusing on points inside the new turn that you move your hip towards.

PRESSURE CONTROL - ADVANCED

- Aeroplane turns in moguls
- Retraction/extension turns (see progressions)
- Start the turn on ball of foot and finish on heel (leverage, working entire ski)
- Pre-jump bumps (absorb before hitting the bump in anticipation of its size)
- Try to get maximum pressure at end, middle or start of turn
- Jump turns landing softly (soft Speiss)
- Push and pull feet (fore and aft) while turning (Austin Powers turns)
- Slow turns through the moguls to exaggerate the bend and stretch movements (slow dog noodle).
- Turn slowly, then quickly, through moguls
- Turn on inside ski to fall-line, then change to outside ski

Using a spine for extension retraction turns/absorption

The spine can help with feeling the timing of when to retract in the transition and when to extend the legs to the side. It's a great tool to practice the feeling of absorption outside of the moguls.

- Draw a $ in the snow and explain how to ski over the spine using it as the straight line through the $ sign.
- Ski the spine keeping the CoM at the same height off the snow.
- Actively retract the legs when the spine starts to push up against the feet and actively extend the legs when you feel light pressure once the feet have gone over the spine.
- Ski different turn sizes and speeds over the spine to develop versatility.

High speed moguls traverse

Absorption, pressure control, touch and balance for off piste skiing.

- Have the student ski fast across a bump field.
- Work on soaking up the impact with legs while the upper-body stays stable.
- Try to keep ski/snow contact.

Hold your absorption (for timing)

- Work on holding your absorbed position until the backside of the bump falls away from you. If you extend too early snow, contact will be lost.
- External cue: imagine a glass ceiling above your head that you don't want to breakthrough. Extend at the same rate as the terrain falls away from you.
- Best to demonstrate this exercise from side on. Analysis from side on too.

Jump turns

Pressure control movements in powder and crud to make the initiation easier.

- Stationary practice hopping in the air. Focus on flexing and extending all 3 joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first to make it easier.
- Try some medium carved turns with this hop at the initiation.
- Add in a solid pole plant to help with stability and timing.
- Try in the powder/crud to get the skis on top of the snow at the initiation. Making it easier to twist them.
- Practice a stronger leg turning action to power the skis through the deep snow after the initiation (i.e. when the skier lands).

Dolphin turns

Pressure control, practice the feeling of fore aft movement of the feet for moguls.

- Find some well-spaced, medium sized bumps most likely found in the afternoon on a chopped up groomer or a spine on the side of a run.
- Show how to pop off the bump into the air then bring the tips down by pulling the feet back on the backside of the bump.
- Practice on individual bumps.
- Intro the concept of pushing the feet forward up the face of the bump as you pop so your feet are slightly in front of your CoM on take-off.
- Try dolphins with the same movement without leaving the snow.
- In the bumps use the pedalling backward analogy to help with absorption and extension.

Drunken sailor

Pressure control in dynamic turns. Develop a greater range of extension and retraction for situational skiing.

- Try making railed/pure carved turns on an easy slope focusing on keeping the centre of mass at the same height off the snow.

Single Sailor, on easy terrain, start in a low flexed position facing down the fall line.

- Extend one leg to the outside while keeping the CoM and head low. Allow the ski to be placed on its edge (slight snowplough shape) and rail back to the body.
- As the ski comes back to the body flex/retract the leg so the body is undisturbed.
- Repeat this several times on one leg to get the feeling of extending the leg, feeling the pressure build and retracting it to the body to control it.
- Repeat above on both legs.

Drunken Sailor, alternate the above sensations from leg to leg in the fall line.

- Work this movement back into dynamic parallel turns feeling the range of extension/retraction as felt in the drunken sailor.
- A reverse funnel starting with low edge rolls can be useful for this.

OTHER EXERCISES

Figure 8's (powder 8 synchronised skiing)

Corridor skiing

Helps to create a grid for skiers to quantify the outcomes of the turns. Helps them understand the path the skis should take and how the skier should be deflected from side to side in a short turn

- Holding your poles in the swords position ski straight down the fall line and Draw 2 lines in the snow. This should leave 2 lines in the middle where your skis have been and 2 outside lines where your poles have left a mark.
- Get the students to ski down doing short turns guiding the skis outside the outer lines from one side to the other while facing down the hill with their upper body.
- If there is too little early edge or if the twist is not progressive the skis will not be directed to the outside of the lines before the fall line.
- Work on grip then twist to encourage a better path and earlier edge.
- Although the skiers upper body is facing down the hill the centre of mass should still be going side to side over the centre lines.

5.6 ADVANCED/EXPERT

CARVED SHORT TURNS

SIMILAR TO STEERED SHORT TURNS BUT WITH MORE SPEED, POWER, AND EARLIER, STRONGER EDGING.

Previous experience

The student will need to able to make solid basic short turns with no obvious skill deficiencies and have an understanding of carving.

Terrain ● ■ ◆

Green terrain is again used to learn how to edge earlier and more strongly. This is then consolidated on blue and later groomed black runs.

Why

- To develop a more powerful, dynamic and exciting image.
- To be able to make short turns on steeper terrain, narrow trails, firmer snow conditions, moguls and variable snow conditions.
- Short turns that tap into the side cut of the ski utilising its design.

MECHANICS OF CARVED SHORT TURNS

Initiation

- The ski's edges grip the snow strongly on a higher edge due to an active ankle/knee roll and the cross over.
- They are then guided from the legs to complement the use of ski design for shaping the turn.

Transition

- From a flexed position, the skier makes a pole swing.
- The skier crosses over their skis to engage a higher edge angle.

Completion

- A flexing of all joints is used to help with carving the outside ski to completion.
- The turn is finished in a countered/ anticipated position, ready to start the next turn.

- Controlled absorption is needed to handle the increase in pressures of the dynamic turn.

Middle

- The upper body is held by the core muscles to remain stationary and facing down the fall line.
- From this strong position the legs are continually tipped onto the edges and guided by a powerful twisting effort under the stationary upper body and pelvis.
- The blending of these movements creates a good basic position that is inclined and angulated more than its steered counterpart (BP).

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Early edging.
- Strong progressive edging throughout.
- Powerful leg turning against a strong/stable upper body and core.
- Controlled absorption.

METHOD FOR TEACHING CARVED SHORT TURNS

Method 1: Snowplough wedeln

Good for upper/lower body discipline or fixing weak rotary

- Warm up with a funnel or doing short turns.
- Snowplough wedeln with stronger edge grip on green terrain by rolling foot/knee.
- Add stronger leg turning to wedeln.
- Wide track parallel short turns on easy blue terrain maintaining the same carving from above exercise (edging followed by twisting is a good cue to think of, even though the ultimate goal is to have them blended).
- Try short turns with more speed and on steeper terrain.
- Strive for as little pivoting as possible and a round turn shape. Emphasise edging first followed by twisting the legs.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Method 2: Skating

Good for increased edge angle but needs good upper and lower body separation

- Warm up with a funnel or doing short turns.
- Skating on the flat, feeling the rolling from little toe (or a flat ski) to big toe to gain edge.
- Skating in the fall line on easy green terrain focusing on the same as above.
- Same as above but funnel in by guiding the skis on the edge with strong leg turning between skates.
- Work into parallel short turns with the same rolling action striving for as little pivoting as possible and a round turn shape.
- Emphasise edging first followed by turning.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Method 3: Edge roll

Good for increasing edge angle

- Warm up with a funnel or doing short turns.
- Short rhythmical edge rolls on green terrain rolling both feet/ knees to gain early edge.
- Crossover with the hips making a more active movement, so that the edging does not come from the feet/ knees only.
- Blend the need for strong leg turn into the edge roll to guide the skis on a high edge.
- Slowly increase the pitch to easy blue terrain to produce more speed, more bending of the ski and hence more deflection. Aid this with the help of a subtle pressure regulation from tip to tail.
- Explain and practice the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving carved mechanics, exploring terrain and reciprocal teaching tasks etc.

Note: this can also be used for slalom style short turns (pure carved).

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KEY POINTS WHEN TEACHING CARVED SHORT TURNS

- The edging should happen as early as possible by rolling the feet and knees in the direction of the turn.
- It is hard to combine the earlier edging with speed control so choose your terrain wisely.
- Keep an eye on student energy and fitness levels.
- Other factors that determine how early the edging takes place in dynamic short turns include:
  - Equipment (side cut)
  - Steepness (too steep= late)
  - Radius (too tight= late)
  - Speed (on flat terrain)
- When teaching guests to carve the skis a substantial increase in edging and angulation is required. Our goal is to let the skis' design help with the direction of the skis, but not to completely take over and have the ski's rail. This greater edging will make the skis tougher to twist to completion and the students need to be aware that they are in for some physical work.
- Powerful short turns produce a substantial build-up of pressure in the turns. A retraction/extension movement is imperative to absorb the rebound and avoid being thrown around. This is where the Centre of Mass remains a similar height above the snow and the skis are carved from arc to arc under the body.

- Due to the increased speed and earlier edging, the skis will travel farther away from the body, requiring stronger hip angulation. The feeling will be one of a loopier turn. Sometimes telling your students to remain patient will help develop the right skill blend between stronger edging and less twisting/rotary (in comparison to the basic short turn).
- A cross-over movement is needed in short turns. A funnel is a good way of introducing carved skiers to the short turn cross-over.

WRITE YOUR OWN PROGRESSION FOR TEACHING CARVED SHORT TURNS

(Use 1 of the above methods and relevant exercises/analogies and tactics)

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COMMON CARVED SHORT TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Heel pushing 	The front of the skis stay close to the fall-line while the tails slide out from side to side, like a car windscreen wiper. This can often result in the student being in the back seat.	Earlier edging. Teach an awareness of the correct pivot point that occurs as a result of early edging.	– Snowplough wedeln – Cowboy turns with edge – Carve the tip of the ski – Edge rolls
Down stemming 	The tail of the outside ski breaks away (downhill) through the turn completion. Usually caused by the stance being too far forward or by hip rotation.	Adjust the stance to stay centered. In particular, focus on the angle of the ankle joint, if too much shin pressure is causing the forward stance (i.e. not relying on the front of the boot). Leg turning/pelvis awareness and position.	– Undone boot turns – Feeling more evenly front and back of the boot (neutral cuff) – Check equipment (i.e. footbeds, forward lean etc.) – Use thigh muscles to stand off the boot in lift lines – Leg turning exercises – Upper body/hip stability exercises – Press shins at a 45' angle rather than forward
Upper body or hip rotation 	Body or hips turn first & faster than the legs/skis. Slower cadence (tempo) to the turns. Weaker edge grip with skis washing out or down-stemming.	Teach leg turning but on an edge for carving. Use exercises that focus on the new movement & also eliminate the old pattern.	– Stationary leg turning exercises. Boot arcs, lift and twist, bow ties etc. – Pole exercises to lock out hips or upper body – Hands on hips – The cage for hip
Upper body tipping	Skier looks over inclined or has no angulation. The shoulders move over the skis directly towards the centre of the turn at initiation.	Angulation & rolling of the ankles/knees first to initiate.	– Swords – Poles held vertically or horizontally to help sense body movement – Pairs feedback – Edge rolls with ankles/knees
Leg action not strong enough	Legs look jello under an unstable upper body	Increase leg speed and intensity.	– Very short, short turns – Shadow/syncro the instructor – Speiss – Fast wedeln – Maximum short turn challenge
Turn shape too elongated	Legs seem to stay under the body & often speed increases.	Round out the turn shape with an efficient X-over of the body.	– Clock face analogy – Follow instructor – X-over with the hips – Use brushes with a race corridor – Corridor skiing drawn in the snow – Syncro skiing

PURE CARVED MEDIUM AND LONG TURNS

A FAST TURN THAT IS PURELY CARVED, WHERE THE SKIS ARE LOCKED ON THE EDGES ALL THE WAY AROUND THE TURN, CUTTING A NARROW, CLEAN GROOVE IN THE SNOW.

Previous experience

Students will need to be able to make controlled medium carved turns on blue/black terrain first. They also need a desire to make higher speed turns than what they already do.

Terrain

The railing exercises that lead into pure carving need to be learnt on green terrain. Due to the fast nature of this turn. Pick an area with little traffic. Only when the students are comfortable railing on the easier green terrain should you move onto blue runs.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Locking the skis on edge (i.e. railing).
- Develop into pure carving by working the ski's design.
- Active cross-over.

Method for teaching the pure carved medium turn

- Warm up with some medium carved turns, challenge the student to ski with maximum edge.
- Stationary - explain the concept of railing and locking the ski on edge. Practice getting the right amount of edge angle for a rail from a wide stance. You can roll the outside leg only to show how to both incline and angulate. Discuss ski design and patience to allow the railing effect to work.
- Single turn, starting across the hill (45°) or a full J-turn, work on railing (repeat to both sides).
- Link on easy terrain (staying near the fall line, if students are comfortable with railing start edging both skis).
- Stationary - introduce and work on an active crossover.
- Practice linking rails again, edging both skis and actively crossing over to get early edge pressure.
- Introduce the idea of varying the radius by increasing the edge angle through the turn.
- Link turns on slightly steeper terrain (easy blue) and try to tighten the radius.
- Emphasise the need of both a well-angulated hip position, strength in the outside leg and inclination to get enough edge.

Why

- To experience the exhilarating sensation of a pure carved turn.
- To be able to ski faster, in control.
- To be able to ski faster through a racecourse.

MECHANICS OF A PURE CARVED MEDIUM TURN

Initiation

- The edges of the skis are locked into the snow via the active cross-over movement.
- The skier's centre of mass can move further to the inside than a carved turn due to the increased speed and edge grip they are balancing against.
- An extension of the body lengthens the joints particularly of the outside leg, allowing the skier to weight the newly engaged outside ski well before the fall line.
- Depending on the speed being travelled, some inclination of the whole body is productive during this phase of the turn to achieve the above mechanics.

Middle

- Progressively increasing the edge by creating more angulation, especially at the hip. This occurs best by holding the upper body and core strong, allowing some counter to develop as the inside half moves forward. Bending at the waist as the legs tip in will create the angles.
- A change in the independent leg length is required. Lengthening the outside leg resists the centrifugal force while shortening the inside leg allows the hips to move into the turn and keep the weight balanced on the outside ski.
- The blending of these movements creates an inclined and angulated basic position (BP).

Completion

- Edge angles are continually increased to work the skis to the desired turn shape.
- The outside leg remains long until such time that absorption of pressure is required. The bending of the ski's design throughout this turn will require a substantial retraction of the legs to absorb and control the developed pressure.

Transition

- The skier is in a lower position as a result of absorbing the skis' energy when exiting the previous turn and in an effort to actively cross-over.
- The body/ Centre of Mass actively crosses-over the skis, moving directionally forwards and across so that the skier can catch up to their feet. This movement of the body will result in a powerful high and early edge angle.
- Balance on the new outside ski is established.
- A pole swing is often used here to help with the active cross-over movement.

KEY POINTS WHEN TEACHING PURE CARVED MEDIUM TURNS

- The first goal is to rail from one turn to the next without applying a twisting or guiding force to the skis. Next the student should try to tighten the radius of the turn by getting the skis to bend.
- Teach your students to stand up to flatten the skis if they need to get off the edge to avoid something as a safety precaution.
- There is a strong active cross-over movement in these turns and the feeling of falling into the turn, as you cross-over, is both a scary and exhilarating one.
- Do lots of exercises to encourage moving into the centre of the turn e.g. rubbing inside hand on the snow and banking exercises.

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- The aim is to teach guests to vary and tighten the radius of the railed turn by:
  - Achieving even more edge angle at the start of the turn, with early pressure on the outside ski, by using an active cross-over movement.
  - Increasing the edge angle through the turn by inclining the whole angulated position (progressive edging). The greater the edge angle the tighter the arc the ski makes.
  - Actively resisting the centrifugal force by keeping the outside leg strong. This strength is gained through muscle resistance and hip angulation.
- Rhythmical, flowing movements both through the turn and from one turn to the next. Remind the guests of the importance of a pole touch to aid this. The faster the rhythm, the tighter the turn radius will be.
- Pressuring the front of the ski at the start of the turn through the use of leverage and body direction in the cross-over (more applicable for high level instructors and racers). All of the above points constitute working the ski, as opposed to remaining static on the skis.

COMMON PURE CARVED MEDIUM TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Weak edging 	Skier is having trouble pure carving and the skis either carve or skid.	Check for a correct stance. Use the railing sensation and exercises to develop an awareness of when the student is "locked on edge".	– Stationary - show edge grip with a snowplough or herringbone position, explain the feeling of pressure under the foot. – Railing on gentle terrain. – Increase the amount of inclination of the angulated position. – Try a ski with a narrower waist or increased side cut.
Radius too long (railing - ski are not being worked) 	Very large turn shape, static ski position & not much pressure build up. Often called park & ride.	Tightening the radius by getting the ski to bend. •Progressive edging •Strong outside leg •High, early edge •Moving forward •Rhythm	– Stationary tug-of-war. – J turns with progressive edge. – Stronger more directional X-over. – White pass exercise. – Use a tight rhythmical race courses. – Scholpy turns. – Pure carved snowplough, In-rigger turns.
Falling in at the start of the turn 	Loss of balance at the start of the turn can result in either a white pass or falling.	Controlled/slower turn transition. Use angulation in the crossover.	– Work on controlling pressure build up from previous turn. – X-over slightly more forward, not directly downhill (move with the skis). – Doorway x-over with angulation. – Swords.
Squaring up	The skier's upper body and shoulders will face directly where the skis are going. Not much hip angulation will be formed.	Develop counter through the turn at the hips. Passive leg turning and upper body discipline.	– Heisman drill. – 1 pole swords. – White pass (stopping early counter). – Strong core. – Vision downhill. – Gentle edge rolls with hands on hips.

WRITE YOUR OWN PROGRESSION FOR TEACHING PURE CARVED MEDIUM TURNS

(Use the above method and relevant exercises/analogies and tactics)

SITUATIONAL PROGRESSIONS

MOGULS- SKIING A LINE

A 'LINE' IS A WELL-DEFINED GROOVE DOWN THE FALL LINE BETWEEN A SERIES OF REGULARLY SPACED MOGULS.

Previous experience

Guests need to be willing to ski a mogul field, have the ability to make controlled short turns (preferably carved) and have experience skiing on the top of spaced moguls.

Terrain

Green to blue terrain with regularly spaced moguls is best to start with. Use short sections of a line with a clear run out.

Why

- **Skiing in the line allows you to control your speed by using short turns in the fall-line.**
- **It's the starting point to advanced moguls and once you are used to staying in a line with control you can then learn to ski faster and use absorption to maintain balance.**

MECHANICS OF SKIING A LINE IN MOGULS

Using a well-shaped, regularly spaced line; the guest makes steered or carved short turns around each mogul. The shape of each mogul will determine the need for either an offensive round turn or a more defensive hockey stop turn. A pole plant is placed towards the top of the mogul to aid rhythm and stability to the upper body.
A slight rising to re-centre through the transition is still used as the speed travelled should be kept down due to controlled turns, therefore, the need for absorption is not yet required.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Short turns around the moguls, skiing in the troughs.
- Blocking pole plant.
- Speed control in varied terrain.

Method for introducing a line in the moguls

- Warm up doing short turns.
- Explanation of making short turns in the 'line' or troughs. Find an easy line and show (or draw with a pole) the exact line.
- Short turns in this easy line (6 turns) focusing on quick turns and speed control. Pick a line that is well-spaced and easy to control the speed (preferably with a run-out).
- Hockey stops around some easy bumps for control. Add in blocking pole plant to finish for stability.
- Practice controlled short turns in slightly more difficult lines with more turns.

KEY POINTS WHEN TEACHING A LINE

- The line may be explained as the path water would follow if poured down a mogul slope.
- Use short turns, you ski around the moguls by staying in the troughs.
- Watch that the students do not get too tired making short turns in moguls.
- Hockey stops can be a very useful warm-up for controlled mogul skiing in a line.
- It is useful to work on short turn technique outside of the moguls (e.g. for a warm up) and then work on mogul skiing technique/ tactics once in the bumpy terrain.
- Passive absorption may be involved to help maintain balance as the student becomes comfortable.

COMMON LINE PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Cannot hold a line 	Skier can only link a few turns before losing the line.	Check the student has the skill to make short turns in the fall line on a groomed run. Show where the line is.	– Walk the skier around the line. – Find short easy lines with 5-6 moguls & a run-out. – Use dye to show the line. – Analogies such as "water travels around the moguls". – Use freestyle max to explain the line.
Sliding down the sides of moguls	Skis are flat and sideslipping. Skier initiates on top (like intro to moguls) and slides down the side into the trough.	Rounder turn shape the skis are kept away from the moguls. Increase edging to hold the line.	– Steer around the bumps. – Tips lead, tails follow. – Follow instructor. – Single turns to a stop (edge control).
No speed control 	Skier either becomes faster & faster or pulls out of the line after a few turns.	Speed control in the moguls.	– Find smaller moguls/easier terrain. – Hockey stops on the back of moguls. – Steer or carve a rounder line. – 2 turns per bump. – Clock face analogy. – Early pivot and skid down the back. – Follow the instructor.
Skis are too far apart 	A large gap between the legs. Legs are different lengths, one leg on top of mogul with other down in the trough. Balance will be thrown around laterally.	Teach a narrow stance.	–Traverse with narrow stance. –On groomed ski holding a glove between the knees. –Stork turns on groomed with lifted ski held near other knee.
Pole plant	Incorrect timing of pole or placement. Skier may hold onto the pole plant too long causing upper body rotation.	Remind students when and where to pole plant i.e. slightly on down hillside of mogul if possible.	– Single turns or short line to show where to pole. – Punch pole after planting to move forward.

MOGULS-ABSORPTION

ADVANCED MOGUL SKIING INVOLVES MAKING FASTER SHORT TURNS IN THE FALL LINE OF A MOGUL RUN WITH GOOD ABSORPTION.

Previous experience

Guests need to be able to make strong, rhythmical short turns in control on blue/black runs. They also need to have some experience skiing short fall line sections of moguls at slower speeds i.e. intermediate moguls.

Terrain ■ ◆

Best taught on blue terrain with round, well-spaced 'lines' and softer snow. Steeper runs, tighter lines and larger moguls can be tried out as the skill level improves.

Why

- It's one of the most challenging and difficult aspects of skiing. Being able to ski moguls well is a true indication of your expert level of skiing.
- The skills required to maintain balance in moguls are also used to ski other challenging, off piste terrain, like powder and crud.
- Skiing the fall line at speed requires an active retraction/ extension movement to remain in control.

MECHANICS OF ADVANCED MOGUL SKIING

Initiation

- Just after the skier retracts to absorb the bump there will be a light point from where the bump drops away. The legs must extend to regain snow contact and start to develop some edge grip and balance on the outside ski.
- During the extension, the ski tips dive in order for the skis to follow the contours of the snow.

Middle

- The legs continue to full extension developing even greater edge angles and contact with the snow.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- At the point of maximum extension the legs and upper body are tall, ready to absorb the next mogul.

Completion

- The feet are pushed ahead slightly just before impacting the next mogul.
- Both legs relax and start flexing to control the build-up of pressure delivered by the next bump.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around.
- At the point of maximum absorption the hips are lower than the knees and the thighs almost hit the chest.

Transition

- When the legs flex to absorb the pressure built up from impacting with the bump, the body moves across the skis.
- A blocking pole plant on the top/ downhill side of the bump stabilises the upper body.
- As the body crosses the skis and enters the new turn, the legs will begin to extend into the trough.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Absorption over the bumps
- Extension into the troughs
- Dynamic balance and/or leverage to keep ski tips following the contours of the terrain

Method for teaching advanced mogul skiing

- Warm-up with fast short turns on the groomed and then check the group can ski linked turns in a moderate line (intermediate moguls).
- Explain the stance needed for absorption as the speed increases and/or the bumps get bigger. Ski upright in the hip and flexed at the ankle.
- Stationary - lean on the poles, move one leg up and down to get a feeling for the movement of absorption.
- Traverse through bumps (ideally bigger bumps that are spaced) focusing on the correct absorption technique, can be done with speed.
- Work independently on the flexion stage or extension phase on single bumps.
- Attempt an easy line with short turns and absorption.
- At first keep ski to snow contact by pulling the feet back under the CoM when absorbing.
- Practice versatility.

KEY POINTS WHEN TEACHING ADVANCED MOGUL SKIING

- Avoid big moguls if they are icy.
- Make sure you confirm the student's standard to choose the appropriate terrain.
- Making short turns in a line is easier to learn than making short turns in a line with absorption. Absorption is introduced when the students are comfortable skiing faster in the line.
- The feet are pushed ahead slightly just before impacting the next mogul and, as the skier passes over the mogul, the upper body is moved forward to avoid being left behind (somewhat like pedaling a bicycle backwards).
- You will need to spend time practicing the absorption separately before combining it again with short turns in a line.
- As bumps become larger and more distinct, it becomes more difficult to dictate your own path through the moguls. The moguls start to dictate where you turn i.e. through the troughs.

Dolphin turn

Ski-to-snow contact

COMMON ADVANCED MOGUL SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Not enough Absorbing 	Student is jolted, rises or loses control when hitting a bump. The skis may leave the ground after the bump. Skier's legs stay the same length throughout the turn.	Range of movement (retraction/extension with the legs). Where and when to do this in the bumps.	– Stationary extension/retraction for range. – Extension/retraction turns. – 1 Bump Extension. – 1 Bump Retraction. – Traverse in the bumps with absorption. – Drunken Sailor exercise.
Not enough extension	Skier shows active absorption but still has a loss of ski to snow contact while moving into the trough. They may either stay low or get lower as they ski down the run.	Get the student to open the ankle and push the ski tips into the trough. Work on active extension to maintain ski to snow contact.	– Traverse in the bumps focusing on extension and ski to snow contact. – See-saw or toe-tipping explanations. – Dolphin turns.
Absorption from upper body, not the legs. 	Upper body collapsing at the waist as the skier hits a bump. Skier's legs stay the same length through the turn.	Range of movement/ absorption with legs while the body stays strong. Mogul's stance (flexed ankles and knees, more upright at the hips). Strong core and upper body stability.	– Traverse with quiet upper body (analogy: like pedaling a bike backwards). – Extension/retraction turns. – Practice in smaller bumps. – Jump turns or Speiss on groomed. – Short turns with core activation. – Stationary mogul's stance. – Partner push and pull with hands to feel timing for absorption. – Jump into a bump with feet in front (open hip), back upright, absorb with legs.
No Speed control	Skier gaining speed down the hill.	A certain amount of absorption will slow the speed of the CoM down the fall-line.	– Where to approach or hit the bump in the turn transition. – Dryland: jumping downstairs to slow the descent each absorb. – Backwards bicycle pedaling. – Practice versatility change lines, turn shape & size.

WRITE YOUR OWN PROGRESSION FOR TEACHING ADVANCED MOGULS

(Use the above method and relevant exercises/analogies and tactics)

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SKIING ICY CONDITIONS

Icy conditions are not uncommon in Australian resorts. Warmer temperatures during the day followed by below freezing temperatures at night, can produce hard conditions in the morning. Skiing these icy conditions can actually be a good challenge, so long as the following tactics and safety considerations are heeded.

Tactics and safety considerations

- The most important factor is to maintain sharp edges. If your edges are sharp you can make good quality turns on the hard surface. If they are not, you are forced to make skidded turns with less control over your direction.
- Never take your skis off if you lose your confidence on the run. Instead, side slipping down the run will have much more control.
- Choose easier terrain.
- On ice it can be more difficult to change direction or pull up quickly. Keep the speed down to avoid collisions with other skiers or objects, especially when skiing down towards the group. As always, have the students stop below the group.
- Avoid skiing icy areas with rock outcrops or trees, although sometimes the snow in the off-piste areas can be less icy.
- Incorrect stance problems are accentuated on the hard surface. Too far forward and the back of the ski will wash out. Too far back and it will be difficult to finish the turns and control the speed.
- If you do fall on an icy run, try to keep the skis below you so that you can dig the edges in to slow down.

The technique or method for skiing ice is the same as for softer snow but with more emphasis on:

- Keeping the skis wider apart as it's better for balance and edging ability.
- Keeping all the body weight on the outside ski so that it penetrates the hard surface and grips more easily.
- Look ahead for patches of soft snow or search on the sides of trails where it tends to land from other skier's spray.
- For longer turns, be smooth and soft on your edges as abrupt movements tend to send you sliding.

Notes

RETRACTION/EXTENSION TURNS

TURNS MADE WHERE THE UPPER BODY STAYS AT THE SAME HEIGHT ABOVE THE SNOW WHILE THE LEGS RETRACT AND THEN EXTEND AWAY FROM THE BODY.

Previous experience

It is desirable if the student has had experience making carved medium radius turns on a blue/black run or mogul skiers looking to gain more speed and balance in the fall line.

Terrain

Best taught on blue terrain. Utilise bumps, knolls and spines to help learn the timing and feel of the movements.

Why

- **The retraction/extension movement is used in advanced bump skiing to absorb the bumps.**
- **It is also required in dynamic long and short turns to assist with pressure control that is built up from the dynamics of the turn.**
- **If skiing fast through the powder and crud, this movement is also used to help maintain balance and to increase turning power.**

Initiation

- After the skier retracts to absorb the previous turn's pressure, there can be a light point just like absorbing a virtual bump. Therefore, the legs must extend to regain snow contact and start to develop some edge grip and balance on the outside ski.
- The CoM continues to move to the inside of the turn.

Completion

- Edge angles are continually increased to work the skis to the desired turn shape.
- Both legs relax and start flexing to control the build-up of pressure.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around. This will keep the CoM relatively low.

Transition

- The Centre of Mass (CoM) stays low during the cross-over. When the legs flex to absorb the pressure built up from the previous turn, the body moves across the skis without extending straight up.
- As the body crosses the skis and enters the new turn, the legs will begin to extend to the other side.
- The pole swing happens through the absorption phase and will be planted while the skier is quite low.

Middle

- The legs continue to full extension, developing even greater edge angles and build up of pressure.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- The blending of these movements creates an inclined and angulated basic position (BP).

MECHANICS OF A RETRACTION/EXTENSION TURN

The aim of this turn is to practice the movements required to control pressure changes in medium radius carved turns. The object is therefore, not to allow the Centre of Mass to move but rather stay at the same height above the snow.

Using spines and bumps is the easiest way to practise the timing of the retraction/ extension movements.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Retracting through the completion.
- Extension of the legs and body after the initiation into the middle of the turn.
- Timing of these movements in situational skiing (i.e. moguls, pure carving, powder etc.).

Method for teaching retraction/extension turns

- Let the group warm up trying to have a go (keep CoM low and at the same height).
- Explain the R/E turn and the needed timing.
- Work on the retraction phase, during the edge change.
- Work on the extension in the middle of the turn.
- Try individual full turns combining the retraction and extension movements (e.g. upside down question mark turn).
- Try linked R/E, maybe crude to begin with, work on timing.
- Consolidate by working on ski performance and timing of the skills.

KEY POINTS WHEN TEACHING RETRACTION/ EXTENSION

- The retraction/extension movement is one of the most difficult yet crucial skills for advanced skiing. Without it, dynamic mogul skiing is out of the question, powder skiing is not as balanced and smooth, and dynamic short turns on the groomed are difficult to control.
- You must choose the appropriate ski performance for your guest's intended goals or outcomes. Teach a pure carving method for those wishing to control pressure while racing OR teach a carved method for those wishing to ski better in the moguls or off piste.
- Practicing on groomed terrain is a good way to show an understanding of pressure control.

Bumps aid the retraction.

A pole can be used to practice staying low through the transition

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COMMON RETRACTION/EXTENSION TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Rising centre of mass 	Upper body rises through the transition into the turn initiation.	Transition and edge change from a low position.	– Use the ceiling analogy – Ski under the instructor's pole – Swords (holding poles half-way) – Low traverse/side slip garlands – Edge rolls in low position – Practice on small knolls or spine
Timing incorrect	Retracting or extending too quickly or at the wrong place in the turn.	Explain why the student has to retract/extend and where this has to happen in the turn.	– Draw the movements in the snow – Use a spine to timing – Drunken sailor to help feel the pressure – Low position edge rolls into a reverse funnel – Try doing it more slowly/smoothly – Count out the movement
Not enough range of motion	Skier looks as though they are just skiing in a low position and the legs do not lengthen.	Teach the crude movements first to show how much is needed then work on timing.	– Traverse with quiet upper body (analogy: like pedaling a bike backwards) – Extension/retraction turns – Practice in smaller bumps – Jump turns or Speiss on groomed – Short turns with core activation – Stationary mogul's stance – Partner push and pull with hands to feel timing for absorption – Jump into a bump with feet in front (open hip) back-up right, absorb with legs

WRITE YOUR OWN PROGRESSION FOR TEACHING EXTENSION/RETRACTION TURNS

(Use the above method and relevant exercises/analogies and tactics)

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ADVANCED RACING

INCLUDES ORGANISED RACE EVENTS SUCH AS INTERSCHOOLS, MASTERS AND ANY TRAINING WHERE IMPROVING PERFORMANCE BECOMES IMPORTANT.

Previous experience

Students should already have race experience and be able to do a carved parallel turn at a minimum.

Terrain ■

Best terrain is an easy blue 'NASTAR' style course or set a GS type course on a run that is roped off from the general public.

Why

- **Racing is a fun pastime but once the student starts to treat racing as a sport then performance becomes important.**
- **It does not necessarily relate to winning but can simply come down to improving personal performance.**
- **Ski racing can also improve carving and general skiing under a different environment.**

MECHANICAL SKILLS NEEDED FOR ADVANCED RACING

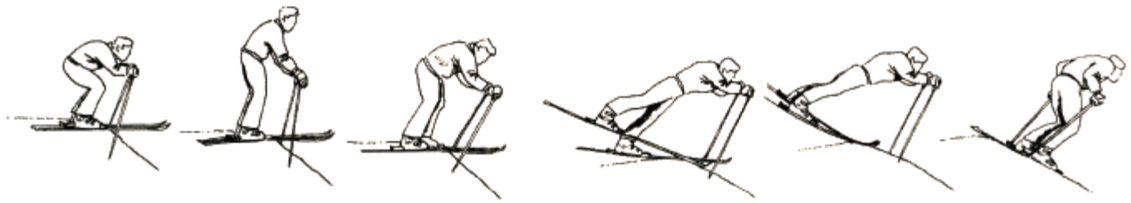
- **Mechanically a pure carved turn is fastest, but some pivoting technique at the top of the turn may be needed to set a good line.**
- **How to do a fast start.**
- **Skating may be needed.**
- **An understanding of a fast 'line' both a high line for more time in the fall-line and a tight line for aggression.**
- **Tactics for finishing the race and improving performance.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **Improved starts**
- **Improved finish**
- **Improving the line with the goal of increasing speed**
- **Improving performance with the goal of increasing speed**

Method for teaching advanced racing

- **Safety should be the first priority.**
- **Warm up with either dynamic medium turns or medium carved turns, depending on your guest's ability. Use exercises to target skill deficiencies.**
- **Inspect the course and re-explain the concept of line.**
- **Use markers (stubbies or cones) at this point to practise a fast early line.**
- **Work on starts and the finish.**
- **Add timing and work on performance in the course.**
- **Remove students from the course at any time to correct movements in their performance skiing. Then try integrating this faster technique back into the course and line previously worked on.**

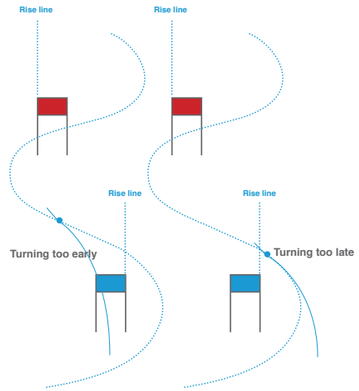


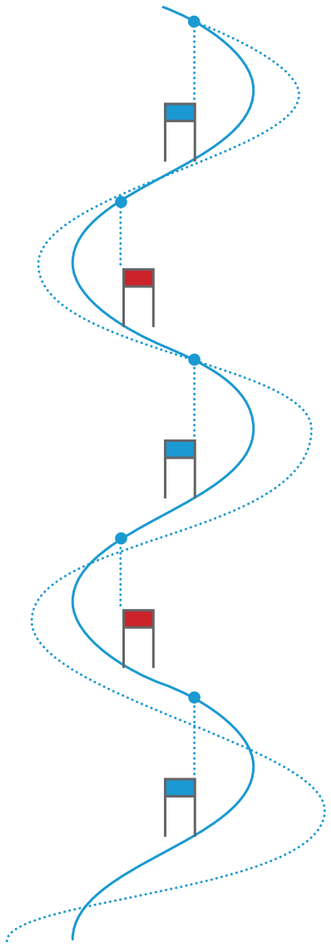
Key points when teaching advanced racing

- Improving performance for racing is all about improving speed or time. This is achieved both through an improved line and ski technique, in and out of the course.
- Better to challenge with exercises than terrain.
- Students should know what to do in the event of a fall (get out of the way etc.)
- You need to help keep the course in good condition by working as a slipper THAT INCLUDES YOU!
- Side-slipping provides a good chance to explain various lines.
- Advise the student to wear a helmet.
- Never run a course while it is being set up.
- Be aware of mechanised vehicles on and near the course.
- When using screw-in gates make sure they are screwed in below the snow surface. If the base is above the snow, a fall onto the gate could cause an injury.
- Make sure the turning side of the flag/panel is not tied on. This is so that if you catch your arm on the gate then the panel will come off.
- The entire course including the finish area must be roped off from the public.
- There should only ever be one racer on course at a time.
- Monitor your student's fitness and energy levels, training should include a warm-up and cool down. In some instances the sport specific training may only include 2-3 full race runs.

COMMON ADVANCED RACING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Racer is having trouble holding the line	Slides off the line ending up too low to make the next turn or even skis out of the course.	Check equipment and set. Work on stronger edging through the turn. Reduce the ski performance to exaggerate the line then gradually build back up.	– Have skis tuned. – Work on pure carving out of the course. – Set a rounder course. – Set brushes showing where to X-over & engage edges (rise line).
Trouble staying on the right line	Skier aims at the next gate and rushes the turn. Skidding will occur and perpetuate the problem.	Re-explain the 'rise line'	– Use dye to mark the rise line or aiming point. – Use brushes for helper gates with the line. – Follow the instructor .
Railing the course	Skier does not get the ski to bend enough & starts to run straighter & faster (loses control or line). Has trouble setting the line at the top of the turn.	Work on pure carving (working the ski) in the course, may need to set the correct steering angle before working the ski.	– Take racer out of the course to work on turn shape. – Use markers to round line-out & pure carve back at the gates. – Practice setting a steering angle out of the course & implement later in with markers. – Ski a brush course first with pure carving.
Fear of the gates	The skier may be on an early exaggerated line but it is too wide/far away from the gates.	Bringing the line closer in to the gates by building confidence. This will increase the overall speed and reduce the skier's overall time.	– Ski brushes and stubbies first. – Angle gates away from the skier (to the inside of the turn). – You can build a mixture of the above sets to help bring in the line and reduce fear of the gates.





Tactics are important in racing and despite the standard of the instructor or your guest, learning the line through a race course and how to use the rise line can be very advantageous for a fast time.

What is the Rise line?

The rise line is an imaginary line that rises up the fall line from the flag. It is a rough indicator for the racer to start his/her turn. Racers talk about being "patient" across the hill until they reach the rise line to initiate their turn.

Starting the turn before the rise line may send the skier directly at the gate resulting in a low line below the gate.

Equally, turning too late, after the rise line will send the racer too far away from the gate.

Variable terrain can change the line you take through a course, for example, on steep terrain starting the turn high on the rise line is needed while on the flat, taking the turns straighter and lower on the rise line. There are times when a sharp/tight change in direction is needed and it is necessary to start the turn after crossing the rise line in order to complete the turn at the gate. This tactic is known to racers and coaches as a "come from behind" manoeuvre. To practice how the rise line can work for you, spray a paint line above the gate and try to turn on that line while racing the course.

WRITE YOUR OWN PROGRESSION FOR TEACHING ADVANCED RACING

(Use the above method and relevant exercises/analogies and tactics)

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PURE CARVED SHORT TURNS

SHORT RADIUS TURNS THAT ARE PURELY CARVED. THE SKIS ARE LOCKED ON THE EDGE ALL THE WAY AROUND THE TURN, CUTTING A NARROW, CLEAN GROOVE IN THE SNOW WITH ZERO SKIDDING.

Previous experience

Students need to be able to make controlled short carved turns on blue/black terrain first. Understanding a pure carved medium turn and the premise of locking the skis on edge. They also must have a desire to make higher speed short turns.

Terrain

The railing exercises that lead into pure carving need to be learned on green terrain. Pick an area with little traffic to do the railing exercises. Only when the students are comfortable railing on the green terrain can you move on to blue terrain.

Why

- To experience the exhilarating sensation of pure carved short turns.
- To be able to ski fast and in control on groomed terrain.
- To be able to ski faster through a slalom racecourse.

Method for teaching pure carved short turns

(Edge roll method)

- Warm up with a funnel or doing short turns.
- Fast, rhythmical, pure carved edge rolls on green terrain rolling both feet/knees.
- Cross-over with the hips making a more active movement, so that the edging does not come from the feet/knees only.
- Slowly increase the pitch to easy blue terrain to produce more speed, more bending of the ski and hence more deflection. Aid this with the help of a subtle pressure regulation from tip to tail.
- Explain and practise the use of passive absorption to deal with the increase in pressure.
- Consolidate by improving pure carved mechanics and working the ski.

Initiation

- The skier's legs extend from the flexed position through the transition. The legs must extend (in particular the outside ski) to regain snow contact and start the development of edge grip and balance on the outside ski.
- The Retraction/Extension movement sets the body up for higher edge angles and increased inclination through both the initiation and into the middle of the next turn.

Transition

- A pure carved short turn has a rapid build-up of pressure from the dynamic combination of speed, high edge angles and a substantially shorter radius.
- The Centre of Mass stays relatively low during the cross-over when the legs are flexing to absorb the pressure built up from the previous turn. As this flexing of the legs occurs, the upper body actively crosses over the skis directly towards the centre of the next turn.
- The pole swing happens through the absorption phase and will be planted while the skier is quite low. The plant can either aid in stability of the body at the end of a dynamic turn or at the start, to assist with body direction into the new turn.

Middle

- The legs continue to extend developing even greater edge angles and build up of pressure.
- Discipline is maintained with the upper body facing the shoulders and chest down the fall line.
- A progressive increase in edging continues through a blend of knee and hip angulation.
  The speed and rhythm in which this takes place is significantly faster to tighten the radius.
- The blending of these movements creates an inclined and angulated basic position (BP).

Completion

- Both legs relax and start flexing to control the rapid build-up of pressure.
- The upper body and core needs to stay disciplined and strong so that the legs flex up to the body and not the other way around.
- The upper body continues to stay facing down the fall line while the legs are pure carved towards the initiation of the next turn.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Active cross-over movement.
- Faster implementation of progressive edging.
- Retraction/extension movements for absorption of pressure.

MECHANICS OF PURE CARVED SHORT TURNS

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KEY POINTS WHEN TEACHING PURE CARVED SHORT TURNS

- Slalom style skis with a tighter radius will make this turn more achievable.
- Teach your students to stand up and flatten the skis if they need to get off the edge to avoid something.
- The skis should be kept wider apart to help aid balance as a result of the higher speeds.
- Retraction will often be needed to deal with the increase in pressures of the turn.

COMMON PURE CARVED SHORT TURN PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Weak edging	Skier is having trouble pure carving and the skis either skid or carve.	Check for a correct stance (slightly lower). Make sure the student is aware of the railing sensation & the concept or zero skidding.	– Railing on gentle terrain – Increase the amount of inclination of the angulated position – Try a ski with increased side cut – Edge roll exercises on easier terrain – Reverse funnel on easy terrain
Turn shape too elongated	Legs seem to stay under the body and the speed often increases. Looks more like a rail than a pure carve.	Round out the turn shape with a more active X-over so the skier can move further into the turn. Progressive edging and rhythm.	– X-over with the hips – Use brushes with a race corridor – Try a ski with increased side cut – Release the turns sooner to keep a quick constant rhythm
Unable to control pressure form the turn 	Skier either gets shot into the air or does an unwanted white pass. Balance will be lost and often the turn radius will increase.	Pressure control through the end of the turn allowing the skis to cross under the body without disrupting balance.	– Use drunken sailor to understand pressure build-up – Work on controlling pressure build up from previous turn – X-over slightly more forward, not directly downhill – Ext/Ret short turns – Dolphin turns
CoM left behind	The skier's body gets left behind as the skis travel faster down the hill. They are unable to effectively move across the hill, speed control is often lost.	Moving forward/down the hill in the transition. Earlier tip pressure & working through the middle of the turn.	– X-over exercises – Allow skis to travel under CoM through end of turn – Dolphin turns – Use leverage to get the tip to engage

WRITE YOUR OWN PROGRESSION FOR TEACHING PURE CARVED SHORT TURNS

(Use the above method and relevant exercises/analogies and tactics)

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STEEP SKIING

GENUINE STEEP SKIING IS ON TERRAIN THAT HAS 40 DEGREES OF STEEPNESS OR MORE.

Previous experience

Best taught to guests who can do dynamic short turns with control on black runs and have a desire to ski steep terrain.

Terrain ■ ◆

The technique for skiing steep terrain has to be learned on easier terrain first. Blue terrain is ideal to start with, followed by groomed black runs and then shorter, steep pitches with a good run-out.

Why

- The challenge of skiing steeper terrain is a thrill and an adrenalin rush.
- Skiing a steep chute could be compared to the rush of bungee jumping.
- Advanced skiers may need to use it to get down a small section of an 'off-piste' slope.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety in the steeps
- Speed control
- Faster Initiation with up motion using varying amounts of initial steering angle
- Strong completion with a solid edge set
- Reaching pole plant downhill from feet

MECHANICS NEEDED FOR STEEP SKIING

The movements on steeps are the same as short and medium turns. However, the skier now has to use a more defined up motion to make the turn initiation easier and quicker so they don't build up too much speed.

For speed control the skis are guided by the legs across the hill, enough to slow down. Strong edging during the completion of the turn using the ankles and knees grips the skier to the steep slope, while the upper body angulates over the downhill ski for balance. The skier should reach for their pole plant downhill from their boots to hold this angulation and aid commitment to the next turn.

METHODS FOR TEACHING STEEP SKIING

Method 1: Hockey stop

Speed control technique used on steep black runs.

- Review hockey stops on moderate terrain. Stress the need to turn the skis right across the hill with a good edge set and a solid pole plant.
- Short turns with a strong up motion, later edging, strong finishing and pole plant.
- As the students become more comfortable with the terrain, reduce the amount of up motion.

Method 2: Soft Speiss

If steeper black runs are available that require turning in the air.

- Try jump turns on blue terrain (soft Speiss small turn in air steered or carved finish).
- Try these turns on a short steep slope with an easy out-run.
- Traverse between the turns to start with, then link the jump turns continuously.

Method 3: Hard Speiss

Used for extreme steepness

- Stationary - practice hopping in the air. Focus on flexing and extending all three joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first, to make it easier for a novice at Speiss turns.
- Move to an easy slope so the skis don't slide too much and try linking a couple of turns each way.
- Add in a solid pole plant to help with stability and timing.
- Try on steeper slopes that will require a greater range of twisting.

KEY POINTS WHEN TEACHING STEEP SKIING

- Shorter radius turns with a strong up motion are the most appropriate mechanics, a solid pole plant and a later but strong edge set to finish the turns, will control the speed.
- Initially avoid steep terrain with obstacles and avoid steep terrain if the conditions are too icy.
- Always assess fall zones in the steeps and avoid areas where skiers could fall and potentially slide into a hazard.
- Teaching self-arresting is imperative before heading into steep dangerous terrain where someone could fall and slide a long way.
- Jump turns are very tiring; keep an eye on the fitness level of your students.
- The amount of up motion depends on the steepness of the terrain and the skill level of skier.
- When the terrain becomes extreme in steepness the skis are jumped off the snow, turned in the air completely across the fall line and edged strongly on landing. The skis are literally jumped from one edge set to the next.
- An expert skier combines the jumping with a retraction/extension movement. As the skis are jumped off the snow, the legs retract quickly, turn in the air, extend to regain snow contact and absorb the landing.
- You need a strong pole plant that is planted further down the hill to help commit to the next turn. It helps project the body down the hill when you jump, provides support and assists with the unweighting.
- Placing the pole further down the hill helps to give the skier a more angulated position thus giving them better pressure control by balancing over the downhill ski.

COMMON STEEP SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Fear	Leaning back or into the hill. Large traverses and balking at the initiation.	Take to easier terrain & work up to steeper to build confidence. Stemming to help start the turns.	– Stem Christies up-hill for initiation. – Lift the skis tail slightly when jumping (careful not to catch tip-use appropriate terrain). – Do edge set jumps down the slope. – Garland hops. – Reaching pole plant down hill.
Weak edging	Skidding at the end of the turn, loss of turn shape and balance in bumpy terrain.	Strong angulation and edge set.	– Hockey stops on steep terrain with strong edge set & pole for balance. – Do edge set hops down the slope. – Speiss turns landing on the edges (hard Speiss). – Edge set garlands. – Side slip edge sets. – Reaching pole plant down hill.
No speed control	Skier gets faster & faster & may end up in the back seat.	Turn shape to control speed on easier terrain and work up to steeper terrain. Quicker initiation to get the skis around faster.	– Clock face analogy. – Hockey stops. – Short single J-turns or ?-turns. – 180° Speiss. – Re-visit jump turns.
Poor pressure control	Skier lands with stiff legs, breaks at the waist, becomes unbalanced or wobbly.	Focus on proper absorption or softening the legs during landing.	– Hockey stops on flatter terrain building up to the steeps. – Speiss landing soft. – Retraction of the legs after the initial jump. – Edge set jumps down the slope landing soft. – Jump turns focusing on pulling the skis up off the ground after the initial jump.
Upper body rotation	Upper body swings around during the jump.	Leg turning and strong separation.	– Vision focus exercises. – Leg turning exercises on the groomed. – Strong pole plant for stability. – Pole plant placement to block u/b rotation. – Don't hold onto the pole plant too long .

WRITE YOUR OWN PROGRESSION FOR TEACHING STEEP SKIING

(Use a combination of the above methods and relevant exercises/analogies and tactics)

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POWDER SKIING

SKIING IN VARIOUS DEPTHS OF NEW OR UNTRACKED SNOW.

Completion

- The completion of the turn happens much sooner as the snow's surface helps to control the skier's speed by packing against their legs. Therefore, a finished turn will slow the skier down too much and be difficult to get the next turn started.
- The skier starts to flex during this phase to generate more powerful leg turning through the thick and sometimes grabby snow.

Transition

- From a flexed position on compacted snow the skier rises sharply bringing the skis to the top of the deep powdery surface. At first, it is almost like a bouncing or hopping move which is later refined when the skier becomes more efficient at powder skiing.
- The pole swing and plant assists in the rhythm and timing of this extension and flexion movement.

Middle

- The legs continue to extend developing even greater edge angles and contact with the snow.
- It is important through this extension phase that discipline remains in the upper body so that angulation and balance on the outside ski can continue to form.
- At the point of maximum extension the legs and upper body are tall, ready to absorb the next mogul.

Initiation

- The rapid up motion in the cross-over brings the skis to the surface. The extension should occur with a closer stance where the skis are weighted more evenly.
- The pole plant takes place at the extent of the up motion.
- Now that the skis are closer to the surface and easier to turn, the legs start to twist them towards the fall line.

MECHANICS NEEDED FOR POWDER SKIING

Previous experience

All guests of any level should get the chance to experience skiing in powder.

Terrain ● ■ ◆

For beginner to intermediate skiers, 10cm of new snow on green and blue and black runs is a good way to experience powder skiing. For advanced skiers, 15 – 20cm of fresh, light snow on blue runs are the ideal conditions for learning powder skiing.

Bouncing in a traverse can help develop a feeling of porpoising through the snow

Why

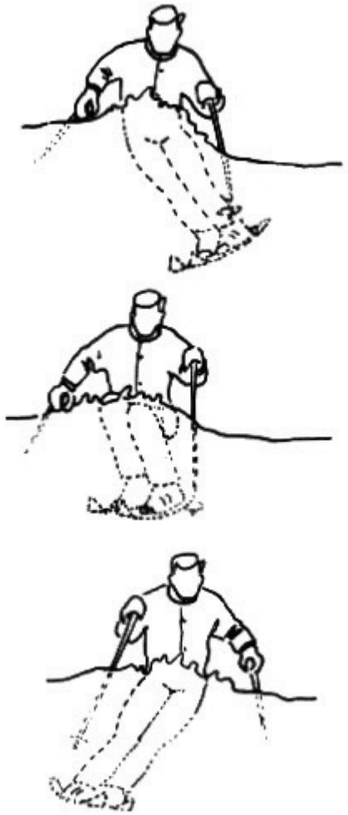
Bottomless powder skiing may be the most enjoyable of all the skiing sensations. There is nothing like the weightless, smooth, peaceful feeling of flowing through the powder, away from the crowds and the lifts.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Stance closer together.
- Spread out body weight over both feet during the turn.
- New sensation of getting the ski to float.
- Aggressive extension/flexion. This is refined to a retraction/extension movement once the speed is increased and the dynamic nature of the turn warrants it.
- Strong leg turning.
- Subtle change to turn shape that needs to travel down the hill.

Method for teaching powder skiing

- Start with a safety discussion on appropriate places to ski, falling, loss of skis and finding them etc.
- Warm up getting used to skiing with a more even weight distribution and a closer stance.
- Straight run or traverse (depending on the steepness of the terrain) through the powder bouncing up and down to get a feel of the snow consistency.
- Try shallow linked turns with ONE bounce per turn. The turn shape should flow from arc to arc down the hill.
- Try varying the radius, emphasising strong leg turning and minimal upper body movement so as to not disrupt balance.
- Once comfortable with the speed, advanced skiers use similar movements to a retraction/extension to replace bouncing. It is less tiring but a straight run with a few bounces will often be needed to get started.



KEY POINTS WHEN TEACHING POWDER

- Certain movements make it easier to ski powder:
  - More up and down movement (to begin with) to help unweight and turn the skis.
  - A stronger turning force from the legs to overcome the resistance of the powder.
  - Closer stance to provide a platform with the skis with more even weighting to float on the new snow easier.
- Some adjustment of balance to the heel of the foot may be needed to help the front of the ski float in heavy conditions.
- Avalanches are not common in Australia but they do occur. Before venturing into steeper off-piste areas, consult with ski patrol to check on the conditions.
- Explain to the students how to get up and look for lost skis.
- Always ski with a partner.
- Always adhere to trail and boundary signs.
- Specialised, wider powder skis greatly enhance the learning experience in deeper powder.
- A retraction/extension movement can only be used once the skier is moving and has enough speed to create a platform from which to first absorb. This is why many skiers start a run by straight running and making a few rhythmical bounces.

COMMON POWDER SKIING PROBLEMS AND THEIR SOLUTIONS

	Common problem	What you see	What you teach	Exercises and consolidation
BEGINNER	Sitting back	Student is sitting back trying to get the tips up on the surface of the snow.	Explain the concept of getting the ski to float or porpoise to aid turning without leaning back.	– Bouncing across or in the fall-line (terrain dependent) – Use easier terrain, flatter or less deep snow – Can shuffle or pedal across the hill to feel one leg at a time
	Stance too wide	Daylight between the legs. This may open and close through the turn/ traverse.	Keeping the skis/ boots closer together. Constant leg tension by squeezing the feet and knees together.	– Bouncing in a close stance. – Exaggerating a close stance on the groomed runs – Analogies such as holding a tennis ball between the boots without dropping it – Holding a glove between the feet
INTERMEDIATE	One ski sinks (tips diverge)	Skier does the splits and often falls forward as one ski tip hooks up. Can be inside or outside ski.	Even weight distribution.	– 50/50 weight on boot feet – Bounce through both feet like a kangaroo – Bouncing on the spot and in a traverse to porpoise both skis
	Leaning in	Skier leans into the turn and puts too much weight on the inside ski. The outside ski runs straight and they end up diverging.	Roll ankles and knees into the turn. Keep the upper body upright and stable.	– Groomed run angulation exercises before going into the powder. Storks, swords, edge rolls, etc. – Easy terrain and shallower turns – Hop with both feet through turn initiation – Jump turns – Aggressive flexion/extension
ADVANCED	Speed control	The skier's turns are very straight. Their stance usually widens and balance is lost. May result in falling.	Build confidence in turning. Emphasize the stronger turning effort. Use easier terrain at first.	– Single bouncing J-turn as back-up plan – Bouncing garlands – Funnel bounce turns – Stem Christies can aid turn initiation & build confidence – Use powder skis
	Falling forward	Front sault over the tips of the skis. Skier looks floppy in trunk.	Heel pressure and strong core.	– Bounce down through the heels – Lift toes up inside ski boots
	Finishing turns too much	The skier will find it hard to start each turn as they will be going too slowly and the skis will sink.	A turn shape that skis more arc to arc down the fall line. Releasing the turn sooner.	– Bouncing in a straight line on easy terrain working into shallow turns. – Powder 8's with a partner/instructor
	Popping too much	The skier continues to pop up and down to free their skis from the powder. The skier will look energetic and jerky.	Refine to retraction/ extension turns.	– Ret/Ext turns on the groomed – Pulling the knees to the chest at the completion of each turn – Ski powder with small, old bumps underneath

WRITE YOUR OWN PROGRESSION FOR TEACHING POWDER SKIING

(Use the above method and relevant exercises/analogies and tactics)

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CRUD SKIING

CRUD IS A TERM THAT DESCRIBES POWDER SNOW THAT HAS BEEN TRANSFORMED BY SKIERS AND/OR WEATHER CONDITIONS TO ONE OF THE FOLLOWING: CHOPPED UP POWDER/ WIND PACKED SNOW/BREAKABLE CRUST/HEAVY, ROTTEN SPRING SNOW/RAIN AFFECTED SNOW.

Previous experience

Your students should already have experience with off piste skiing and carved short/medium turns on the groomed runs.

Terrain ■ ◆

Blue terrain is the best choice as too flat a terrain will make the skier go too slow. Slowly move to steeper terrain and the cruddy conditions as the student improves their skill set.

Why

- **It provides variety and a challenge to advanced skiers.**
- **Like advanced moguls it is a true indication of your expert level of skiing.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **Stance closer together.**
- **Even body weight over both feet during the turn (depending on depth).**
- **Aggressive extension/flexion. This is refined to a retraction/extension movement once the speed is increased and the dynamic nature of the turn warrants it.**
- **Strong leg turning.**

MECHANICS OF SKIING IN THE CRUD

To ski successfully in the crud, as it is a constantly changing medium, a vast repertoire of all previously learnt turns will be of use. A good feeling for pressure control combined with an aggressive attitude will be of greatest benefit.

Method for teaching crud skiing

- Warm up skiing some medium turns with your feet close together exaggerating the stance needed to ski in the crud.
- Jump turns on a groomed blue run, jumped initiation with a steered finish (soft Speiss).
- Move to some cruddy conditions and do single turns as above, focussing on the aggressive extension/ flexion needed to get out of the crud.
- Link jump turns in the crud.
- If the conditions allow it, reduce the jumping and turn more in the snow with a retraction/ extension movement.

KEY POINTS WHEN TEACHING CRUD

- As it is a constantly changing medium, a vast repertoire of movements will make it easier to initiate the turn. From bounces, stems, retraction/ extension to jump turns.
- The amount of up motion depends on the skill of the skier and the difficulty of the conditions. The more difficult the conditions the more the skis are jumped out of the snow and turned in the air.
- The true expert uses a technique that combines jumping with a retraction/extension movement.
- If the skis are not edged, the inconsistency of the chopped-up powder bounces skis around that are relatively flat and throws you off balance. The skis need to slice through the crud.
- As it can be quite easy to fall and even injure oneself in the crud, always consider the guests' standard when assessing the following:
  - Depth
  - Consistency
  - Steepness.

COMMON PROBLEMS

See previous turns and match up to what the guest is doing.

WRITE YOUR OWN PROGRESSION FOR TEACHING CRUD SKIING

(Use the above method and relevant exercises/analogies and tactics)

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SWITCH SKIING

SKIING BACKWARDS IN CONTROL

Previous experience

Students must be able to make at least steered parallel turns (forward) before attempting the manoeuvers in this section.

Terrain

Green runs to start off with transitioning to blue groomed runs once they consolidate their skills.

Why

Switch needs to be something that you want to learn, it can be thrilling and very useful for entering and exiting jumps.

MECHANICS OF SWITCH SKIING

The skier makes parallel turns but the stance needs to be adjusted to suit riding 'switch' (backwards). The calves will be pressed more firmly into the boot although the basis is still a centred position. It is important that guests can ski while looking over their downhill shoulder to see where they are riding and for safety reasons.

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Safety when skiing backwards
- Centred position with calf pressure
- Shoulder rotation to allow the head to twist over downhill shoulder

Method for switch skiing

- Warm up with some steered medium turns.
- Stationary - show a balanced stance for riding switch (more calf pressure).
- Backwards snowplough 'J' turn to a stop, do both sides.
- Backwards parallel J-turns to a stop on both sides.
- Traverse backwards looking over downhill shoulder (for safety).
- Backwards traverses linked with snowplough turns.
- Linked backwards traverses with sweeping parallel turns (poles can be used for assistance with instructor going forward).
- Shorter linked turns, backwards, with head always looking over downhill shoulder (to aid rhythm).
- Aim to work the skis into parallel from the bottom up, like a basic Christie, until they are in constant parallel.
- Parallel short turns, backwards is a good goal to work towards for jumps like:
  - 180 over roll-over
  - 360 over roll-over (both need good rotation so use head and shoulders to aid rotation and to spot landing).

KEY POINTS WHEN TEACHING SWITCH

- **All guests should have twin tip skis as a safety precaution to ski switch.**
- **It is best to teach these progressions in an open area away from obstacles and traffic. Make sure they have warmed-up well before starting to ski switch.**
- **Freeride should be taught in a relaxed atmosphere to allow the culture of free expression to grow.**


Switch snowplough turns

COMMON SWITCH SKIING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Not looking over downhill/outside shoulder	Not looking over the correct shoulder or looking straight back up the hill (not safe as it produces a blind spot).	Explain the need for looking where you ski. Work on turning the head & shoulders to see.	– Practice single turns each side – Practice in slower switch snowplough turns – Use a staggered stance (exaggerated tip lead) to allow the body to face more downhill – Hold poles & use teacher assistance to move the skier's body
Breaking at the waist	Bent over at the waist with stiff legs, not much ski control.	Even flex & balance over the foot.	– Move to flatter terrain – Increase shin pressure through bending ankle & knee – Stand taller at the waist
Too much shin pressure (leaning uphill)	Skier will look stiff and be heavy on the tongues of their boots.	Even flex with calf pressure to allow CoM to keep up with the skis.	– Explain that the calves are needing to touch to boot to stay balanced when skiing backwards -Move to flatter terrain and work on calf pressure

WRITE YOUR OWN PROGRESSION FOR TEACHING SWITCH SKIING

(Use the above method and relevant exercises/analogies and tactics)

INTERMEDIATE RAIL/BOX SLIDES

SLIDING A MAN-MADE FEATURE SIDEWAYS SUCH AS A BOX OR RAIL WITH THE SKIS PERPENDICULAR TO THE FEATURE.

Previous experience

All guests should be able to do parallel turns, side slip and have previously skied straight over a box.

Terrain feature

A short box that is close to the ground and without a gap from take-off to feature is ideal. A plastic sheet on the snow can also be used as an introductory step to sliding sideways.

Why

- **Boxes and rails are further features to test a skier's skill.**
- **They are also a good option for advanced skiers in times of low snow and limited terrain.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- **ATML**
- **T=Popping onto the box sideways**
- **M=Sliding sideways, and**
- **Low, wide balance position**

MECHANICS OF INTERMEDIATE BOX SLIDES

Side slipping should be referenced as it is used extensively in rail sliding. Intermediate box slides include popping on and off a box with a 90° rotation to allow the skis to side slip across the box. Sliding should be done in a low balanced position (Centre of Mass over the feet) with the box (rail or snow) under the middle of the feet, with the skis flat. Hands in a wide position and eyes focused on the end of the slide to aid balance.

Method for intermediate box slides

- Introduce the student to the fun box or plastic rail showing the take-off, sliding surface and landing area.
- Warm up allowing the guest to pop on and pop off a fun box in a straight run.
- Try sliding the box (or grounded plastic) in boots to feel the sideways slipping motion. Practice in a low/wide stance.
- Ski over fun box straight running, twist the skis at the end of the box (try pivoting with a flat ski) and straighten again for the landing.
- Or, if on a dug-in plastic rail, ski in at a 45 degree angle. As they ski over the rail, they need to flatten their skis, lean downhill and slide the rail in a square position.
- Ski in a flexed position, rise and rotate 90 degrees until side slipping, then slide or pop off the end.
- Practice both sides.
- Get student to pop on and pop off box with balanced sideslip.

KEY POINTS WHEN TEACHING BOX SLIDES

- Leaning slightly down slope, looking at the run-out can help with balance.
- Take the guest to lots of natural terrain features like ridges, humps and bumps to get used to sliding with tip and tail in the air and the snow being directly under their feet.
- Start on a wide box, plastic sheet on the snow or two pieces of plastic conduit set in the snow. Only take a guest to a metal rail who has had lots of experience.
- Care must always be taken when choosing correct terrain as features such as rails/boxes are built in different sizes and taking your guest to one that is too large or narrow is the same as taking a beginner to a black run.
- Constantly maintain these features (especially the take-offs) if they are on the ground so your guests do not trip over on protruding pieces of plastic.
- Snow conditions such as ice and powder can make some terrain features difficult.
- Always observe the terrain park etiquette.
- Other suggested safety equipment includes helmets, mouthguards and body armour.
- A good warm-up is a necessity before doing any freeride skiing to help limit the chances of injury.

COMMON RAIL AND BOX PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Slipping onto their hip	Skier can get onto the rail/box at 90' but slips straight onto their hip. Shoulders are often angled uphill.	Manoeouver Teach skis flat and the sensation of slipping sideways. Even weight, wide stance (gorilla stance) with shoulders at same slope as the box.	– Use a box with less downward slope. – Practice side slips on natural features. – Point at the end of the rail to aid balance on downhill ski. – Exaggerate the balance on the downhill ski, try lifting uphill ski.
Falling off the rail (forwards or backwards)	Skier has enough speed but tips off the rail either forwards or backwards.	Manoeouver Teach to balance the feet over the rail when sliding.	– Teacher assistance. – Use Freestyle max. – Dye on natural features.
Falling off the middle of the rail while slowing down	Skier slows down and slides off the rail.	Approach Need to maintain speed while sliding.	– Start higher on the run-in. – Use plastic pipe to practice on (it can be slower but it's good to try going faster in a safe environment). – Focus on the end of the rail & the run out.

WRITE YOUR OWN PROGRESSION FOR TEACHING INTERMEDIATE BOX/RAIL/SLIDES

(Use the above method and relevant exercises/analogies and tactics)

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HALF PIPE

SKIING DOWN A MAN-MADE FEATURE IN THE SHAPE OF HALF A DRAIN PIPE AND USING THE WALLS TO GAIN AIR.

Previous experience

Parallel skiers can enjoy riding up and down the transition of a pipe but carving is a prerequisite for exiting a pipe.

Terrain

All introductory manoeuvres are taught on green to easy blue terrain and do not need to include terrain parks as there are plenty of natural terrain features on the mountain to promote learning, before heading into the man-made pipe.

Why

Pipe riding is one of the most exciting man-made features available in ski resorts and when uncrowded it is accessible by many levels of skiers.

MECHANICS NEEDED FOR RIDING HALF PIPE

The halfpipe is an exciting terrain feature to experience. As most pipes are quite large you will get a better result by working on your guest's carving skills out of the pipe first on natural wind lips etc. as strong pipe riding takes a good understanding of carving and the skill blending needed to achieve this.

Mechanically the skier uses:

- **Strong edging skills to both grip the pipe and control direction throughout.**
- **Dynamic stance through all three joints to keep the body perpendicular to the angle of the slope.**
- **Jumping technique (static, pop or absorption) to deal with the shape of the coping (over-vert or under-vert) when exiting.**
- **Full body rotation to control direction in the air.**
- **Confidence and commitment.**

FUNDAMENTAL MECHANICS TO BE TAUGHT

- Edge control
- Leverage to maintain the body at 90° of the surface
- Pressure control to deal with changes in terrain
- Body rotation to re-direct travel when in flight

Terminology

Platform, shoulder or deck: the flat part at the top of either side of the walls (where you walk up).

Coping: the edge at the top of the walls.

Flat bottom: the floor of the pipe, in-between the walls.

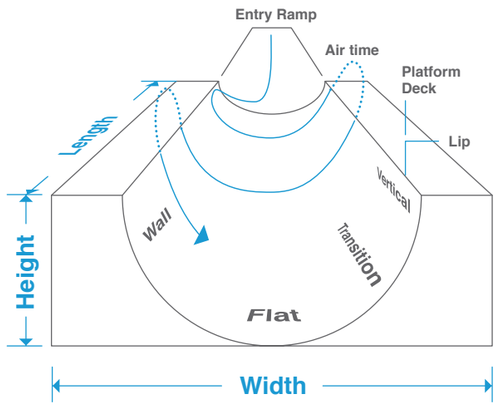
Transition: the curved bottom part of the walls.

Vertical: the top part of the walls.

METHOD FOR SKIING HALF PIPE

Out of the pipe:

- Warm up skiing medium carve turns in a corridor about the size of a half pipe.
- Using natural wind lips or gullies, ski up the walls and twist to head back down: Focus on using upper body rotation to head back down the slope. This is done by combining an edge release with a turn of the head and shoulders back down the slope.
- Try with a small pop to get the skis off the snow and mimic the sensations.



In the pipe:

- Introduce them to the pipe, the terminology and etiquette involved in riding pipe.
- Show them the line to enter the pipe.
- Ski turns from transition to transition in a zigzag shape using the above rotation with a slight pop if in the transition.
- Gain confidence and speed and head higher up the wall using good edge grip to stop falling back down. Reduce the pop if on the 'vert'.
- Once they can reach the top of the wall, try a drop in from the shoulder (deck), then ski the pipe.
- When able to get above the coping try exiting the pipe and landing on the deck.
- Now the student can ski the pipe, but this time instead of heading up onto the deck they keep their legs stiff and strong (as in intermediate jumps with no absorption or pop needed) to allow them to exit the pipe into the air, rotating back in and landing on the transition.
- Work on reading the shape of the wall to determine if a pop (under vert.), stiff leg (vertical) or absorption (over vert.) is needed.

KEY POINTS WHEN TEACHING HALF PIPE

- You must consult with your snowsports school to find out the policy for jumping and taking groups into terrain parks such as waivers, ability levels, etc.
- Good jumping technique prior to riding pipe is preferable.
- Helmets are strongly advised.

COMMON PIPE RIDING PROBLEMS AND THEIR SOLUTIONS

Common problem	What you see	What you teach	Exercises and consolidation
Fear	Not being able to either reach the coping or exit the pipe.	Work on edge control up the transition & into the vert. Not just increased edge but an ability to release as well. Lots of pipe time to gain confidence with the feature.	– Carving up natural features – Make sure they can pop & revert off small natural walls – Side slip down the pipe's-wall at the top of each turn to get used to travelling down the pipe with flat skis
Compressing through the transition.	Skier either collapses at the waist or buckles in the legs through the transition. Can cause them to straighten their legs & pop out on take-off.	Teach the skier to hold their core strength through the transition & to stay 90° to the running surface.	– Keep muscles tense/strong – Look at the coping on the way up – Use freestyle max to show 90'
Landing on the flat bottom	Skier pops from the coping on take-off, moves away from the wall & lands down on the flat bottom.	Teach to read the cut of the wall; over-vert (absorb) under-vert (pop) & try to get them to jump down the pipe not away from it.	– Use freestyle max, do not pop if not necessary – Side slip down the pipe's-wall at the top of each turn to get used to travelling down the pipe
Speed control	Skier travels down the length of the pipe either too fast or too slowly.	Carving skills for the pipe but explain that the angle you cross the pipe will determine speed (and number of hits) while the angle up the wall will determine the height of air.	– Practice holding & controlling speed with carving on natural features – Build a mini pipe & use freestyle max to explain angles of attack
Not perpendicular	Can be caused by fear. The skier leans their body too far forward when climbing the wall.	Staying 90° to the pipe surface at all locations in the pipe.	– Feeling of leaning back when going up the wall – Drawing in the snow or freestyle max to demonstrate perpendicular position – Single ins and outs from the coping

WRITE YOUR OWN PROGRESSION FOR TEACHING HALF PIPE

(Use the above method and relevant exercises/analogies and tactics)

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5.6A COMMON ADVANCED EXERCISES

STANCE - ADVANCED

- Hopping – tips, tails, whole ski, during turning.
- Long skate and glides
- Active projection (through an imaginary doorway) into new turn
- One ski, no poles
- One ski through the bumps
- Boot skiing
- Short turns – poles held horizontal behind knees
- Hopping through the transition/traverse of a long turn

Squeeze the glove

Getting the stance closer together for situational skiing like powder, crud and moguls.

- Try on easier groomed run at 1st.
- Place your glove between the student's ski boots and ask them to squeeze their feet together and hold your glove.
- Try some turns holding the glove all the way through. A constant muscle effort will be needed to hold the glove there without dropping it.
- Remove the glove and try to ski with the same squeezing sensation.
- Try the sensation in your desired situational skiing task.

Boots undone

Helps to find balance over the whole foot and a stance that doesn't rely on the front of the ski boot for support.

- Undo the power strap and loosen the rest of the buckles. It is safer to leave the buckles latched in the ladder as opposed to fully undoing them.
- Encourage feet and toes staying relaxed – feeling the whole foot (avoid clawing/clenching with the toes).
- Ski some turns feeling the above.

Double pole plant

Moving forward through the transition of pure carved turns

- Swing both poles through the transition.
- The touch is not imperative but the student should focus on how the swing moves the body forward during the cross-over

ROTARY - ADVANCED

- As many turns as possible – feet apart, feet together
- Draw two fall-lines 3m apart, turn tips from one to another
- One ski skiing
- Backwards Wedeln
- Give them dry land exercises such as yoga to help improve flexibility.

Basic javelin turns

Leg turning, hip position and separation.

- Start in a snowplough position, lift the tip of the inside ski after the fall line continue to turn the outside ski's tip under it via leg rotation.
- The more the skis cross, the more separation the skier developed.
- Practice this leg turning sensation and any desired parallel turns.

Javelin hockey stops

Leg turning, upper/lower body separation in short turns.

- Face down the fall line in a bullfighter position.
- Once some momentum is gained, lift the inside ski and hold it facing down the hill as you turn the outside ski underneath.
- The more the skis cross, the more separation the skier has developed.
- Practice this leg turning sensation in short turns.

Maximum short turn challenge

Leg turning and upper/lower body separation. Also a good exercise for foot speed and agility.

- Challenge the student to do as many short turns between 2 points.
- The emphasis is on speed and the amount of turns not the performance.
- You can turn this into a competition within your classes to see who can do the most.

Hard Speiss

Leg turning or separation drill, pressure control exercise and to develop athletic quick movements.

- Stationary practice hopping in the air. Focus on flexing and extending all 3 joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first to make it easier for a novice at Speiss turns.
- Move to an easy slope so the skis don't slide too much and try linking a couple of turns each way.
- Add in a solid pole plant to help with stability and timing.
- Try on steeper slopes that will require a greater range of twisting.
- Can be done on one ski.

Poles on hips (the cage)

An awareness exercise for hip discipline and leg turning.

- Connect the pole loops to the opposite handle so that the poles stay on the pelvis as you ski. The student can gain an awareness if the poles and therefore the hips are rotating and or tipping into the turn.

EDGING - ADVANCED

- Tug-of-war
- Speiss on edges
- Noodle legs (edge rolls where the knees are pointed out then in again making the skis leave an hourglass rail road track)
- Repeated edge sets through a long turn
- Javelin turns (inside ski is lifted and tip placed over the outside turning ski for hip position)
- 1000 step turns for inclination
- One legged garlands

Pivot slips (Braquage)

Good for edge control and rotary. Check students can sideslip confidently prior to this exercise.

- Sideslips in both directions focused on flattening both skis at the same time.
- Add a pivot of both skis after the flattening phase. Explain that you want to pivot the skis from the centre of your ski boots. Imagine there is a metal pin coming out from under the middle of each ski boot and that this is locked into a rail in the snow that only allows you to turn from this central point. Like a helicopter's rotor blades.
- Work on upper body discipline after the student gets a feel for the correct pivot point.

* Be aware of snow conditions as heavy slushy snow makes this very difficult.

Sliding natural features

Fun progression after pivot slips or side slips using terrain to help.

- Look for natural convex features or terrain that could be like a natural box or rail to slide. Mini ridges of snow on the edge of runs are perfect.
- Ski onto the high point of the snow feature and pivot both skis sideways. Aim to keep the middle of both feet on the highest point.
- Attempt to slide/grind the feature as far as possible.
- Challenge to change directions more than once on the same feature.
- * Be smart about snow conditions.*

Power wedelns (carved)

Strong edge grip in dynamic short turns.

- Re-explain a snowplough wedeln and practice.
- Show the student how to roll and hold the ski onto a high edge angle. Press hard onto the arch of foot (point out some gritting of the teeth is needed).
- Use a strong leg to power the skis around to get the short turn.

Edge rolls

Develop edging movements from the ankles and knees. Can be used into dynamic short turns to promote early edging.

- Stationary on flat terrain roll ankles and knees from one side to the other (use poles for support).
- On easy green terrain link narrow edge rolls down the fall line with the same movement.
- Try to isolate the edging movement by trying to do this in a railed performance.

Cowboy turns

Early edging for short turns.

- Practice short turns with a very wide stance.
- Gain a feeling for twisting the ski while it's on the edge.
- Narrow the stance back to a neutral width and try to replicate the same feeling of guiding the skis on their edges.

Schlopy turns

Progressive edging and angulation in pure carved medium/long turns.

- Try some pure carved medium turns with no poles, hands up and in front of the body.
- Progressively lower outside hand to touch the outside boot.
- Start the movement just after the initiation and continue the movement to turn completion.
- Once the hand touches the boot, transition into the new turn.

Crab walk

Stronger edging through ankle and knee angulation. A good drill for feeling the sensation of railing.

- On easy terrain start in a snowplough position facing down the fall line.
- From a flexed stance roll the ankles and knees as much as you can to tilt 1 ski over on its edge.
- Practice this in motion, aiming to lock the outside ski on its edge, change direction slightly and then switch to the other leg.
- Connect this new edging sensation into the desired turn.

Skating

Early edging, ankle and knee angulation and cross-over.

- Skating on flat terrain trying to feel rolling from the little toe side of the foot to the big toe side.
- Skating in the fall line on easy green terrain focusing on the above.
- The early edge feeling can be built into carved short turns by adding the rotary or crossing over in dynamic medium turns.

Heisman drill

Rotational alignment in pure carved medium/long turns. This will help develop stronger hip angulation.

- Outside hand on hip, inside hand pushes forward.
- Direct the inside hand downhill to develop more counter if needed for the angulation.
- Switch hands in the transition.

White pass turns

Cross-over in pure carved medium/long turns. Early edging and inclination.

- Crossing-over with weight on the inside ski.
- Lift outside ski through the transition/initiation, this causes the upper body to have to cross the skis.
- Drop outside ski and transfer weight back to outside ski from middle to turn completion.

Pure carve snowplough with in-rigger

Hip position. Encourages progressive edging and lateral movement throughout a pure carved turn.

- At lower speeds use a wider snowplough.
- Lock the outside ski onto its edge with ankles and knees first.
- Shorten the inside leg to allow the hips to move in.

Hip to the snow

Hip angulation, hip position and encourages progressive edging and lateral movement throughout a pure carved turn.

- Stationary practice of moving the hip laterally and down towards the snow. Use partner assist or ski pole for balance. Explain that the hips move on an arc toward the snow not just on a straight line laterally.
- Get down on snow in static skiing position with inside hip/buttock on snow showing longer outside leg and shorter inside leg. This would be maximum possible edge position. Point out the need for a small amount of separation/counter to achieve this.
- Static: if the snow is soft try toppling over with the focus of the inside buttock cheek landing on the snow first as opposed to the knee. You can also use a soft snow bank.
- Try moving hip close to the snow in a fast J-turn keeping balance on outside ski.
- Link dynamic turns focusing on points inside the new turn that you move your hip towards.

PRESSURE CONTROL - ADVANCED

- Aeroplane turns in moguls
- Retraction/extension turns (see progressions)
- Start the turn on ball of foot and finish on heel (leverage, working entire ski)
- Pre-jump bumps (absorb before hitting the bump in anticipation of its size)
- Try to get maximum pressure at end, middle or start of turn
- Jump turns landing softly (soft Speiss)
- Push and pull feet (fore and aft) while turning (Austin Powers turns)
- Slow turns through the moguls to exaggerate the bend and stretch movements (slow dog noodle).
- Turn slowly, then quickly, through moguls
- Turn on inside ski to fall-line, then change to outside ski

Using a spine for extension retraction turns/absorption

The spine can help with feeling the timing of when to retract in the transition and when to extend the legs to the side. It's a great tool to practice the feeling of absorption outside of the moguls.

- Draw a $ in the snow and explain how to ski over the spine using it as the straight line through the $ sign.
- Ski the spine keeping the CoM at the same height off the snow.
- Actively retract the legs when the spine starts to push up against the feet and actively extend the legs when you feel light pressure once the feet have gone over the spine.
- Ski different turn sizes and speeds over the spine to develop versatility.

High speed moguls traverse

Absorption, pressure control, touch and balance for off piste skiing.

- Have the student ski fast across a bump field.
- Work on soaking up the impact with legs while the upper-body stays stable.
- Try to keep ski/snow contact.

Hold your absorption (for timing)

- Work on holding your absorbed position until the backside of the bump falls away from you. If you extend too early snow, contact will be lost.
- External cue: imagine a glass ceiling above your head that you don't want to breakthrough. Extend at the same rate as the terrain falls away from you.
- Best to demonstrate this exercise from side on. Analysis from side on too.

Jump turns

Pressure control movements in powder and crud to make the initiation easier.

- Stationary practice hopping in the air. Focus on flexing and extending all 3 joints.
- On very flat terrain try hopping and twisting the skis with the legs while remaining strong and stable in the upper body. You can do this without skis on first to make it easier.
- Try some medium carved turns with this hop at the initiation.
- Add in a solid pole plant to help with stability and timing.
- Try in the powder/crud to get the skis on top of the snow at the initiation. Making it easier to twist them.
- Practice a stronger leg turning action to power the skis through the deep snow after the initiation (i.e. when the skier lands).

Dolphin turns

Pressure control, practice the feeling of fore aft movement of the feet for moguls.

- Find some well-spaced, medium sized bumps most likely found in the afternoon on a chopped up groomer or a spine on the side of a run.
- Show how to pop off the bump into the air then bring the tips down by pulling the feet back on the backside of the bump.
- Practice on individual bumps.
- Intro the concept of pushing the feet forward up the face of the bump as you pop so your feet are slightly in front of your CoM on take-off.
- Try dolphins with the same movement without leaving the snow.
- In the bumps use the pedalling backward analogy to help with absorption and extension.

Drunken sailor

Pressure control in dynamic turns. Develop a greater range of extension and retraction for situational skiing.

- Try making railed/pure carved turns on an easy slope focusing on keeping the centre of mass at the same height off the snow.

Single Sailor, on easy terrain, start in a low flexed position facing down the fall line.

- Extend one leg to the outside while keeping the CoM and head low. Allow the ski to be placed on its edge (slight snowplough shape) and rail back to the body.
- As the ski comes back to the body flex/retract the leg so the body is undisturbed.
- Repeat this several times on one leg to get the feeling of extending the leg, feeling the pressure build and retracting it to the body to control it.
- Repeat above on both legs.

Drunken Sailor, alternate the above sensations from leg to leg in the fall line.

- Work this movement back into dynamic parallel turns feeling the range of extension/retraction as felt in the drunken sailor.
- A reverse funnel starting with low edge rolls can be useful for this.

OTHER EXERCISES

Figure 8's (powder 8 synchronised skiing)

Corridor skiing

Helps to create a grid for skiers to quantify the outcomes of the turns. Helps them understand the path the skis should take and how the skier should be deflected from side to side in a short turn

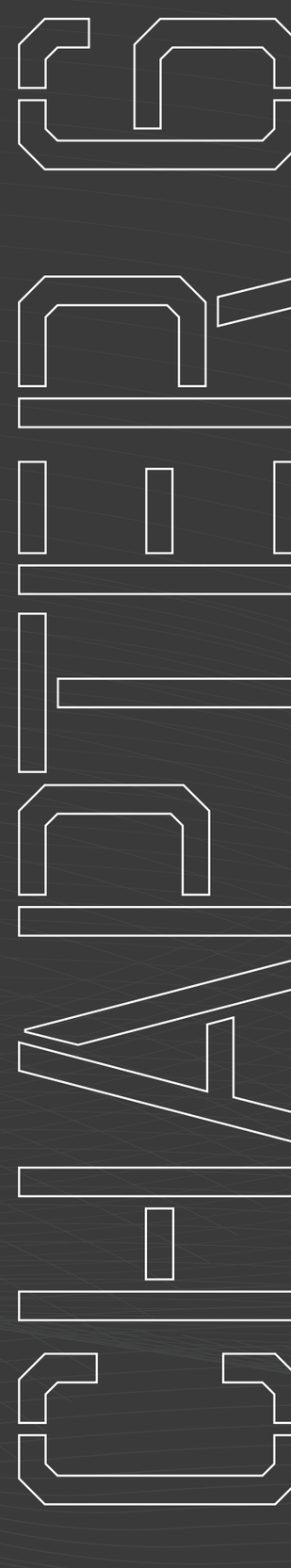
- Holding your poles in the swords position ski straight down the fall line and Draw 2 lines in the snow. This should leave 2 lines in the middle where your skis have been and 2 outside lines where your poles have left a mark.
- Get the students to ski down doing short turns guiding the skis outside the outer lines from one side to the other while facing down the hill with their upper body.
- If there is too little early edge or if the twist is not progressive the skis will not be directed to the outside of the lines before the fall line.
- Work on grip then twist to encourage a better path and earlier edge.
- Although the skiers upper body is facing down the hill the centre of mass should still be going side to side over the centre lines.

TEACHING TELEMARK SKIING

About this chapter

Not all guests are the same and, as a result, certain components of this manual may need adjusting to best suit their individual needs. Adaptations may be small or large depending on the individual.

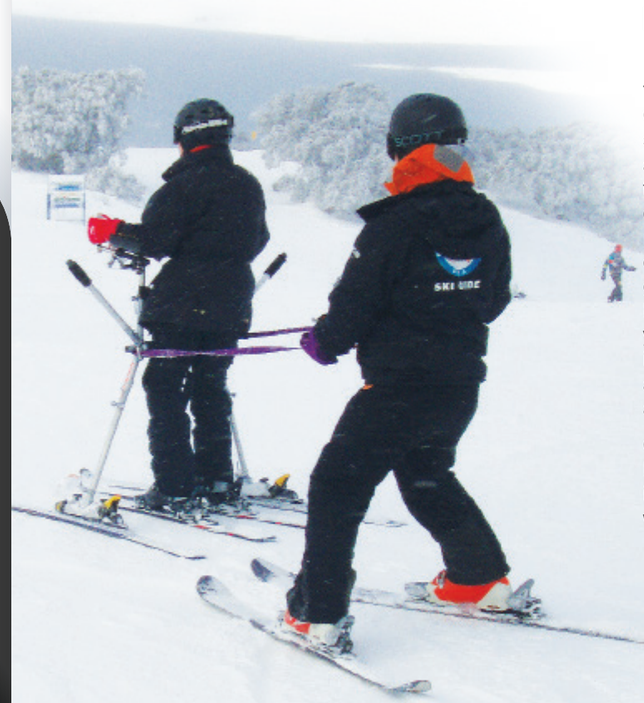
Chapter six gives instructors the tools needed to adapt their teaching to suit the needs of riders with disabilities.



CHAPTER SIX: Adaptive snowsports

SECTION ONE:

ADAPTIVE SNOWSPORTS



6.1 INTRODUCTION

6.1A WHAT IS ADAPTIVE SNOWSPORTS?

Every guest that visits a snow resort in Australia should have the opportunity to participate in snowsports, regardless of their ability. Adaptive snowsports is skiing and snowboarding for a person with a disability. To make this possible, you can make adaptations to your guest's equipment and surroundings to make the experience more accessible or comfortable. You can also adapt the teaching style and progression you use to suit your guest's needs. The adaptations you make will depend on your guest's ability and their goals. Disabilities your guest may have may be cognitive (affecting their thinking, understanding, learning, memory or social skills), physical (affecting their body movements or abilities), a vision impairment or any combination of the above.

6.1B WHO IS TAUGHT ADAPTIVE SNOWSPORTS?

Giving all our guests the opportunity to ski and snowboard means we have guests with a range of abilities. Our guests may be young, old, fit, unfit, excited, timid, wheelchair users, vision impaired, independent or countless other things. Your guest may have one or multiple disabilities. Some disabilities are immediately obvious, while others will require information from your guest. When your Snowsports School takes your guest's booking, they may receive some information about your guest and their disability. If they have limited or no information, you will need to make some observations and ask your guest some questions about their ability and disability.

Observing how your guest moves and gets around before they even put on boots can give you valuable information about how and what to teach them. Focus on what your guest can do, not what they can't.

Asking your guest about their disability can be uncomfortable or intimidating for some instructors. Some guests will be accustomed to answering questions about their disability, while others won't be so forthcoming, especially if they have a newly acquired disability. Being respectful and professional will help put your guest at ease and make the exchange normal. Again, focus on what your guest can do, not what they can't. Here are some helpful general questions:

- **"Can you tell me a bit about your disability?"**
- **"Is there anything about your disability that I need to be aware of?"**
- **For physical disabilities – "Can you show me which parts of your body you can move?"**
- **For vision impairments – "Tell me what (colours / how far / how wide) you can see."**

If you've asked your guest questions and they are unable to answer them – often related to a cognitive disability – it can be helpful to ask their carer, parent or partner.

Some of the disabilities you may encounter include:

- **Acquired brain injury**
- **Amputations**
- **Autism**
- **Cerebral palsy**
- **Diabetes**
- **Down's syndrome**
- **Epilepsy**
- **Hearing impairment**
- **Intellectual disabilities**
- **Multiple sclerosis**
- **Muscular dystrophy**
- **Spina bifida**
- **Spinal cord injuries**
- **Vision impairment**

Disabled Wintersport Australia's 'Adaptive Snowsport Guide Manual' is a useful reference for further information about the above disabilities and how they relate to snowsports. It can be found at www.disabledwintersport.com.au. Search the internet for further information on disabilities.

Here are some helpful observations to make:

If they are walking:

- **Are they using crutches? Would snowboarding, 3 or 4 track skiing or sit skiing be most appropriate?**
- **How well are they walking? Are they able to use their ankles, knees and hips? Are their legs swinging independently of their body?**

If they are in a wheelchair:

- **Is it an electric or manual wheelchair? If it is electric, a tethered bi-ski may be most appropriate. If it is manual, would a bi-ski or mono-ski be more appropriate?**
- **Are they pushing themselves or is somebody pushing them? This will give you an indication of their independence.**
- **Does the wheelchair give them a lot of support (high backrest, straps, anti-tip wheels at the back) or is it a very manoeuvrable, sporty looking chair? This will give you an indication of their balance and the support required from the sit-ski straps.**
- **How well do they grip the wheels or your hand during a handshake? Will they be able to grip and manoeuvre outriggers and hold themselves up?**

P.E.E.L.

6.1C HOW DO YOU TEACH ADAPTIVE SNOWSPORTS?

Teaching people with disabilities requires a broad range of skills and knowledge about disabilities, equipment and communication. It may seem overwhelming at first, but many of the same techniques and tricks you use for your regular ski or snowboard lessons are applicable to adaptive snowsports. The acronym '**PEEL**' is a useful reminder of what to think about when planning your adaptive lesson.

P – **Progression. Do you need to change or adjust what you are teaching because of the equipment being used or the physical ability of your guest? Remember to keep your expectations of what will be achieved in the lesson in line with your guest's goals and their abilities.**

E – **Environment. Is your guest easily distracted, intimidated, scared or affected by elements in the area you are teaching? Are there environmental factors affecting your guest's ability to hear or see you? Consider noise from lifts, snow mobiles and crowds. Consider bright light from the sun, reflections off the snow and shadows from trees and buildings.**

E – Equipment. Is there equipment that will make it easier for your guest to learn? Do they need assistance making a snowplough? Do they need to sit down to ski? Do they need assistance balancing? Would a Sno-wing aid the guest? Are there any safety factors that need to be considered with the equipment you are using?

L – Learning Style. Is your guest more inclined to be a visual, auditory or kinaesthetic learner? Are there any factors that will make it difficult for your guest to learn in a particular style?

6.2 THE PROGRESSIONS

The following progressions are designed to help you teach people with disabilities to ski and snowboard. Bi-ski and Mono-ski are for people who need to sit down to ski. Three-track and Four-track are for people who can ski standing up but need outriggers to help their balance.

Every guest we teach is different and even more so in adaptive snowsports. Every guest's disability will present slightly differently to the previous one and may even change from the start of the day to the end. These progressions are not designed to be prescriptive. Adjust, add or omit parts of the progression as your guest requires.

6.2A BI-SKI

What:

Bi-skiing is skiing in a seat low to the ground on two skis. The skis are short with a deep side-cut, making it easy to make short, railed turns. Short outriggers can be used to aid balance.

Who:

The bi-ski is designed for people without complete use of their legs and limited trunk and upper limb control. This may include people with higher-level spinal cord injuries, amputations, cerebral palsy or spina bifida.

How:

The bi-ski is turned by tipping the ski over in the direction the skier wishes to go. The 'skis' side-cut allows for railed turns to be made in a short arc. The primary skill used to turn the bi-ski is edging. The bi-ski may be skied independently, on tethers or with assistance with someone holding onto the back of the bi-ski, known as bucketing.

Equipment:

- **The Mountain Man and the Bi-Unique are the two most common bi-skis. The Mountain Man has a small amount of suspension and a higher centre of gravity. The Bi-Unique has no suspension but has a lower centre of gravity.**
- **The seat the bi-skier sits in is often called the 'bucket'. 'Bucketing' is when the instructor holds onto the back of the bi-ski and assists the guest with steering.**

- **Tethers can be attached to the back of the bi-ski bucket. These can be used to give the instructor more control over the bi-skier's speed and turn shape. Aim to keep the tethers relatively taut and stay inside and uphill of the bi-skier's turn. This gives the tetherer greater power and the ability to keep the bi-ski under control.**
- **Fixed outriggers allow a guest with very limited upper body control to ski with a small amount of independence. Fixed outriggers can be fitted to both types of bi-skis but the Mountain Man fixed outriggers are much more stable. The bi-skier can shift their weight left and right to tip the bi-ski onto the outriggers. Fixed outriggers give great stability making it harder to tip over, however they greatly increase the turning radius of the bi-ski and make them difficult to stop. Tethers with a wrist strap or loop must always be used when fixed outriggers are in use. A fixed outrigger bi-ski must never be bucketed. Additionally, the fixed outriggers must be removed each chairlift ride for the safety of those loading and riding beside the bi-ski.**
- **Each type of bi-ski has a different type of chairlift loading mechanism. Ensure you know how the mechanism works before using the chairlift.**
- **Most bi-skis will require some manual lifting to ride the chairlift. If you have an assistant use them to help load the bi-ski. If you don't have an assistant you can ask a lift attendant to help you lift the bi-ski onto the chair. In both instances, ensure you communicate where to hold the frame, what the countdown will be and who will be in charge. Ask the lift attendant to slow the lift down and for a 'pull back'. A 'pull back' is when the lift attendant comes behind the chair you are loading and, when you have lifted the bi-ski up, pulls the bi-ski securely back onto the chair using the handle or strap. When lifting, ensure you keep your back straight and lift from your knees. A retention strap should be attached to the back of the bi-ski to allow the bi-ski to be attached to the chairlift.**
- **When unloading the chairlift ask the lift attendant to slow the lift. When the bi-ski reaches the unload line, tilt the bi-ski forward and slide it off the chair. Safely ski the bi-ski away from the unload area and, if necessary, ensure the loading mechanism is disabled.**
- **A draglift requires a rope that loops around the front of the bi-ski. The skier or lift attendant hooks the rope around the Poma or T-bar. The lift then drags the bi-ski along with it. The skier should**

slide their outriggers along the snow to maintain balance. Once the bi-ski reaches the end of the lift, the skier can unhook the rope using a release system, or when there is slack in the rope. The instructor can ride with the bi-ski by wearing a climbing harness and attaching themselves to the bi-ski with a karabiner.

- Outriggers should start shorter for beginners and lengthen as the guest improves, to be skied more like a mono-ski.
- The brake bolt on the outriggers can be lengthened to allow the claw to engage earlier and create more friction, or shortened to allow the outrigger to slide more freely.
- A fixed handlebar can be attached onto most bi-skis to allow a skier with mobility control difficulties in one or both arms to keep their arms in an anchored position.
- Tetra gloves are gloves made of Velcro that allow a skier's hands to be fixed to the handlebar or outriggers if they have difficulty gripping.
- It is a good idea to plan for some time out of the bi-ski to prevent pressure sores developing.

Method for teaching bi-skiing:

- Check for correct set up. Ensure there are no large gaps between the seat and the body which would allow the hips to move separately from the bi-ski. Ensure there are no pressure points or tubes being blocked. Ensure legs are bent comfortably.
- Equipment familiarisation. Show how bi-ski tips to turn, how chairlift loading mechanism works and operation and function of outriggers.
- Stationary, introduce the correct stance. Sit up straight, look ahead, comfortable leg bend, elbows slightly bent, outriggers directly out from hips or just in front (depending on comfort), even pressure on both outriggers.
- Flat land exercises. Pushing forwards and backwards. Pushing up and twisting. Leaning left and right.
- Getting up after falling over. Align the skis across the fall line. Let go of the inside outrigger and place hand on the snow for stability. In crutch mode, place other outrigger's claw in the snow next to the hips. Push up until inside outrigger can be held and balanced on. Return both outriggers to the outside of the body. Some guests may require help from the instructor. Pull on the bi-ski rather than the guest's arm.
- Straight runs. Ski down a gentle slope with a good run-out, practising a good stance and testing balance by lifting up outriggers. Drop elbows downwards and push hands forwards to engage claw on the back of the outriggers.
- Turns to one side. On a gentle slope with a good run-out, turn to one side by tipping hips in the direction you want to go. Maintain balance with the inside outrigger. Start with slight turns and gradually increase size of turns. Try to the other side.
- Linking turns. On a very easy beginner run, turn to one side. Once the ski is almost across the fall line, bring balance back to the centre. A push-off, the inside outrigger can assist this movement. Start tipping hips in the opposite direction. Maintain contact with the snow with both outriggers.
- Work on steering. Once your guest is ready to move to steeper beginner runs and intermediate runs, introduce rotation from the body from as close to the snow as possible.

Common Problems	Cause	Solution
Washing out the back of the skis after the fall line	Insufficient inclination to ensure sufficient edge from articulated system	Tipping lower body (as much as possible) while keeping upper body upright
	Weight too far forward	Check chest/shoulder straps firm
	Outriggers too long	Shorten outriggers
Can't link turns	Over-rotation	Start into new turn sooner
Regularly falling over using handheld outriggers	Insufficient strength/mobility	Use fixed outriggers
Outriggers skipping or pulling arm back	Outrigger too long	Shorten outrigger
	Too much outrigger brake	Shortened outrigger brake

6.2B MONO-SKI

What:

Mono-skiing is skiing in a seat which is attached to a shock absorber and one ski. The ski is generally a regular alpine ski. Outriggers are used to aid balance.

Who:

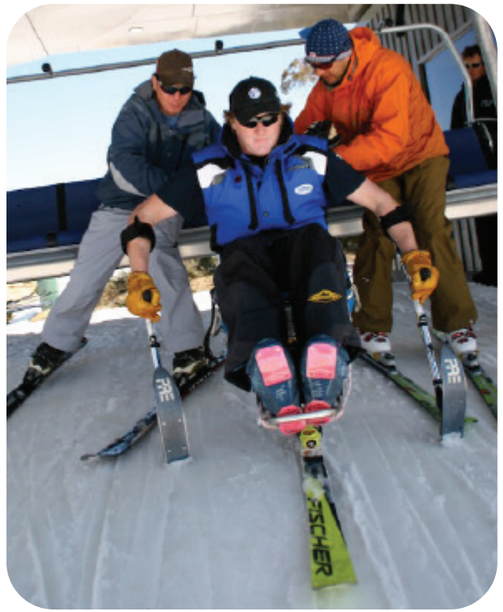
The mono-ski is designed for people without complete control of their legs and reasonably good trunk and upper limb control and strength. This may include people with lower level spinal cord injuries, amputations, cerebral palsy or spina bifida.

How:

Blending all four skiing skills turns the mono-ski. Movements should be made by the skier's body from as low to the snow as possible.

Equipment:

- A dual-ski is the same as a mono-ski but has two alpine skis, providing more stability. It should be taught the same as a mono-ski.
- There are many different types of mono-skis. When choosing a mono-ski for your guest you should consider bucket size, leg angle and position, loading mechanism and comfort (See Notes)
- Outriggers should start longer for beginners and shorten as the guest improves.
- The brake bolt on the outriggers can be lengthened to allow the claw to engage earlier and create more friction, or shortened to allow the outrigger to slide more freely.
- Each type of mono-ski has a different type of chairlift loading mechanism. Ensure you know how the mechanism works before using the chairlift.
- Depending on the guest, some mono-skiers will require some manual lifting to ride the chairlift. If you have an assistant use them to help load the mono-ski. If you don't have an assistant you can ask a lift attendant to help you lift the mono-ski onto the chair. In both instances, ensure you communicate where to hold the frame, what the countdown will be and who will be in charge. Ask the lift attendant to slow the lift down and for a 'pull back'. A 'pull back' is when the lift attendant comes behind the chair you are loading and, when you have lifted the mono-ski up, pulls the mono-ski securely back onto the chair using the handle or strap. When lifting, ensure you keep your back straight and lift from your knees. A retention strap should be attached to the back of the mono-ski to allow the mono-ski to be attached to the chairlift.



- **When unloading the chairlift, ask the lift attendant to slow the lift. When the mono-ski reaches the unload line, tilt the mono-ski forward and slide it off the chair. Safely ski the mono-ski away from the unload area and, if necessary, ensure the loading mechanism is disabled.**
- **A draglift requires a rope that loops around the front of the mono-ski. The skier or lift attendant hooks the rope around the Poma or T-bar. The lift then drags the mono-ski along with it. The skier should slide their outriggers along the snow to maintain balance. Once the mono-ski reaches the end of the lift, the skier can unhook the rope using a release system, or when there is slack in the rope. The instructor can ride with the mono-ski by wearing a climbing harness and attaching themselves to the mono-ski with a karabiner.**
- **It is a good idea to plan for some time out of the mono-ski to prevent pressure sores developing.**

Method for teaching mono-skiing:

- **Check for correct set up. Ensure there are no large gaps between the seat and the body which would allow the hips to move separately from the mono-ski. Ensure there are no pressure points. Ensure legs are bent comfortably.**
- **Equipment familiarisation. Show how alpine ski works, how chairlift loading mechanism works and operation and function of outriggers.**
- **Stationary, introduce the correct stance. Slightly rounded back, look ahead, comfortable leg bend, slightly bent arms with outrigger ski tip between knees and feet, even pressure on both outriggers.**
- **Flat land exercises. Pushing forwards and backwards. Pushing up and turning on the spot. Leaning left and right. Lifting the bucket into chairlift mode.**
- **Getting up after falling over. Align the skis across the fall line. Let go of the inside outrigger and place hand on the snow for stability. In crutch mode, place other outrigger's claw in the snow next to the hips. Push up until inside outrigger can be held and balanced on. Return both outriggers to the outside of the body. Some guests may require help from the instructor. Pull on the mono-ski rather than the guest's arm.**
- **Straight runs. Ski down a gentle slope with a good run-out, practising a good stance and testing balance by lifting up outriggers. Drop elbows downwards and push hands forwards to engage claw on the back of the outriggers.**
- **Turns to one side. On a gentle slope with a good run-out, turn to one side by twisting body from as low to the snow as possible. Emphasise the need for a flat ski. Small amount of edge will be engaged as the ski leaves the fall line. Start with slight turns and gradually increase size of turns. Try to the other side.**
- **Linking turns. On a very easy beginner run, turn to one side. Once the ski is across the fall line, bring balance back to the centre. Start twisting in the other direction from as low to the snow as possible.**
- **Work on steering.**

Common Problems	Cause	Solution
Having trouble with turns to one side	Inclining the ski thus engaging edge	Equal pressure on both outriggers, promoting a flat ski
	Centre of gravity too far back	Shift weight forward. Perform dowel test, adjust set-up accordingly
	Insufficient rotary force	Bring outside shoulder all the way through turn – extend outside outrigger forward
Back of ski washing out, turning too far up hill	Over-rotation	Promote counter-rotation by starting next turn sooner after crossing fall line
Outriggers skipping/bouncing, shoulders being pushed back	Too much brake/claw	Shorten brake bolt

6.2C THREE-TRACK

What:

Three-track skiing is on one leg while using two stand-up outriggers.

Who:

Three-track skiers are people who have had a leg amputated or have no use of one leg.

How:

Turns are made blending all four skiing skills. Movements should primarily come from the skier's leg. The outriggers can be used to assist with these movements.

Equipment:

- **Outriggers should start longer and shorten as the guest improves.**
- **Skiers who have a lower limb amputation can tire easily. A portable chair with you on the snow can give your guest a chance to sit down and rest.**

Method for teaching three-track skiing:

- **Equipment familiarisation. Show how alpine ski works and operation and function of outriggers.**
- **Stationary, introduce the correct stance. Even flex in ankle, knee and hip, almost straight arms with outrigger ski tip in line with front ski binding.**

- **Flat land exercises. Pushing with outriggers. Pushing up and twisting ski. Keep these to a minimum as guest may tire quickly.**
- **Straight runs. Ski down a gentle slope with a good run-out, practising a good stance and testing balance by lifting up outriggers. Drop elbows downwards and push hands forwards to engage claw on the back of the outriggers.**
- **Turns to one side. Start by turning in the direction of the big toe. On a gentle slope with a good run-out, turn to one side by twisting leg in a smooth motion. Emphasise the need for a flat ski. Small amount of edge will be engaged as the ski leaves the fall line. Start with slight turns and gradually increase size of turns. Try to the other side.**
- **Linking turns. On a very easy beginner run, turn to one side. Once the ski is across the fall line, bring balance back to the centre, feeling for a flat ski. Start twisting leg in the other direction.**
- **Work on steering.**

Common Problems	Cause	Solution
Stance too far forward	Outriggers are too short	Lengthen outriggers
	Anxiety	Move to easier terrain. Increase outrigger brake
Stance disrupted when moved to steeper terrain – usually inside shoulder is 'bucked' and pulled back	Outriggers too long	Shorten outriggers as you move to steeper terrain. Aim to use the ski as much as possible, rather than the outrigger

6.2D FOUR-TRACK

What:

Four-track skiing is on two legs while using two stand-up outriggers for support.

Who:

Four-track skiers are people who have a limited or altered use of their legs. This may include people with incomplete spinal cord injuries, hemiplegia, cerebral palsy, amputations but are using prosthetic legs.

How:

Turns are made by blending all four skiing skills. As it is not always possible for a four-track skier to make the ideal skiing movements, moving different parts of the body should be encouraged and experimented with to achieve the desired skiing outcome. The outriggers can be used to assist with these movements.

Equipment:

- **Outriggers should start longer and shorten as the guest improves.**
- **Four-track skiers can tire easily. A portable chair with you on the snow can give your guest a chance to sit down and rest.**
- **A Snow Slider is a walking frame on skis. It can provide support to a skier on easier terrain. The Snow Slider is rigid so can tip over on steeper terrain. The Snow Slider should always be tethered by the instructor.**

Method for teaching four-track skiing:

- **Equipment familiarisation. Show how alpine ski works and operation and function of outriggers.**
- **Stationary, introduce the correct stance. Even flex in ankles, knees and hips, almost straight arms with outrigger ski tip in line with front ski binding.**
- **Flat land exercises. Pushing with outriggers. Pushing up and twisting ski. Keep these to a minimum as guest may tire quickly.**
- **Straight runs. Ski down a gentle slope with a good run-out, practicing a good stance and testing balance by lifting up outriggers. Drop elbows downwards and push hands forwards to engage claw on the back of the outriggers.**
- **Turns to one side. On a gentle slope with a good run-out, turn to one side by twisting legs in a smooth motion. If guest doesn't have ability to twist legs, move up the body until you find a body movement that makes the skis turn. Twisting the outriggers in the direction of the turn can help to get this movement started.**
- **Linking turns. On a very easy beginner run, turn to one side. Once the skis are across the fall line, bring balance back to the centre. Outriggers may be helpful for maintaining balance. Start twisting skis in opposite direction using most effective part of body.**
- **Work on steering.**

Common Problems	Cause	Solution
Unable to turn	Insufficient turning force	Use another part of the body. Use outriggers to create friction turn

6.2E VISION IMPAIRMENTS

What:

Skiing and snowboarding with a vision impairment involves riding with a guide who gives the skier/rider directions.

Who:

Less than 10% of people with a vision impairment have no light perception (completely blind). Skiers and snowboarders may have peripheral vision, tunnel vision, blurred vision or any other combination.

How:

A guide gives the skier or rider with a vision impairment information about the changing terrain and directions about when, where and for how long to turn. These directions should encourage progressive, round turns. Many skiers and riders with a vision impairment still have some level of vision. The guide should wear coloured clothing that allows the skier or rider to follow them.

Equipment:

- **High visibility vests may allow your guest to see you more easily. Check with your guest for which colour is easiest for them to see. This may sometimes mean dark, contrasting colours.**
- **Bamboo or SPM poles are useful for instructor and guest to ski side by side, have physical contact, but still allow for some space.**
- **Ski poles can be used to create a horse and cart set-up.**
- **A Sno-Wing can be used with a snowboarder to give the instructor some control over the rider, while maintaining the feeling of independence.**

Method for teaching people with vision impairments:

- **The progression for teaching a guest with a vision impairment is the same as an able bodied guest. Analogies, feelings, touching (with guest's permission) and tactile hand movements will be very useful in place of demonstrations.**
- **Aim for a round turn shape. "Left/Right" commands result in Z-shaped turns. Practice and have in your bag of tricks different commands that promote a good rhythm and turn shape. Check with the guest for a preferred guiding method. Counting can be effective. For example, 'turn, 2, 3, 4...turn, 2, 3, 4'.**
- **Work with the guest to establish a reference position to aid navigation, such as a clock face or degrees on a compass.**
- **Experiment with guiding from the front, the side and behind your guest. There are many pros and cons for each.**
- **Keep language simple. Using 'and' as a precursor to the next turn. For example, 'turn…and... turn…and... turn'.**

6.2F COGNITIVE DISABILITIES

What:

Teaching someone with a cognitive disability to ski or snowboard can be approached like any other lesson but in some cases learning may take longer than usual.

Who:

People with cognitive disabilities may have full use of their body but may have difficulty understanding and processing instructions given to them. These disabilities may include autism, Down's syndrome, acquired brain injuries and learning difficulties.

How:

Teaching someone with a cognitive disability will often require patience and imagination. Equipment can also be used to develop muscle memory and aid balance.

Equipment:

- **Ski bra/tip clamps are attached to the tips of the skis to keep them together, making it easier to create a snowplough. Guests must always ski forwards when using a ski bra.**
- **A spacer bar, attached between the boot heels and rear binding, when used in conjunction with a ski bra will keep the skis in a snowplough position.**
- **Tethers can be attached to the outside of the ski bra or underneath the boots to allow the instructor to control the guest's speed and turn shape.**
- **Bamboo or SPM poles are useful for instructor and guest to ski side by side, have physical contact, but still allow for some space.**
- **A Sno-Wing can be used with a snowboarder to give the instructor some control over the rider, while maintaining the feeling of independence.**

Method for teaching people with cognitive disabilities:

- **The progression for teaching a guest with a cognitive disability is the same as other ski and snowboard lessons.**
- **More patience is required to find the approach that works best for your guest, and repeating it multiple times once you've found the best approach.**
- **Use your imagination to create a story, analogy or theatrical move for each skill that needs developing.**
- **If your guest has a parent, carer or partner available, find out from them what will help your guest communicate and learn.**
- **Some guests with cognitive disabilities may not understand all the concepts of danger or cause and effect. Repetition and focus on safety is very important.**

6.2G ADAPTIVE SNOWBOARD

What:

Teaching someone with a disability to snowboard can be approached like any other snowboarding lesson, but in some cases will take longer than usual or different equipment may be necessary.

Who:

Anyone who has the ability to stand up has the opportunity to learn to snowboard. People with physical disabilities such as amputations, incomplete paraplegia, hemiplegia and acquired brain injuries are examples of people who may learn to snowboard.

How:

Depending on your guest's ability, teaching a person with a disability to snowboard may follow the same progression as a usual snowboard lesson or may require adaptations to the progression or equipment.

Equipment:

- **A Sno-Wing can be used with a snowboarder to give the instructor some control over the rider, while maintaining the feeling of independence.**
- **Poles or outriggers can be used in place of a leg for a guest with a lower limb amputation.**
- **Snowboarders who have a lower limb amputation can tire easily. A portable chair with you on the snow can give your guest a chance to sit down and rest.**
- **Amputees require a small stick or wedge under the heel of their boot to 'cant' them forward in the binding. This can be slightly rotated to also cant the knee inwards if required. This can aid in balance and edging. NOTE: It does not apply to all, but should be tested by all.**
- **Bindings, stance angle and leg design all play an integral role and it's important the new adaptive rider understand that the journey of learning is heavily dictated by the journey of adjusting and improving equipment.**

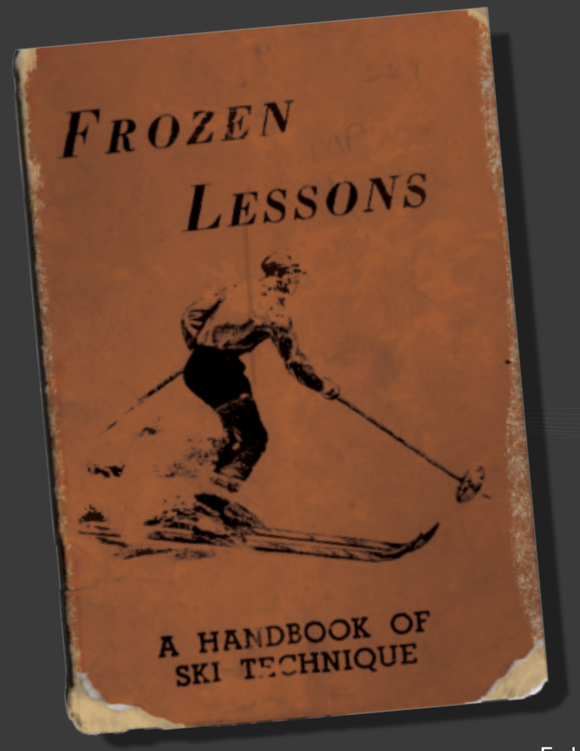
Method for teaching adaptive snowboard:

- **Start by following the usual snowboard progression.**
- **If your guest requires more support or assistance add equipment, such as a Sno-Wing, as appropriate.**
- **Promote progressive movements to create turns.**
- **The Sno-Wing can be used in multiple ways:**
- **Control speed by holding onto the back of the Sno-Wing and sideslipping behind the rider.**
- **Control speed by holding onto the front of the Sno-Wing and blocking the descent.**
- **Control direction by gently turning the Sno-Wing in the desired direction.**
- **Control edge and direction by pushing or pulling on the centre of the Sno-Wing to adjust the rider's hip position.**
- **Some guests with limited movement or reach may not be able to do up or undo their bindings so assistance (ski pole or simply a hand tow) may be needed in lift lines.**
- **Amputees need to stop and dry off their stump as sweat and moisture build up and loosen the connection.**
- **Helping guest in lift line will conserve their energy.**

Common Problems	Cause	Solution
Instability/balance issue in stance	Weakness in one side of body	Sno-Wing can provide stability with lateral or fore/aft support
Inability to rotate trunk	Lack of co-ordination	Sno-wing can initiate rotary movements
	Inflexibility due to injury	Sno-wing can initiate rotary movements
Inability to move heel side to toe side	Insufficient coordination or balance	Sno-wing can initiate weight transfer to heel or toe

Common problems NB: If the solution for these problems can be achieved without the use of the Sno-Wing, use the solution that is most effective and requires the least amount of equipment.

GENERAL KNOWLEDGE



Early Australian teaching manual

About this chapter

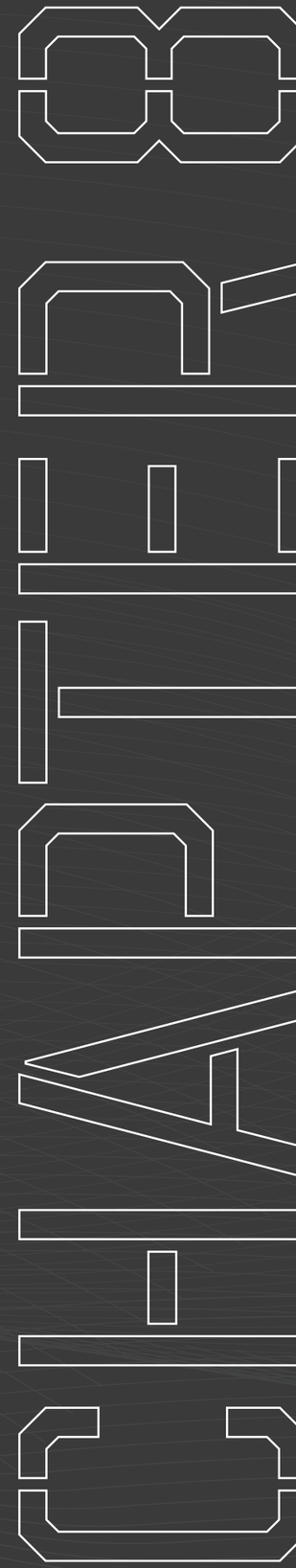
For a guest's experience to truly become a memorable one, instructors often need to go a step further than just creating a professional learning experience.

During and after the lesson you will need to spend some valuable time telling guests about the alpine environment they are visiting. Not everyone will be interested in the same information, but by using your skills of questioning you will find that all people visiting the snowfields show some interest in some area. That interest only needs a little bit of fuelling to help add to a more fulfilling holiday experience.

The challenge for you as the instructor is that you need to have knowledge across many areas. To assist with this, the next three sections cover a variety of topics that you can use to help enhance the guest's experience.

- History
- Equipment and Maintenance
- Our Environment

These sections provide general information about your profession that you can use to help create interesting conversations with your guests. To find out more it is advisable to read other materials (some options are included in the appendix) and ask people around you who have a vast knowledge and experience in these areas.



CHAPTER EIGHT: General Knowledge

SECTION ONE:

HISTORY

8.1.1 A BRIEF HISTORY OF SKIING

Skiing in a rudimentary form began many centuries ago. From Scandinavia through to China, history and folklore recorded many instances involving the use of skis as a means of cross-country transport during snow-covered winter periods.

Skiing as we know it, as a recreational and racing sport, has only been around for 130 years. The Hotting skis dug out of a peat bog in Sweden and other ancient skis found in Finland date back to before 2000 BC.

The word 'ski' is the Norwegian name for snowshoe. However, in 1909 it was written that the word 'ski' originated from a Germanic and Latin word implying splitting wood into the early ski shape.

Prehistoric skis are divided into three specific groups:

- **The northern arctic type - wide and short with straps attached through vertical holes in the tops of the skis and the ski base was covered in hide. This ski is still used in Siberia.**
- **The southern type - long and turned up on the top resembling the skis of the 1930's.**
- **The central Nordic type - one ski was longer and grooved to allow a gliding movement, the other ski was short and the base covered in fur for traction. The method was to push off the short ski to guide forward on to the longer ski.**

We have the Norwegians to thank for the first basic beginnings of ski instruction. The first ski instruction guide was issued to Norwegian soldiers in 1765.

The 1800's

By the early 1800's, skiing was seen in North America where isolated pockets of Norwegian immigrants were found. Canadian and American skiing was years behind Europe. Techniques adapted to rolling hills and absence of heel bindings hindered progress in North America.

However, on the other side of the world, skiing, initially regarded as a mode of transport, became recognised and organised in 1861 by Ski Club Kiandra, Australia - through its membership of Norwegian and Australian miners.

In 1861 in Norway, Sondra Norheim from the Telemark District was the first ski designer to use innovations such as:

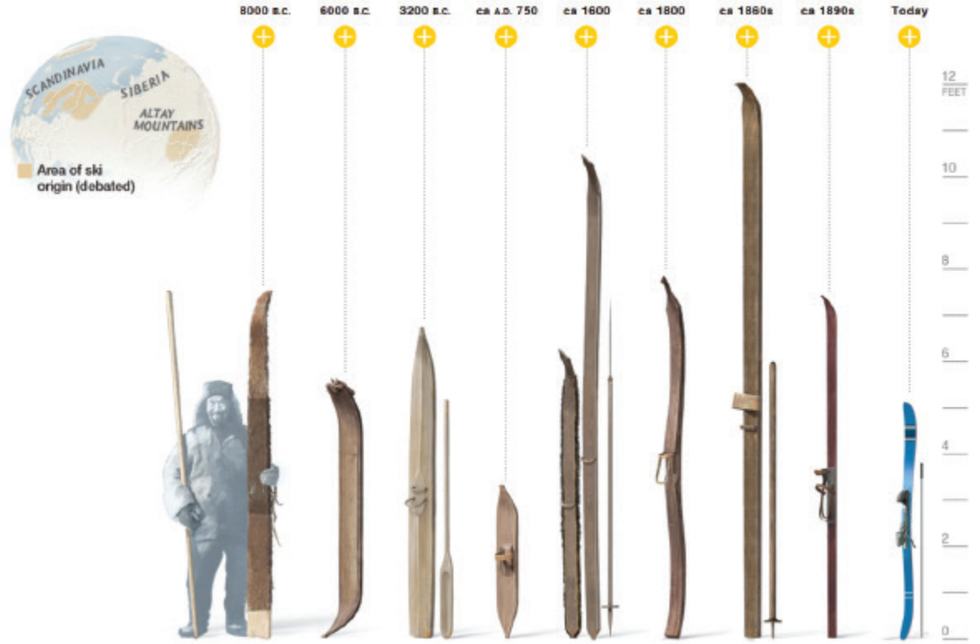
- **shorter length skis from 12 foot down to 8 foot;**
- **waisted skis, narrower under foot, allowing the first carved radius to be performed;**
- **anchored heels with the strap made from twisted willow twigs (allowing greater movement). Skiing then spread through Europe and North America from the 1900's. Norheim further developed the telemark with a parallel stop turn that progressed to a parallel swing, the 'Christiana', named for the district now called Oslo in Norway.**

In 1889, a young Austrian, Matheius Zdarsky, worked on the technology of skis and bindings better suited to alpine terrain. As a result, skis became even shorter and the groove in the base disappeared. A method was also found to make the binding laterally rigid, yet still allow the forward release. So finally, the running ski became a turning ski. A long pole was also used to aid in balance and turning.

In contrast with the Norwegian style, Zdarsky was after a technique that would enable anyone to learn to ski quickly and safely. This technique was based on slow and safe skiing in a stem position. 1896 saw Zdarsky write and publish in detail the first illustrated ski manual, which was to provide the basis of all alpine ski techniques used today. As well as contributing the snowplough and stem turn to the progression, Zdarsky indirectly influenced Colonel Bilgeri. Bilgeri's technique was similar to Zdarsky's but used two sticks instead of one and used skis with a groove. For his efforts towards the sport of skiing and its development Zdarsky was acknowledged as the 'Father of Alpine Skiing'.

The 1900's

From the early 1900's the sport became a winter recreational holiday. Ski schools became part of the scene, with followers of the two techniques, Nordic and alpine, claiming that each respective style was the better method of skiing.



In 1904, at age 14, Hannes Schneider was taught to ski by Victor Sohn in the Arlberg, Austria. Being so young and with time to practice, Schneider improved and was asked to teach in 1907. He invented the 'Stem Christiana' in 1909. In 1912 he developed a class system with three stages: beginner, intermediate and advanced, thus systemising the sport of skiing so it could be taught effectively. Schneider taught Austrian troops en masse and, while doing so, discovered the need for supervision of instructors and ski classes. Thus was born the 'ski school director'.

By 1920, Schneider, with his emphasis on 'up' and 'down' movements, made famous the 'Arlberg Technique', schussing in the Arlberg crouch, the wide track stance, stem turns for ski touring, stem christies and pulled christies for closer linked turns in the fall-line.

Miracle of the Snow Shoe written by Arnold Frank around 1912, had an enormous impact on the world as it included time-lapse photographs that provided previously unavailable information. Good action shots, telephoto shots, front lighting and informative glimpses of experts at work inspired thousands to acquire the skills of skiing.

During the 1920's, Sir Arnold Lunn revolutionised skiing on a competitive basis. His slalom racing was adapted into the Olympic program. 1924 saw the first Winter Olympics in Chamonix, France where only Nordic events were seen. It was not until 1936 that alpine events were included. With the approach of the 1930's, the first Hahnenkahm race was staged in Kitzbuehel, Austria - which to this day is still considered as the world's longest and hardest ski race.

From the 1920's to the 1930's there was a standstill in the evolution of skiing technique. Turns were made by a stem and weight change.

In the early 1930's, Austria's Rudolph Lettener was tired of having his all-wood skis torn to splinters by exposed rocks so he outfitted his skis with metal edges. Not only were they a success but new edges also demanded a change in technique. This development led to more angulation of the body and a deeper forward lean, eliminating the low crouch position. Edges also provided increased efficiency in narrow track gliding and turning power, thereby enabling faster, tighter and safer skiing.

In 1933, Adolf Attenhofer developed the first complete, all-metal binding. This enabled him to securely hold the heel in place, providing more dynamic turning and better edge control on hard packed slopes. In 1936 the French emphasised the learning of parallel turns using a rotation of the upper body through a progression of sideslipping and up hill swings. The beginning of sideslipping and up hill turns joined the progression.

In St Anton in 1939 Hannes Schneider was intercepted by the Gestapo and transferred to Garmisch Germany for processing.

Thomas Mitchell (later becoming an Australian politician) bribed the Gestapo with the cash and Hannes was released; this act saved Hannes Schneider from the Holocaust.

Hannes was transferred to the USA and set up a ski school on the East Coast where he remained for the rest of his life.

There was another lull in the development of skiing technique and skis due to World War II. In the late 1940's the differences between the French, Austrian and Swiss techniques were clearly visible, but the gap between technology and technique narrowed. In the US, Howard Head, marketed his standard aluminum sandwich ski, while in 1946, the Swiss company Muller and Co. invented and developed the P-tex base. 1949 then saw the invention of tenderfoot ankles (made of porous foam rubber) and this was the forerunner of the flow-filled boot of the 1970's.

The early 1950's saw the development of shorter-radius turns. Professor Stefan Kruckenhauser of Austria believed the legs should turn the ski. Both the French and the Swiss were seen to be experimenting but with more sideslipping and less extreme body positions. Turns became faster and more precise and deep snow was no longer out of bounds. With shorter skis, flexible metal cores and plastics, skiing became easy.

In 1951 the first international ski congress (Interski) took place in Zurs, Austria. The congress became the basic means for international discussion and comparison of ski and teaching methods and would take place every four years afterwards. In the next 10 years, technology developed at a rate parallel to new advanced techniques in skiing.

In 1954, Marker developed and introduced the first safety binding. In 1955 Obermeyer designed the first flow-boot from viscous liquid grease. 1957 saw the first aluminum ski poles, made by Scott, and by 1959 Bob Lange began to substitute certain parts of leather boots with fibreglass. This experiment led to the revolutionary Lange competition boot in the early 1960's.

By the mid 60's, boot technology complemented new fibreglass skis and all-plastic buckle boots securely anchored both the ankle and the whole boot.

The result was lightning quick. Comfort was gained by foot-conforming flow materials and injected polyurethane foams, while anti-friction devices made safety bindings more dependable.

Technological innovations evolved to the point where skis and boots simply became an extension of the skier's will. In America, Cliff Taylor and his disciples of the Graduated Length Method (GLM) swore short skis were the way to go.

There was a breakaway from the traditional ski school atmosphere as freestylers, decked out in high-backed boots and high performance skis, took to the air in the early 1970's. Helicopters, aerials, mogul bashing, daffys and flips were becoming common.

The 70's saw further deviation from the traditional concepts of skiing. Monoskiing made its first appearance, ski hang gliders were seen above and helicopters started lifting people to previously inaccessible areas to try their skills on the deep and light powder. Terrain, techniques and advanced parallel manoeuvres brought new words to the ski language: compression turns, jet turns and avalement.

The increase in the number of people skiing put a strain on the ski area capacity. Some gave up the crowds for the more serene atmosphere of Nordic skiing. At the same time, freestyle competitions were being formed. By the end of the 70's, the ski industry concentrated on comfort and improved safety with innovations such as the boot plate and ski brake.

Teaching circles emphasised humanistic approaches.

In the early 1980's, new designs were experimented with and produced. Hub Zemke designed the Hexcel Swallow-Tailed ski, while Hanson designed the similar split tailed ski. Head manufactured the radical side-cut on its line of skis and Fischer followed closely behind with a similar but more refined design. Paragliding with skis appeared and the new extension of surfing came to the forefront- snowboarding.

The shaped ski revolution started around the mid 1990's and nowadays the old straighter skis are rarely seen. A wide variety of shaped skis make learning and skiing in all terrain easier and more fun for all levels. In early 2000, construction radically changed the torsional stiffness of the shaped ski. This improved ski performance allows ski racers to make pure carved turns at a radius that was previously impossible. It has also resulted in greater inclination and need for a definite crossover movement in all higher end skiing.

Most manufacturers are now standardising ski shape; racing disciplines are asking for a predetermined radius, while the average skier is tending more to an all-mountain style ski. The newest revolution, besides advancements in construction, has been the arrival of the 'twin tip ski', enabling skiers to perform and ride with their snowboarding counterparts.

8.1.2 A BRIEF HISTORY OF SKIING IN AUSTRALIA

1861 saw the formation of the first ever organised ski club in the world - by Norwegian and Australian miners in Kiandra, NSW. From this date, skiing progressed at a slow but steady pace. Other clubs were formed later in the period in both NSW and Victorian mountain regions.

The early 1900's saw long treks made by foot or horse so the pioneer skier could walk up and ski down their favourite ski slope. The only on-snow accommodations at that time were the Mt Buffalo Chalet built in 1910 by the Victorian Railways and the Charlotte Pass Chalet. The first rope tow was installed in 1936 at Dingo Dell to service the guests at the Mount Buffalo Chalet. NSW Tourism installed an "L-Bar" (like a T-bar but for one person) for the Charlotte Pass guests soon after.

The arrival of Sasha and Karel Nekvapil in 1950 saw skiing turn for the better. Sasha and Karel started the Mount Buller Ski School and brought a degree of professional instruction to Australian skiing. They were later invited to Charlotte Pass Ski School by Tony Sponar, who also influenced Australian skiing. Here, Sasha coached and instructed early Australian representative ski teams for seven years. Later, Karel formed the Thredbo Ski Racing Club and started the Sasha's Cup Trophy for children. Between them they instructed and coached a group of juniors who were then ready for serious ski race training.

The first chairlift to be installed in Australia was in winter 1957 at Falls Creek. The structure was a single chair with wooden towers that started at the base of the existing Gully Chair and finished at the top of the Village T-bar. The lift was built by Bob Hymans who lived and ran the Four Seasons Lodge up until his passing in 2007. Thredbo quickly followed during the summer of 1957-8 with a single chair. The lift rose from an altitude of 4,480 feet to 5,920 feet where Kareela restaurant now stands. In 1962 it was upgraded to a double chair and extended to the top of Crackenback. It was replaced in 1989.

Australia now has five large ski resorts and five smaller lifted ones with a combined visitation of around 2.3 million skiers per year.

8.1.3 A BRIEF HISTORY OF THE APSI

The first Australian Ski Instructors Association was founded in August 1974. The association was known as the Australian Ski Instructors Association (ASIA). This was formed to improve the working conditions, in general, for its members. There were 25 founding members who

appointed a committee of eight to represent them. They were: President, Graham Bookallil; Secretary, Peter Clare; Treasurer, Victor Dalziel; Publicity, Officer Rod Dunning; and Committee Members, Geoff Meredith, Bill Foster, John McDonald and Jim Rose.

In September 1975, the first Association Certification was held in Perisher Valley. Thirty-five candidates attended the course, of which 14 were successful. It was not until 1977 that Australia produced the first group to hold Full Certification.

These were: George Perry, Nick Dean, Peter Egger, Craig Stewart, John McDonald and Max Parker.

During 1976 the association divided to form NSW and Victorian divisions. The Victorian division, under John Whitehouse, formed the Australian Professional Ski Instructors (APSI) and largely through his efforts, the APSI gained government and importantly, international accreditation for its exams.

The International Ski Instructors Association's (ISIA) recognition of the APSI forced these two factions of ski instructor training to unite. At a meeting held in Albury in 1978, John Whitehouse was elected President and Nick Dean, Vice President. Over the next few years Australians earned examiner status at both junior and senior levels - although courses were still run by Europeans and Americans.

The Australian Ski Areas Association (ASAA) disputed the credibility of the existing association and continued to run training courses in Victoria under the name ASAA Ski Instructors Division (ASAA - SID).

The amalgamation of the APSI and the ASAA was a long drawn out procedure, this process was further disrupted when the office based in Melbourne caught fire in 1984 and many records were destroyed. It was not until 1985 that these two associations merged and Bruce Hawkins was elected as APSI President and Brad Spalding as Vice President. This body was now responsible for training and accrediting all Australian instructors.

After the turmoil of the previous years, the APSI was under new leadership and totally focused on the training and accreditation of Australian instructors by Australian trainers. Support and confidence in the system equaled greater support and funding from the ASAA. Within three years some of the larger schools had Australian directors. The growth in the ski industry saw approximately the same number of imported instructors in the system as the new Aussies filling the gaps. The APSI still called on talented trainers from overseas when necessary.

The ASAA have contributed to the further development of the association with the funding of a Training Coordinator role. Don McInnes assumed the role of the first ever Training Coordinator, travelling to all resorts to streamline the training coordination and accreditation of all instructors. The ASAA have expanded their funding to cover the same continuity for the snowboard discipline.

"INTERSKI" has played an important role in the continuing development of the APSI method. These congresses have enabled APSI to share and gather information and to showcase our skills. Our first attendance was at Sesto, Italy 83, then Banff 87, St Anton 91 (first time with a full coordinated team), Japan 95,

Norway 99, Switzerland 03, Korea 07 and Austria 11.
In 1995 APSI was the first organisation from a southern hemisphere country to gain representation and voting status on the Interski board.

The role of the APSI continually evolves to meet the needs of the snowsport industry. This is shown in the changes that have been made since the APSI was founded:

- **The teaching manual had its first major overhaul, something which now happens every four years. The Technical Director, working with the experiences gained from both Interski and the past years, ensures the APSI technical content has evolved to represent a truly Australian method;**
- **Introduction of the "Red Book" through the efforts of Roger Byrnes and his team;**
- **Snowboarding was welcomed into the APSI in 1993 with major input from Geoff Sawyer, Salena Webber and Matt Gilder.**
- **The telemark discipline was welcomed to the APSI in 1994;**
- **In 1995, the ASAA-funded Training Coordinator role was merged with the APSI Technical Director's position, to create the National Training Coordinator position. John Fahey assumed this position followed by Ian Bruce, 1999 and Andrew Rae in 2003. The position also incorporated the Chief of Exams role;**
- **In 1997 the name was changed to "Australian Professional Snowsport Instructors Inc" to reflect the diverse nature of the industry;**
- **In 1998, the ASAA supported position of Snowboard Technical Director was created and filled by Dean Hill for 6 years. Jason Clauscen took on the role in 2004;**
- **In 1999 the NCIS (Nordic instruction) joined with APSI, resulting in all disciplines - Alpine, Snowboard, Telemark and Nordic - being represented by the one organisation;**
- **In 2002, Dave Anderson as President brought the administration of the APSI in-house and established the APSI office in Wodonga with Claire Stanton as the first full-time employee;**
- **In 2004, Andrew Rae was appointed to a full-time position that expanded the role of National Training Coordinator, now being the face of APSI and representing all disciplines of the APSI.**

APSI Honour Roll

Year	President	AASA Training Director	Alpine Technical Director	Snowboard Technical Director/Cheif examiner	Alpine Cheif examiner	Administrator
1976	John Whitehouse					
1977	John Whitehouse					
1978	John Whitehouse		Jorge Dutschke		Jorge Dutschke	
1979	John Whitehouse		Michael Porter		Michael Porter	
1980	John Whitehouse		Michael Porter		Michael Porter	
1981	John Whitehouse		Michael Porter		Michael Porter	
1982	John Whitehouse				Michael Porter	
1983	Henke Tuppe				George Pimoser	
1984						
1985	Bruce Hawkins		Peter Reynolds		George Pimoser	
1986	Bruce Hawkins		Peter Reynolds		George Pimoser	
1987	Bruce Hawkins	Don McInnes	Peter Reynolds		Brad Spalding	
1988	Bruce Hawkins	Don McInnes	Colin Baldock		Brad Spalding	
1989	Bruce Hawkins	Don McInnes	Colin Baldock		Brad Spalding	
1990	Bruce Hawkins	Don McInnes	Tom Peters		Brad Spalding	
1991	Tim Cokrhill	Don McInnes	Tom Peters		Brad Spalding	Les Tokolyi
1992	Tim Cokrhill	Don McInnes	Roger Bynes		John Fahey	Les Tokolyi
1993	Kerry Lee-Dodd	John Fahey	Roger Bynes	Selina Webber	John Fahey	Les Tokolyi
1994	Kerry Lee-Dodd	John Fahey	Roger Bynes	Selina Webber	John Fahey	Les Tokolyi
1995	Kerry Lee-Dodd	John Fahey	John Fahey	Selina Webber	John Fahey	Les Tokolyi
1996	Kerry Lee-Dodd	John Fahey	John Fahey	Selina Webber	John Fahey	Robyn Bowen
1997	Kerry Lee-Dodd	John Fahey	John Fahey	Selina Webber	John Fahey	Robyn Bowen
1998	Kerry Lee-Dodd	John Fahey	John Fahey	Dean Hill	John Fahey	Robyn Bowen
1999	Kerry Lee-Dodd	Ian Bruce	Ian Bruce	Dean Hill	Ian Bruce	Robyn Bowen
2000	Kerry Lee-Dodd	Ian Bruce	Ian Bruce	Dean Hill	Ian Bruce	Robyn Bowen
2001	Dave Anderson	Ian Bruce	Ian Bruce	Dean Hill	Ian Bruce	Robyn Bowen
2002	Dave Anderson	Ian Bruce	Ian Bruce	Dean Hill	Ian Bruce	Claire Stanton
2003	Dave Anderson	Andrew Rae	Ian Bruce	Dean Hill	Andrew Rae	Claire Stanton
2004	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Andrew Rae	Claire Stanton
2005	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Andrew Rae	Claire Stanton
2006	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Andrew Rae	Claire Stanton
2007	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Richard Jameson	Claire Stanton
2008	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Richard Jameson	Claire Stanton
2009	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Richard Jameson	
2010	Tony Smyth	Andrew Rae	Andrew Rae	Jason Clauscen	Richard Jameson	Donna Poulos
2011	Tony Smyth	Andrew Rae	Richard Jameson	Jason Clauscen	Richard Jameson	Donna Poulos
2012	Mark Dixon	Andrew Rae	Richard Jameson	Jason Clauscen	Richard Jameson	Alexia Colville
2013	Mark Dixon	Andrew Rae	Richard Jameson	Jason Clauscen	Richard Jameson	Alexia Colville
2014	Mark Dixon	Andrew Rae	Richard Jameson	TBA	Richard Jameson	Alexia Colville

8.1.3
SECTION 1 History
CHAPTER 8 General Knowledge

CHAPTER EIGHT: General Knowledge

SECTION TWO:

EQUIPMENT AND MAINTENANCE

8.2.1 TYPES OF SKIS

Perhaps the most intriguing aspect of the modern ski is the continued reduction in length. Up to 15 years ago, 210cm and 205cm skis were not uncommon. Nowadays the same people are on skis ranging from 160cm to 190cm.

CARVE SKI

64-78mm underfoot

The carve ski is one that is comfortable in a short or long turn on the groomed runs. Taking them off the groomer, skiers will need to be more skilled as the ski is typically narrower underfoot than other skis and gives the feeling of sinking in the snow.

ALL-MOUNTAIN SKI

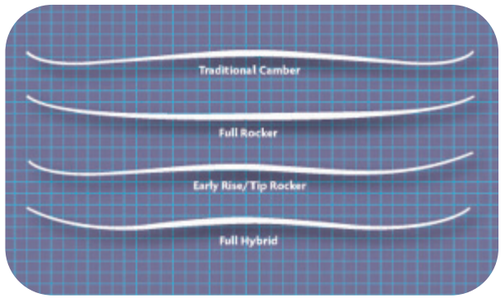
78-95mm underfoot

The proportions of all mountain skis are similar to carve skis but wider all over. This allows the ski to not only be good on groomed terrain but also suitable for powder, crud and off-piste skiing. All mountain skis are a very versatile choice for both guests and instructors looking to have one ski that can do it all.

POWDER SKI

95 –>130mm underfoot

In the past a powder ski was a wide plank with no side-cut. Nowadays, the powder ski has side-cut and comes in various widths, from a ski that can still be skied on the groomed, to skis with more width that are mostly suited for powder. The most recent change to powder skis is 'rocker' in the tip and tail. This allows the ski to float better in soft snow and decreases the effort at the end of the turn. Previously the skier had to release the camber in the ski (by retracting/absorbing) to allow the ski's tip to float back to the surface. These skis are already de-cambered which creates an easier turn in the powder.



Note: Many ski companies are introducing the 'rocker' technology into a wide cross section of their products.

RACE SKI

The specifications and side-cut of a race ski is governed by FIS regulations, which tend to change as quickly as technology advances. At the time of printing, a GS ski has a radius of 35 metres for men and 30 for women, while SL skis are governed by length (155-165cm). You can obtain race skis that do not adhere to these measurements if you wish to ski on them recreationally and not in FIS sanctioned events.

A race ski tends to be less versatile in off-piste conditions because it demands a more accurate technique to ski them and is better suited to high-speed turns on the groomed and firm conditions of a racecourse.

TWIN-TIP SKI

This is a ski with a good side-cut but curled up at the front and back. Although it is suitable in all terrain, it is most suited for terrain parks and the halfpipe. Twin tips tend to have a softer tip and tail that is designed to handle the sudden changes in terrain when skiing in the pipe. This also makes it a fun ski for powder. Ski instructors can get a lot of use out of higher quality twin tip skis as they are versatile enough for all the rigors of the job, including giving teacher assistance when skiing backwards. It should be noted that the guest may notice a difference while watching your demonstrations if using a twin tip, especially if the ski is centre mounted.

WOMEN SPECIFIC SKI

The market nowadays is offering a wide range of skis with attractive graphics specifically designed for women. These types of skis are usually made from lighter materials, often slightly softer flexing and the bindings tend to be mounted further forward to allow easier turning and more effortless initiation of the turn.

AT OR BIG MOUNTAIN SKIS

There are quite a few models of the powder ski that are also a twin tip. They are designed for free ride skiers and the moves that they produce on extreme big mountain lines. These skis are a high performance ski with good versatility and control when skiing at high speeds in tough terrain. 'Rocker' technology has also been incorporated in big mountain skis as it aids the landing from cliff drops by reducing the rebound reaction caused by de-cambering the ski. These skis also tend to have a side cut similar to a 'GS' style of ski allowing for high speed arcing on firmer powder or crud-like conditions.

SKI BLADES

Ski blades are about 90cm in length and also possess a good side-cut. They can be used for all sorts of reasons: to teach lower end athletic students to parallel turn in a short time, carving exercises, skiing in the moguls, for people who are talented at roller blading, learning short turns, learning jumps, fun games with adults and children, and much more.

There are many other ways to enjoy the alpine environment ranging from snow-scooters to skwals. Just like participating in another snowsports discipline they are simply another way to slide on snow. Try as many as you can, they all enhance the alpine experience.

8.2.2 TUNING SKIS

From the first time skier to a world cup racer, everyone will find it easier to ski to their potential if their skis are kept in good condition. Here are some ideas and guidelines to keep your skis in good shape to make skiing easier and safer.

It is highly recommended that you learn to tune your own equipment and maintain it. However, if you have limited experience at tuning your skis, be careful, as it is easy to either damage your skis or suffer an injury. Unless you have someone at hand to teach you how to tune, it is suggested you leave this to the professionals.

Reasons for tuning your equipment include: enhances performance, makes carving easier, helps with gliding on flat trails, extends the ski life, and a sharper tool is a safer tool.

HOW OFTEN SHOULD I TUNE?

This depends on the snow. If you are skiing in powder regularly then it won't need to be done as frequently. If the snow is hard pack and icy then you may need to do it 1-3 times per week. Australian snow can be some of the most coarse in the world and dirty via dust storms, so waxing regularly is very important.

The best way to tell if you need a tune is by the performance of your skis. If the skis are slipping and not gripping as well as they used to, then you know it's time for a tune. You can also tell if the skis need a tune if they don't seem to be running straight or won't stay flat when in a straight run on a t-bar. Probably the best test is if you have forgotten when you last had a tune, then it is time to get one.

Steps for tuning

All ski work should be done in a vice so that the ski does not move. Movement can affect the end result and increases the chance of causing an injury while tuning. The following is a basic guide to help you keep your equipment in good condition as well as troubleshoot tuning issues with your guest's skis.

- **Base preparation**
- **Setting the edges**
- **Waxing**

BASE PREPARATION

Repairing the bases

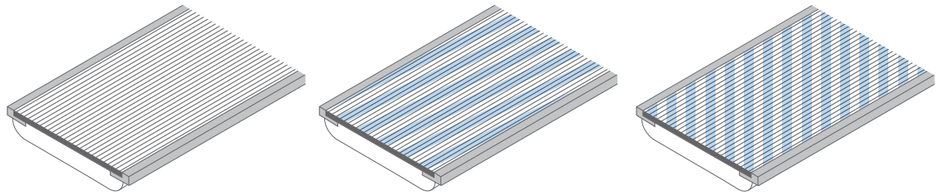
Clean the ski and check the ski base for deep gouges. Fill these gouges with p-tex (light using matches or a lighter until it burns by itself). Hold p-tex candle low and close to the base so that the flame burns blue. Drip molten p-tex into holes to fill them. Once holes are filled and p-tex has cooled, scrape excess off with a sharp metal scraper or a panzer file.

Note: to sharpen the metal scraper, lay a file flat on the bench and push the scraper toward the tail of the file. Repeat until the scraper is sharp.

Grinding skis

If the ski base is badly damaged, base high or edge high, you may need to start your tune with a 'base grind'. It is almost like starting all over again as it gives you a flat working surface. By using a true bar and holding the ski up to some light, you will be able to tell what work is needed. The diagram shows three very different ski bases:

- **Edge high or concave is where the edges are higher than the base, causing the skis to run straight and making it more difficult to twist/turn the ski as it will get stuck on the edges.**
- **Base high or convex will cause the skis to wander and make it difficult to grip with the edges.**



Linear Structure **Cross Structure** **Broken Structure**

Structure

Base structure refers to the small lines or grooves in the base that help to channel water away from the ski to stop suction. Stone grinding is the most accurate way of achieving a good structure. In general, the wetter the snow the coarser the structure needs to be. This does not need to be done for every tune but does help improve the overall speed of the ski in different snow conditions.

SETTING THE EDGES

When setting the edges hold the ski brakes back with elastic bands.

De-burr the edges

Use a coarse diamond stone to help remove hardened steel and burrs after hitting rocks. This is so you can get the ski's edge smooth and ready for sharpening without damaging your file and to gain a better finish.

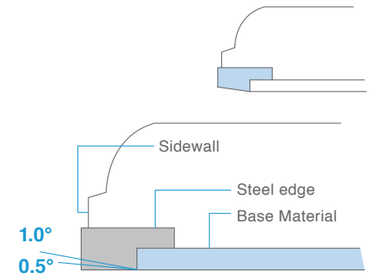
Base edge bevel

If your base edge is perfectly flat edge-to-edge, the ski will be hard to steer and feel very catchy.

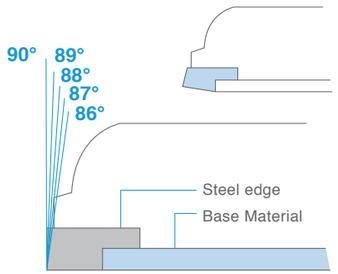
By placing a true bar on the base edge you can see the approximate degree of bevel you have. Use a file with a guide to angle the base edge at 0.5 degree to 1 degree; this is good for general teaching. Place the file flat on the base and pull toward you with light downward pressure. Using base tape will protect the base from unwanted scratches and metal shaving getting into the structure.

Side wall removal

You will need to remove the hard sidewall material just above the side edge, so that when side filing your file does not become clogged and hard to use. To do this you can use a special sidewall removing tool, a rasp, the end of a file or a sharp metal scraper. Cut the sidewall back enough to allow your side edge file to cut cleanly, but not so much that you weaken the support of the edge.



Base Edge Level usually 0.5°–1.0°



Side Edge Bevel

Side edge filing

For skis to grip on hard snow the edges must be sharp. We achieve this by filing the side edge of the ski. The more acute the edge angle the easier it will be to cut into icy snow, although this can cause the edge to damage easily. If you have a 1-degree base bevel you will need to file the side edge at 1 degree or more. A typical tune used by ski instructors would be 1 degree on the base and 2 degrees on the side.

Using a file guide, attach the file and pull with smooth overlapping strokes until the edge becomes clean and sharp. Be sure to use new/sharp files to avoid placing excess pressure on the file. Clean the file and edge you are working often during this process (use a file card to clean the file and paintbrush or similar to clean the ski's edge from filings). Turn the ski around and repeat on its other edge (it is OK to file the ski tail to tip and is far more important that you are pulling the file towards you).

De-tuning and polishing

Your edge should now be razor sharp, however, filing the edge leaves a microscopic burr which needs to be taken off. You can use a soft stone, ceramic stone or diamond stone to rub it along the base and side edge once or twice. This will keep the edge sharp but not grabby or hooky. After stone grinding, check the tip and tail of your skis and with a stone or diamond file round the edges slightly where they do not touch the snow. Further de-tuning with a soft stone can be done to the tip and tail and depends on personal preference and the type of skiing you are doing.

WAXING

If the base of your ski is dirty, clean it with a base cleaner or you can use a hot wax and scrape. By scraping the wax off while hot, the dirt becomes trapped in the wax and cleans the base. The hot wax method will keep your bases saturated with wax as opposed to removing the wax with a cleaner.

- **To wax the ski, lay the ski base up and hold the ski brakes back with elastic bands.**
- **Heat the iron to approximately 120 degrees (temperature is dependant on the type of wax being used so check the recommendations from the manufacturer) and drip wax onto the base. If the wax starts to smoke the iron is too hot.**

- **Iron wax in by constantly moving the iron along the ski base, tip to tail. About 8-10 secs per length of the ski. Repeat 3 times.**

Leave the skis this way to store and transport them between seasons. Using fluorinated wax can help repel dirt and help with gliding. Harder/colder waxes last longer but will be slightly slower when the temperature is warm. Softer/warmer waxes wear off faster and will be extremely slow when snow is fresh and cold. Most modern waxes have an iron on temperature on the packaging (the colder the wax the hotter the iron). Be very careful not to overheat the base as it can cause serious damage to the base material.

Scraping/Brushing

Scrape the wax off the base and side edges with a plastic scraper tip to tail. To sharpen the scraper, push it along a file (preferably a panzer file secured to the bench). The wax in the base pores is what protects and makes your ski go fast. Using a brass or steel brush, brush the wax out of the structured grooves. This will improve speed. The better you scrape the less you need to brush.

After a little practice, tuning will become easier and faster and you will notice a huge difference in your skiing.
To keep your skis maintained they should be touched-up most times you ski on them. A touch-up involves diamond stoning the edges and waxing the skis as mentioned above.

TROUBLESHOOTING PROBLEMS WITH SKI TUNING

Bases not flat:

After stone grinding it's imperative that you check the bases to make sure they are flat. Often the skis will come back concave in some areas (in particular the tip and tail). This will make the ski very edgy in these spots and hard to twist. Depending on where the areas of concaveness are, the ski might feel twitchy or nervous when turning.

Solution: The ultimate solution is to continue working with your ski technician to re-grind the ski until they can get it dead flat. Other temporary solutions are to apply slightly more base bevel in the spots that make the skis too grippy.

8.2.2
SECTION 2 Equipment and Maintenance
CHAPTER 8 General Knowledge

Structure in the edge:

Sometimes this is a telltail sign that the ski does not have enough base bevel. Look closely at the base edge of the ski after a base grind to determine whether the structure on the p-tex has created consistent little nicks in the metal base edge. This structure can catch like a serrated knife in certain snow conditions making the skis hard to twist and blend rotary with edging.

Solution: Apply more base bevel until structure is removed from the edge. Sometimes polishing the edge with a diamond stone is enough to remove the structure.

Structure too deep/sharp:

After stone grinding, if the structure is too deep (generally used for spring conditions), the ski can be hard to twist, steer and carve in some snow conditions. This may also be found in certain types of aggressive linear patterns and structures with sharp peaks to them.

Solution: Fine (not too deep) structures in general, serve a ski instructor's demonstration skiing better. They enable the skier to blend all skills together in all performances. You may give up some speed in slushy spring snow conditions but the benefit you gain far outweighs this downside. You can also ask your ski technician to place a topping pass (sometimes called a finishing pass) on your skis to knock down the peaks of the structure.

Inconsistent base bevel:

If too little base bevel the ski will lock on edge and be hard to do any other turn than a pure carved turn. Too much base bevel will make the ski skid easily and difficult to get the edges to grip. Sometimes base bevel can be inconsistent and change along the length of the ski making various parts of the ski react (as above) in different spots.

Solution: Spot check the base bevel carefully in locations along the ski with a true bar or bevel reader. Use long/light strokes with your base bevel guide along the entire ski to see where you are pulling base edge material and where you are not. Be careful not to file too hard, you can't glue this material back on. When too much base bevel is gained the ski will have to be ground flat again.

Other ways to maintain your equipment:

- Turn down your release setting at the end of the season to help maintain the life of binding springs
- Switch skis from left to right foot now and then to distribute wear evenly, unless the skis are specifically designed for each foot
- Wipe your skis down religiously after every use especially around the bindings. This will help prevent rusting along the edges of the skis
- Seal the bases and edges of your skis with storage wax at the end of every season to keep them from oxidizing and rusting

TUNING KITS

Start with a basic kit and add to it slowly. It takes time and money to build up a really good kit.

Basic kit

- 2nd cut file 20cm
- Diamond stone 200grit
- 2 degree, side edge file guide and clamp
- P-tex candles and lighter
- Large rubber bands (to hold ski brakes up)
- Ski wax (1 block of cold and 1 warm)
- Iron (a specific waxing iron is key to avoid damage to your bases)
- Plastic and metal scraper
- Basic brush

Upon winning the lottery

- Different types of files including a mill bastard file and panzer file)
- Gummy or soft stone
- Diamond stones at different grades
- File guides at different angles (1-4 degrees)
- Base bevel file guide (0.5-1 degree)
- Sidewall remover
- File card to remove filings from file
- Nylon, horse hair, steel and brass brushes
- True bar
- Wax selection for different temperatures and racing
- Ski vices
- Ski straps (to keep edges and bases from rubbing)
- Structure tool
- Your own ski technician

8.2.3 SKI BOOTS AND GETTING THEM RIGHT

Ski boots are one of the most important pieces of equipment a skier can own they can provide good balance, feel and connection with the snow. If you compare a skier to that of a high performance racing car, the skis would be the wheels, our body would be the chassis/body of the car and the boots would be the suspension and steering components which connect the others together. It's for this reason that you need a well-fitting ski boot that is not only comfortable, but set up well for you so that you're able to get the best possible performance and ride down the mountain.

It's for this reason that ski boots should be the first piece of gear you recommend for guests to buy when purchasing equipment. It's imperative you guide them towards a good boot fitter that will offer them many varieties and source the best boot for their foot. Even if this means a boot fitter that will send them to another shop that has the right boot for them, rather than just making a sale.

There are many aspects to ski boots that make them "right" for an individual and some of the following areas should be considered when purchasing or setting up a boot for the individual.

- Volume/Fit (width)
- Stiffness
- Footbeds
- Forward lean
- Ramp angle
- Cuff alignment
- Lateral canting

Volume/Fit

As mentioned previously, a good boot fitter must be the first port of call in this process. All boots have different volumes and shapes internally, just like all feet are slightly different from person to person. An experienced boot fitter can look at a person's foot and determine which brand and internal last will be best suited to their foot shape and size. In general, skiers are looking for the tightest fitting ski boot that doesn't hurt or alter the shape of the natural foot shape.

After market or foam injected liners can also be a good way to improve fit and performance. Again, it's important to affiliate yourself with an experienced boot fitter to perform this type of work.

Stiffness

Most boot manufacturers produce a range of stiffnesses in regards to how the ski boot bends forwards with the ankle joint. Ideally, the front of the boot's cuff should fit close to the shin and get progressively stiffer as the boot is flexed. "The cuff should never feel like a hard wall that your shin runs into when you flex your ankle" (Lemaster, 2010). This would be an indication of the boot being too stiff. If the boot "bites" between the ankle area and foot when flexing the boot might be too soft.

When trying boots on you should keep in mind that ski boots are stiffer outside in the cold than they are in a warm ski shop. To find the correct forward flex some factors to consider are personal body type, the type of skiing and a person's skiing ability.

Personal body type: In general the bigger the skier, the stiffer the boot. At times it may not be possible to get the exact flex in the boot that fits your body type. A good boot fitter will be able to stiffen or soften a boot by cutting the shell or adding rivets to stiffen.

Type of skiing: The type of terrain the individual skis can sometimes determine how stiff they would want their boot to be. For example, skiers wanting to cruise, ski softer snow conditions or ski big moguls, a softer forward flex might work better. Whereas someone skiing a lot on firm hard snow, racing and performance skiing like slalom and giant slalom would get more benefit from a stiffer boot.

Skiing ability: Try to avoid getting the stiffest racing boots on the rack just because most of the world cup racers are wearing them. Unless you are a true expert skier most people will benefit from something slightly softer.

Footbeds

Ski boots all come with a removable footbed that is quite flat and generic to most people's feet, not unlike the thin footbed that comes in our everyday shoes. These can be replaced with other more substantial products such as a custom footbeds that can correct stance deficiencies and increase performance in some skiers. It can be a very personal thing to ski with or without a custom support under your foot and ultimately experimenting with advice from a reputable boot fitter can be advantageous to getting comfort and performance out of your boots.

Forward lean

Forward lean refers to the angle the boot holds your lower leg relative to 90°. It allows the skier to balance their center of mass over their feet and move through a controlled range of motion. How much forward lean a skier needs is specific to a skier's body type, ankle range of motion and how long certain bones are in relation to the skier's torso etc.

Ramp Angle

This is the angle of foot relative to the bottom of the ski boot and is sloped downward from the heel to the toe. It is measured in degrees and can range from 3 to 6 degrees depending on model and type of ski boot. The ramp angle helps the skier move their centre of mass towards the tip of the ski.

A good test to see if ski boots have the right combination of forward lean and ramp angle is to try the following exercise. Make sure the ski boots are buckled up tight as you would when skiing. Next crouch down as low as you can without losing your balance backwards. Make sure to stretch the arms out as far as possible in front of the body at shoulder level.

If you can't get your hips level like in the picture above, then your boots may need more forward lean and ramp angle adjustment. Try the exercise with lifts under your heels and toes to see how differences in forward lean and ramp angle can affect your balance.

A simple way to increase or decrease the amount of forward lean when skiing would be to insert or remove the boot's spoiler. Some boots come with this as standard while others can be installed by placing flexible but firm material between the back of the liner and boot cuff. These spoilers can add or take away up to 4 degrees of forward lean.

A **spoiler** inserted between the shell and liner will increase the amount of **forward lean**

To adjust the ramp angle, remove the ski boot liner and install a heel wedge with adhesive tape from 3mm to 10mm in height. Re-install the liner in the boot and re-assess the sense of balance using the Ski Boot Stance Squat. If you do not have access to proper heel wedges, simple wedges can be made with cardboard of varying thicknesses and adhesive tape.

Cuff alignment

Some ski boots will come with an adjustable upper cuff allowing it to tilt inwards or out to suit different individuals' stance and lower leg alignment. A general guide to determine if the cuffs are aligned properly is to have the skier stand inside their shells and on their footbeds (without the liners). Do the buckles up so the shell is closed and have the skier assume their normal skiing stance looking ahead. The gap between the skier's leg and plastic shell should be similar on either side of their legs. If there is a significant difference the cuff should be adjusted to match the skier's lower leg.

Lateral canting

Lateral canting is where the angle between the bottom of the boot and ski is altered to tip the skier's lower leg either in or out. This alteration can have a drastic effect on how the skier's edge holds during a turn and the alignment of their body. The angle is usually cut into the sole of the boot using specialized equipment or a canting strip placed between the ski and binding.

Under-canted skiers tend to look knock kneed during a turn. They angulate overly (usually from the knee) to try to achieve a platform angle and get the skis' edges to grip. In doing so, most of the time these skiers will also end up with excessive forward pressure as skiers tend to push their knee forward as they rotate their leg inwards (for knee angulation)

Photos DSP

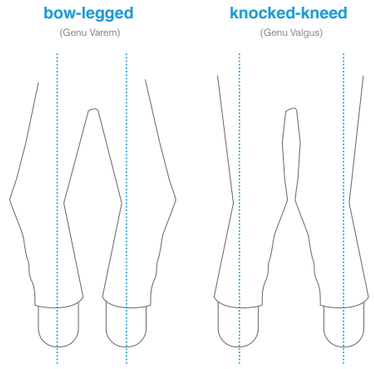
Over-canted skiers often look bow legged and ski with their feet close together. Their outside knee might wobble during a hard pure carved turn. It's hard for these skiers to get the outside ski to slip without taking on the bow legged appearance.

Photos DSP

A good way to test if a skier is well aligned is to get them to ride a flat ski in a basic relaxed stance on gentle terrain. From this position they need to be able to tip both skis on to their edges in both directions just by comfortably rolling their knees, like an edge roll exercise. It should not take any extra movement or effort for the guest to do this.

It's important to note that instructors can face issues with all the above boot elements with our students. Point out where it can hinder learning. Sometimes we can improve fit and performance on the hill by adding material between the shell and cuff to alleviate canting issues or increase forward lean (trail maps work well).

Things that you might look for in your guest to determine if they need canting include:



1. **Do both legs look similar when the guest is skiing? e.g. the width between ski boots and knees should be similar.**
2. **Are they under-edged? In this case the skier will often look over-flexed in the ski boot and will find it hard to demonstrate the same edge angle in both skis in a basic traverse. Under canted skiers will appear to have knock knees while the skis are flat. Beginner students may appear this way when straight running.**
3. **Are they over-edged? In this case the skier often feels like the skis are grabby or railed and at higher levels may even feel as though their ski needs to have quite an extreme base bevel to compensate. Over canted (bowed) skiers will tend to stand on the outside edges of the skis while standing on flat snow. Straight running with beginners can highlight this.**

For your students' benefit, it then becomes your responsibility to look out for what could be an alignment issue. Recommend them to a reputable boot fitter in your area and follow-up by using your understanding of technical concepts to help explain some of the new feelings your guest may now be sensing. This is because they may now be standing and skiing in a completely different position than they are familiar with. Remember that change does not always feel immediately good, it often just feels different.

It's not only the severe cases that will benefit from an instructor suggesting equipment modifications. Every skier that pursues this sport can gain better performance and more comfort by tinkering with their boots.

For more information on boot setup and functionality check out Ron LeMasters book *Ultimate Skiing* (Lemaster 2010, p.157). Thanks to Brent Aimsbury (Park City Ski Boot) for his expertise in this area.

CHAPTER EIGHT: General Knowledge

SECTION THREE:

OUR ENVIRONMENT

8.3.1 THE AUSTRALIAN ALPS

All ski resorts on the Australian mainland are found within the southeast area of the Great Dividing Range. This mountain range extends along the east coast of Australia.

A new Alpine National Park, which includes Kosciuszko National Park in NSW and most of the Victorian ski resorts, now makes up the largest national park in Australia.

Ski resorts make up a very small portion of the Alpine National Park. As our chosen sport and profession takes place in this environment we must respect the 'leave no trace' code and promote the idea of minimising impact in the park through recycling and not leaving rubbish on the slopes.

The climate of the high alpine regions of southeastern Australia is common with mountains elsewhere in the world: colder, wetter and generally more unpredictable than the weather patterns at lower altitudes. Average rainfall is high, up to and greater then 2000mm annually, and much of this falls as snow during the winter months. At this time snow covers a large portion of the area above 1500 metres and can often fall much lower.

In summer the rainfall is fairly low and weather generally fine and warm, although summer snowfalls and thunderstorms are not uncommon. Rain and snow, when it arrives, will often clear away overnight although, in winter and early spring, it can persist for many days. Unseasonable weather rarely lasts more than a day or so and in general, fine weather prevails for much of the warmer months.

The main vegetation pattern of the Alpine Region can be loosely grouped into three zones: alpine, sub-alpine and mountain forests. The altitude of the tree line is controlled by air temperature that falls as altitude increases. The extent of the tree growth is generally lower on the cooler southern slopes and it decreases in altitude in the southern latitudes. The tree line can vary from 1500 metres in Victoria to 1900 metres in NSW.

The alpine zone is bare of trees but has low stunted vegetation which, due to exposure to high wind, forms close, ground-hugging mats or tussocks. There are many small wildflowers within this region and their blooms appear soon after the snow disappears in late spring. The flowering season continues through to late summer but it is usually best towards the end of December.

Another common feature of the alpine zone is large bog areas that are kept permanently wet by springs and ground water. These bogs can be up to two metres deep and consist of both living and dead vegetation but mainly sphagnum moss. This acts like a sponge, absorbing water from rain and melting snow and releasing it slowly throughout the drier periods of the year.

The sub-alpine zone is characterised by snow gum forest, the under-storey of which is fairly open. Moss and lichen grow on the trees and the smooth bark assumes bright colours ranging from grey through green to red, especially noticeable in the late autumn. Many of the alpine zone species of smaller plants grow in the snow gum forest but they are more upright and larger than their alpine relatives. The undergrowth in these forests varies from alpine grasses to native broom and alpine pepper.

The mountain forest consists of a far greater range of trees, the snow gum being replaced by taller, straighter species such as alpine ash, woollybutt and stringybark.

At lower altitudes on the southern side of the Great Dividing Range, the world's tallest flowering plant, the mountain ash, can be found. The eucalypt forests in the Alpine National Park are also among the best examples of mountain forests in the world and offer a unique skiing experience.

The Alpine National Park also contains many sites of interest such as the Snowy Mountains and Kiewa Valley Hydro Schemes, the historic town of Kiandra and remaining huts of the high country.

The Snowy Mountains Scheme is one of the most complex integrated water and hydro-electric power schemes in the world. The scheme collects and stores water that would normally flow east to the coast and diverts it through transmountain tunnels and power stations. The water is then released westward into the Murray and Murrumbidgee Rivers for irrigation. The scheme took 25 years to build and was completed in 1974 with the help of more than 100,000 people from more than 30 countries.

- **Kiandra was not just a town for gold miners and a residence for the Snowy Scheme; it was also the birthplace of skiing in Australia.**

As miners tended to be transient, little remains of the Kiandra settlement except some remnants of the mining works, the cemetery and some interpretive displays.

- **Huts of the high country have been built and lost from the area as far back as the 1830's.**

Most were originally built for high country grazing and many of the remaining huts are now a major part of our local history. Today, the majority of remaining huts are used for emergency shelter for snow travellers and bushwalkers. Unfortunately many have been destroyed in bushfires.

Please remember that the Alpine National Park is an area where we practice our profession. It is of utmost importance that you, your group or other users treat this area with care. As a caring snowsports instructor and citizen, further reading on the ecology/geography and issues facing the alpine area in Australia is recommended. Get to know the place where you teach and ski.

It is of great benefit to yourself and to your clients to know a little about your immediate and surrounding alpine environment. Know a few of the closest most prominent peaks near your ski resort. Find out some interesting facts about how they were named or how high they are. Did you know that Club Lake and Blue Lake in the Snowy Mountains contain the freshest water in Australia (lowest salt content)? Did you know that skiers used to run downhill races on some of the back country slopes behind Charlotte Pass?

For further reference one of the better texts to reference is *The Australian Alps* by Deirdre Slattery, 1998.

8.3.2 CLIMATE

The weather can change very quickly in the mountains. Meteorological forecasters study the movements of large masses of the atmosphere but deeply cut mountain ranges create eddies in the atmosphere that cannot be accurately predicted. As a result, the mountains produce their own weather. It should be noted that with advances in forecasting techniques the weather reports give reasonable accuracy for the whole region. Just be prepared for a change and that way you can always be prepared to enjoy the mountains.

Precipitation

In the winter months there is generally a strong westerly airstream over southern Australia, bringing orographic precipitation as the result of moist air rising over the mountains and cooling, which then falls as either rain, snow, ice, hail or mist.

It should also be noted that different parts of the alpine region receive varied amounts of precipitation due to their location, however, you can expect more consistent rainfall at the highest parts of the mountain range. The eastern side of the mountains tends to be in a rain shadow where less rainfall is produced (i.e. along the Monaro Plains/Snowy River valley and the Omeo valley).

Snow

The snow that falls in the alpine areas tends to stay for many weeks of winter mostly above about 1400-1500 metres with the most usable depth for snow sport enthusiasts above 1600 metres.

Snow depths for the Kosciuszko National Park have been measured since 1954 along Spencer's Creek, near Charlotte Pass, due to the lack of snowdrifting in that area. Average snow depths tend to be more than one metre during the period of July to mid-October, although this varies from year to year. One of the highest snow depths recorded was 3.6 metres.

Temperature

Average daily temperatures in the mountains range from about -5°C to about 5°C in the winter, to a summer average of 5°C to 20°C.

The thing to remember though, is that the temperature falls on average by about 7 to 8 degrees for every 1000m in altitude increase. The tree line on the mountains is there because the average temperature becomes too cold for trees to grow at that altitude. It is worth noting that some valleys of the sub-alpine zone will also lack trees. Known as an 'inverted tree line' it is caused by cold air pouring down off the high country.

Wind

In winter, the prevailing winds are westerly and quite often very strong. Gale force conditions are not uncommon and winds have been regularly recorded above 100km/h.

Warnings about the possibility of dangerous weather

Temperatures that are below freezing are very common and can happen at any time of the year in the high country. Anyone parking a car overnight should use antifreeze in their car to avoid unwanted complications.

Clear, sunny skies combined with cold temperatures can disguise the risks of high intensity sunlight, especially the ultraviolet component. As a result, it is your responsibility as an instructor to promote the Australian 'Slip, Slop, Slap and Wrap' cause to reduce the probability of skin cancer.

Heavy rain and the possibility of lightning are ever-present in the alpine environment. The height of lift towers and the surrounding peaks make a good conductor of electricity, so it is always safer to be inside in these conditions.

The combination of cold, wet, windy weather (classic Australian high country conditions) is the exact catalyst for producing hypothermia in the under-prepared snowsport enthusiast. Be aware and be prepared for any changes.

8.3.3 AVALANCHE AWARENESS

Avalanches do happen in Australia and they do kill.

'7.20am 12th of July 1956, tragedy struck as an avalanche raced down the slopes of Mt. Clark in the Kosciuszko main range area, wiping a small eight-bed prefabricated lodge off its foundations. It instantly killed one of the occupants'.

The path of this avalanche was no more than 50 metres across. It was the result of a heavy snowfall on previously icy conditions, something that is not uncommon in Australia.

Other small slips or avalanches have been sighted over the years in many of the resorts including Mt. Hotham, Mt. Buller, Mt. Nelse and even Smiggins Hole.

This section of the manual is by no means intended to make you an expert on avalanches. It aims to help you to gain an awareness of the natural warnings and a respect for the dangers of avalanches.

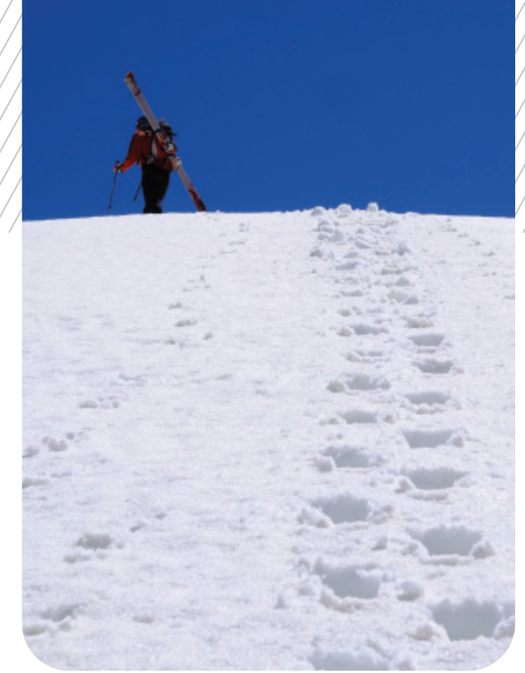
Factors

Many things can cause the snow to weaken, become unstable and fail to hold to the mountain.

Snow pack that has been affected by the wind, sun, temperature and amount of snow is a major factor. What makes it dangerous is when the weight of the snow pack exceeds the force to hold it in place on the slope. The steepness of the slope and its orientation (the direction it faces) and even what the snow is laying on, e.g. rock, can also affect the way snow is deposited and therefore its load capability.

Triggers

- **Rapid loading of snow slopes by additional snowfall, rainfall or wind drifting of snow onto the leeward slopes**
- **A sudden temperature rise**
- **Long cold periods**
- **Explosions or a sonic boom (watch out for the air force training in the mountains)**
- **A snowsports enthusiast (their additional weight on the snow surface is the most common trigger of all).**



Important to also be aware of:

- **Most fatalities are caused on slopes of 30-40 degrees. If it looks like fun to ski, then it will probably be steep enough for an avalanche.**
- **Topography, in other words the lay of the land. Gullies are very common in our mountains and can be nasty terrain traps. Look out for signs such as a cornice at the top or wind scouring on the top of the hill that deposits snow on the leeward slope.**
- **In 2008 an avalanche fatality occurred and was triggered by someone standing on top of a cornice and it collapsing underneath him. If possible, steer clear of cornices because when they break they bring down a lot of weight and can trigger a slide much bigger than the cornice itself. This avalanche was around 50m x 50m and several metres deep.**

Types of avalanches

- **Loose snow: typically start at one point and grow in size as they descend.**
- **Slab avalanche: readily identified by the well-defined fracture line where the moving mass of snow breaks away from the rest of the snow pack. Slab avalanches come in many forms, wind slab, wet and soft and as a result they can be quick or slow release (wind slabs are very common in Australia and can be the most destructive type of avalanche).**
- **Climax avalanches occur when many snowfalls or even all the full season's snow can come off the mountain at once.**
- **Ice avalanches happen as a result of an ice wall on a cliff or seracs come loose causing many tonnes of ice to come crashing down.**

Hazard evaluation and critical factors

(from *Avalanche Safety for Climbers and Skiers*, by Tony Daffern)

1. COULD THE SLOPE PRODUCE AVALANCHES?

Is the slope steep enough to slide?

- slopes greater than 30°
- convex rollovers are more likely to fracture and create a slide
- cliff band

What is the orientation of the slope to wind?

- lee slopes face away from the wind. Is the wind or recent wind blowing snow onto this aspect and loading it up with layers of snow?

What is the orientation of the slope to the sun?

- northerly facing slopes exposed to lots of sun. (causing large temperature changes as the sun heats the snow during the day).
- first major thaw of spring.

What is the nature of the slope?

- open slopes
- thin forest
- confined slide path
- gully or bowl

2. IS THE SNOW STABLE? COULD IT FAIL? HOW DEEP IS THE SNOW PACK? ARE THERE ANY SIGNS OF AVALANCHE ACTIVITY?

What layers are there in the snow pack?

- very hard or soft layers
- weak bond between layers
- 30cm or more snow above a weak layer
- wet snow

How much fresh snow has fallen?

- snowfall greater than 2cm per hour
- new snow depth greater then 30cm
- slow settlement of new snow
- very light or heavy new snow
- heavy stiff layer above a light weak layer
- heavy rain

Wind

- moderate or strong wind
- cracking and settling of snow

Air Temperature

- rapid rise in temperature
- above freezing temperatures
- sun on slope under consideration
- sun with hazy sky
- temperature inversion

Humidity

- high relative humidity during snowfall or periods of moderate and strong winds.

3. WHAT WILL HAPPEN TO ME IF THE SLOPE AVALANCHES?

Depth of snow

- deep weak layers in snow pack
- foot penetration greater than 60 cm

Type of avalanche

- stiff slab above weak layers
- heavy wet snow
- slope not avalanched recently

Terrain

- long open slope above
- restricted deposition zone
- drop off below
- trees to wrap around

4. WILL CONDITIONS GET WORSE?

- continuing snowfall
- increasing temperature
- strong wind

Rescue

As a snowsports instructor both in Australia and more often overseas, you may be asked to assist in a rescue. In most cases people with more experience will usually be called upon first, although in a ski resort, employees are a good source of volunteer help if an avalanche has caught a victim.

Apart from ski patrol, other search personnel may include members of the VicWalk Bushwalkers Search and Rescue, SES, and State Police Search and Rescue squads.

There are a few pieces of equipment and terminology that you may come across during a search that you will need to be able to recognise and understand the purpose of so you can be of help:

- Fast surface search: in most cases the best thing to do is to make a quick surface search of the area as victims will often only be partially buried. Finding some small part of them sticking out of the snow can dramatically improve the chances of survival;
- Probes are used to stick down into the snow to feel for hard objects that may be victims who are trapped. A well-organised search line works best by probing in a systematic search pattern, even if there are only two searchers. If you don't have a probe, use a ski pole;
- Avalanche search beacon or transceivers are devices that transmit and receive signals. The key here is both victim and searcher need to be carrying one. When enjoying snowsports in avalanche prone areas such as the bac kcountry or heli-skiing throughout the world, carrying a transceiver is a necessity;
- Avalanche shovel is simply a lightweight, large bladed shovel that can be carried by a back country traveller. If you don't have one, use your hands for digging;
- Helicopters are often used to transport injured people from the scene of an avalanche. It is worth noting that a helicopter has a blind spot that covers all of the back of the craft around the tail blades, so you should always approach a helicopter in the pilot's field of vision;
- Avalanche rescue dogs are often used in a search situation as their keen sense of smell can be of great benefit when looking for victims. A few things to remember if helping in a search where dogs are being used:

1. Always keep the probe lines moving. Do not wait for the dog team unless instructed by the dogs' master.
2. Never contaminate the search zone with food scraps, urine, cigarette butts etc.

Risks

When evaluating the risk of an avalanche, the smart way of making decisions in the mountains is based on many factors, not just one test. Assess factors such as recent weather, a variety of tests, field observations and good guiding procedure (one person exposed at a time) before going near avalanche risk terrain.

There are always inherent risks associated with action sports such as the snowsports we partake in. The instructor though, like a super hero, seems to feel that the chance of hitting an obstacle (for instance) is very small. However, we cannot control an avalanche. The risks involved in riding an area where snow may slip are very high and should be taken very seriously.

If your job allows you to enjoy a northern winter in areas where avalanches are more prevalent, then you should do everything in your power to keep furthering your knowledge when it comes to the dangers of avalanches. Be prepared to avoid a bad situation, as avoidance is the only cure.

Some interesting websites to reference include:

http://www.fsavalanche.org/slideguide/new_slides/slide1.html

http://www.ananova.com/news/story/sm_1261997.html?menu

SECTION 8: REVIEW

Section 1 - History

1. **In which NSW town was the first Australian ski club formed and in what year?**
2. **The APSI was formerly known as which association and in what year was it founded?**
3. **What year was the first illustrated ski manual published?**
4. **What year were alpine events included in the Olympics?**
5. **Where and when was the first Interski held?**
6. **In which years did the following disciplines join the APSI:**

   a) snowboard

   b) telemark

   c) Nordic

Section 2 - Equipment

1. **What is the most versatile ski for a guest and instructor to use?**
2. **What might an instructor need to be aware of when demonstrating on twin tip skis?**
3. **What are some reasons for tuning your skis?**
4. **What does a good alignment system include?**
5. **What is the responsibility of the instructor if you notice your guest has an alignment issue?**

Section 3 - Our Environment

1. **The weather can change very quickly in the mountains. Which factors of the Australian alpine climate should we be careful about?**
2. **What types of avalanche can occur in the Australian Alpine Environment and briefly describe each?**
3. **Explain the environmental philosophy of the "leave no trace" code.**
4. **Vegetation in the alpine region can be grouped in which three zones?**
5. **What's the best time of year to look at wild flowers?**
6. **Explain a fast surface search?**

APPENDIX

1. MEDICAL CONDITIONS AND ENVIRONMENTAL INJURIES

MEDICAL CONDITIONS

The following information is taken from "Coaching Athletes with Disabilities: General Principles."

Asthma

Definition: A condition in which the bronchial tubes become unusually sensitive to a variety of different "trigger factors" that can stimulate a narrowing of the bronchial tubes making it difficult to inhale and take oxygen into the body, and/or exhale in order to expel carbon dioxide.

Symptoms: The most common symptoms are coughing, wheezing, chest tightness, difficulty in breathing, fast heartbeat, anxiety and tiredness.

Symptoms may cause a sudden attack that may last anywhere between a few minutes to hours.

Precautions: The common trigger factors are:

- **Animal fur or hair**
- **Colds, sore throat or influenza**
- **Exercise**
- **Cold weather or wind**
- **High or low humidity**
- **Sudden changes in weather or temperature**
- **Some foods**
- **Smoke or fumes**
- **Some emotional reactions e.g. laughing, crying or excitement**

Management: The basic approaches to managing asthma are avoiding the trigger factors and taking medication. Students with asthma will be exposed to some of the trigger factors when skiing. However, they should not be disadvantaged due to their condition. Your awareness of the condition and a management plan will ensure that they are at minimal risk.

The most common methods of administering asthma medication are the 'dose inhale', a puffer (which may best be used with a spacer) and the nebuliser (inhaling through a mask attached to a small compressor). In our situation the most common is a puffer. Ensure you know of any children (or adults) in your group that may have asthma and that they have a puffer with them at all times.

Dealing With An Acute Asthma Attack

1. **Allow the student to use prescribed medication as soon as possible.**
2. **NEVER encourage the person to try to keep going through the attack.**
3. **Help the student to relax by keeping calm and avoiding panic. The anxiety of your student will increase if those around them are not calm.**
4. **If the symptoms do not respond after 4 doses of mediation, seek medical help.**

Diabetes

Definition: A disease characterised by insulin deficiency. Insulin helps to regulate blood glucose concentration and how glucose enters the cells of the body. If insulin supplies are deficient, then the energy that glucose provides does not reach the cells and the body cannot function properly.

Symptoms: Hyperglycaemia (High Blood Glucose):

- **Excessive urination and thirst**
- **Itching skin**
- **Slow healing sores and cuts**
- **Blurred or reduced vision**
- **Increased appetite with weight loss**
- **Tires easily, drowsiness, fatigue**
- **Headaches**
- **Nausea and sluggishness**
- **Unconsciousness**

Hypoglycaemia (Low Blood Glucose):

- **Hunger, pallor, weakness and perspiration**
- **Mental confusion**
- **Muscle spasm/tremor (the shakes)**
- **Nausea**
- **Changes in behaviour (aggression or unusual quietness)**
- **Loss of balance**
- **Blurred or jumpy vision**
- **Fits**
- **Sleepiness**
- **Coma**

Any student who displays any of the above symptoms should follow the guides described below.

Precautions: In most cases, diabetes presents no real problem in terms of being able to learn to ski. However, the increase in the intensity of exercise, the climate

and altitude change will affect the balance of diet and medication.

Management: Treatment is usually based on 2 -4 injections given by the student (or their parents) per day. To balance the insulin, regular meals and snacks containing slowly absorbed sugars (complex carbohydrates such as bread or pasta) should be taken.

Dealing with diabetics in emergency situations

Usually the diabetic will be able to tell you that they require rest. If this does not occur and the student collapses, if needed, move them to a safe place and keep them warm.

If the student is conscious:

- **Give them glucodin tablets, if not available then sugar. This can take the form of a sweet drink (not diet drink), barley sugar, jelly beans or honey.**
- **Follow with complex carbohydrates such as a sandwich or cracker biscuits.**
- **Observe the student until they recover completely.**

If the student is unconscious (fortunately this is rare):

- **Place the student in the coma position and send for help immediately.**
- **Do not give them any fluid or tablets as they may choke.**
- **Observe the student until medical assistance arrives.**

Epilepsy

Definition: This term is interchangeable with seizure disorders and convulsive disorders and refers to a condition that results in the temporary breakdown of the central nervous system. Breakdowns can range from a few moments of inattention to unconsciousness. They may have uncontrolled contractions of the limbs and body lasting up to five minutes or more. It is not contagious, nor does it indicate any intellectual disability.

Symptoms: As seizures range from moments of inattention (Petit Mal) to fits (Grand Mal), the symptoms also are varied. They may include:

- **Twitching of the eyelids or eyebrows**
- **Ceasing activity**
- **Staring vacantly**
- **An “aura” or sensation may occur prior to a fit**

Precautions: Students on medication may show effects such as drowsiness or inattentiveness or lose concentration during an activity. Avoid rapidly changing environments, flickering lights, flashing or strobing lights. Flat light or tree skiing may activate a seizure.

Management: Most students will have a medication program and will inform you of their condition. If you suspect a student has epilepsy you should monitor for signs or symptoms.

Dealing With A Seizure Or Fit

1. **Do not restrain the student.**
2. **Do not put anything in their mouth.**
3. **Let the seizure take its course.**
4. **Make the environment safe.**
5. **Clear the area around them and if possible place a jumper or pillow under their head 6. When the seizure has subsided, turn them on their side and keep them warm and calm.**

Seek Medical Assistance Immediately If:

1. **A seizure continues for more than 10 minutes.**
2. **Seizures continue one after the other.**
3. **The person injures himself or herself.**
4. **The person is not a known epileptic.**

ENVIROMENTAL INJURIES

Exposure

Exposure can be fatal. It is the rapid failure of the body to conserve heat. Watch out for the warning signs – weariness and reluctance to carry on, clumsiness, loss of judgement or collapse. Shivering may be absent. The combination of fatigue, poor insulation (from wet or thin clothes) and cold, wet, windy conditions can lead to death.

Cold Kills

The moment you begin to lose heat faster than your body produces it, you are undergoing exposure. Two things happen; you voluntarily exercise to stay warm and your body makes involuntary adjustments to preserve normal temperature in the vital organs.

A decrease in body core temperature to a point at which normal muscular and brain functions are impaired is known as hypothermia. If the core body temperature falls, muscle, brain and circulatory failure occurs.

Physiological mechanisms act to maintain body temperatures in a cold environment by:

- **Constriction of blood vessels in the skin and extremities. This will result in a decrease in blood flow, which leads to a decrease of temperature in the skin to a level close to the environment. This will help reduce heat loss.**
- **Shivering which helps produce heat but it burns up more energy and leads to exhaustion.**

Stages of Hypothermia

Mild

Sensation of numbness, shivering, minor impairment in muscular performance

Slight muscular un-coordination, weakness, slow stumbling pace, confusion, and apathy

Gross muscular un-coordination, stumbling, mental sluggishness, slow thought and speech

Shivering stopped, severe muscular un-coordination, unable to walk, incoherence, confusion, irrationality

Muscular rigidity and semi-consciousness
Unconsciousness

Death

Severe

Prevention

Hypothermia is easy to prevent. When it occurs it is usually from lack of prevention rather than unavoidable circumstances. These simple measures will prevent the likelihood of hypothermia:

- **Adequate protection from cold, wind and moisture.**
- **Regular intake of food and non-alcoholic drinks.**
- **Sound planning, training and experienced leadership.**

Be alert for early signs and symptoms:

- **Fatigue**
- **Shivering**
- **Forgetfulness**
- **Stumbling**
- **Slowness**
- **Paleness**
- **Slurred speech**
- **Behaviour change – unusual or irrational**
- **Apathy**
- **Weakness**
- **Person feels ‘cold’ or ‘strange’**
- **Confusion**
- **Careless about protection against the cold**
- **Lack of coordination**
- **Exhaustion**

Treatment:

- **Remove from cold environment**
- **Remove wet clothing**
- **Body heat – body-to-body contact/huddle together. This is the best way.**
- **Use blankets**
- **Insulate body, especially head**
- **Hands in armpits**
- **Give a conscious and alert person sips of lukewarm drink and something to eat**
- **Seek medical aid**

DO NOT rewarm person rapidly – it may cause shock or death.

DO NOT put body parts in water.

DO NOT give alcohol or cigarettes.

DO NOT massage or rub extremities.

DO NOT encourage exercise if tired.

DO NOT expose person to hot air or radiant heat as it may cause burns.

Things to remember

- **The majority of heat loss is through the head.**

Young children have a larger head in proportion to the body compared to adults; therefore a greater percentage of heat is lost through the head.

- **Wind chill.**
- **Wet clothing: children have more surface area to volume compared with adults.**
- **Redness will return and a person will feel pain as warming occurs.**

Heat Exhaustion

Heat exhaustion can occur in the alpine environment. For example, somebody wearing too many clothes while using considerable energy can overheat.

Signs and Symptoms

- **Perspiration**
- **Person feeling thirsty**
- **Dizziness**
- **Nauseated**
- **Fatigue**
- **Weakness**
- **Feels hot**
- **Redness, pale**

Treatment

- **Remove excess clothing**
- **Rest**
- **Give drink, not too much at a time**
- **Too rapid a decrease in temperature can result in shock or hypothermia**
- **Seek medical aid**

2. GLOSSARY

Active Absorption

A contraction of the thigh and/or stomach muscles allowing a flexion of the body as the legs are pulled upwards, resulting in the same position as passive absorption, but activated by muscular effort.

Active leg turning

Where the leg muscles are actively turning and twisting the femur inside the hip joint, therefore turning the ski.

Alignment

Refers to the way our musculoskeletal system is positioned in relation to the external forces in skiing i.e. how the joints, leg bones and ankle line up.

Angulation

Angulation refers to the movement of certain body parts (knee, hip and upper body) to increase the edge angle without changing the amount of inclination of the centre of mass. It also helps you to balance over the outside ski.

Anticipation

Refers to the upper body (only) facing more towards the fall line during the turn transition.

ATM

Australian Teaching Method.

Banking

Leaning into a turn without angulation.

Basic Position

A combination of stance and angulation.

Biomechanics

The study of how to move the body into the best position to make and deal with the forces that we encounter in skiing.

Braquage

Also known as pivot slips. Simultaneous leg rotation with skis parallel, skis stay flat as you sideslip down the hill.

Canting

Canting is a term used to describe the method used to mechanically alter the way we align.

Carving

Is the same as steering but with more speed, more edge angle and therefore, a stronger edge grip. Carving taps into the side cut and ski design to help with direction change but also relies on a strong twisting effort from the legs to guide the skis, breaking them off an otherwise railed path. The track left in the snow by the outside ski will be about 10cm wide from beginning to end.

Centrifugal Force

The imaginary force pulling a skier to the outside of the turn.

Centripetal Force

The force that causes a skier to turn by pushing the skis around the turn.

Christie

(Christiana) A parallel steered arc.

Counter

Is used to describe the position of the hips/upper body when they are facing away from the direction of the skis. Usually down the hill or to the outside of the turn.

Counter-rotation

The small amount of turning force applied to the skis in one direction by a fast twisting action of the upper body in the opposite direction.

Centre of Mass

The point at the centre of a body's weight distribution where gravity can be considered to act.

Closed Question

A closed question is one that limits the response to one or two words. This question is useful when you need some definite answers from your students without lengthy discussions.

Crossover

Movement of the centre of mass across the path of the skis during the turn transition. Typical in carved & pure-carved turns.

Cross-under

Movement of the legs side to side under the body while keeping the centre of mass undisturbed. Seen predominantly in short turns.

Customer Service

Customer service is an attitude to the way you do business and includes all the points of Chapter 1.1.

Down-unweighting

Reducing pressure on the skis by a fast flexion of the legs thereby dropping the centre of mass.

Edging

Adjustment of the ski's edge angle with the slope.

Edge Angle

The angle between the ski base and the slope.

Edge Change

Changing from one edge or set of edges to the other.

Extension

Straightening the leg or legs either to maintain snow contact, as in moguls, or raise the centre of mass, as in up-unweighting or re-centring. Can assist flattening of the skis. Independent leg extension controls weight shift.

External Customer

These are the guests who come to your resort for a snow vacation. They are customers in the traditional sense of the word because without them, there would be no sales, no business and no ski resorts to work at.

Fall-line

An imaginary line perpendicular to points of equal altitude. If a ball was placed on a slope then it will roll down the fall-line. The fall-line often varies over the slope.

Fan Progression

A succession of single turns, starting after the fall-line, each one increasing the amount of direction change. Often used to work on turn completion.

Reverse Fan Progression

Same as fan progression but begins at the fall-line and finishes in a full turn. Like an upside down question mark it is often used to work on turn initiation or turn transition.

Flexion

Bending the legs either through muscular effort or by applied external forces.

Garlands

('Chicken out' turns) Turns linked diagonally across a slope. A tool for working on repeated turn initiations or completions. Also good for losing altitude on steeper slopes with fearful students.

Herringbone

Method of climbing gentle slopes in a skating position (ski tips apart).

Ideal Performance State (IPS)

This is the optimal state of physiological and psychological arousal for performing at your peak, and can be likened to the feeling of being 'unbeatable', 'in the zone' or 'on a roll' etc.

Inclination

Moving the body's centre of mass to the inside of the turn. Must exist in every balanced turn.

Internal Customer

The internal customer is everyone who works inside the company and the resort. More directly, everyone working for the snow sports school.

Isometric Contraction

When a muscle performs work while staying the same length.

Matching

Bringing the skis to a parallel position, either by moving one or both skis.

Mental Imagery

Mental imagery (also known as mental rehearsal or visualisation) involves using all the senses to recreate or create an experience in the mind. It is a mental technique that programs the mind and body to respond optimally.

Middle Position

Relates to the vertical dimension of stance. It's a good athletic position with room to move up or down vertically.

Open Question

An open question is used to start a discussion and gain more general information about your students.

Passive Absorption

Flexing the legs as a result of external forces. Like a bump or turn dynamics.

Passive leg turning

Letting the legs turn independently under a stable pelvis from edging movements and ski design. This is how a basic position is created naturally in a dynamic long turn or pure carved turn. The femur still turns inside the hip joint, but it does so through edging movements and due to the natural arc of the skis pushing the legs around as the pelvis and upper body remain still.

Physics

Skiing physics is the study of the forces that we encounter in skiing. Understanding the forces helps us understand the mechanics of skiing which in turn helps us teach the sport more simply and clearly.

Pivoting

Turning the ski while it is flat.

Platform Angle

This is the angle between the skier's resultant line of force and the base edge of the outside ski. If this angle is greater than 90 degrees the ski will slip. When this angle is 90 degrees or less the ski will rail (no sideways slipping).

Pressure Control

The umbrella term that describes the movements made to manage, control and manipulate the changing pressure involved in skiing to avoid the disruption of balance. Pressure changes come from two sources: movements made by the skier and variations in terrain and snow condition.

Professionalism

This encompasses everything instructors and all resort employees should excel at to ensure the guests' experience in the snow is a great one (see chapter 1).

Projection

Movement of the body towards the centre of the new turn to get inclination. May include forward movement to pressure ski tips.

Rebound

The main cause of the rebound is the "pole vault effect". When a skier sets their edges, the snow exerts a force on the skier similar to the one exerted on the pole vaulter. The resulting upward redirection of the skier's momentum results in an up-unweighting that is interpreted as rebound.

Retraction

Pulling the legs towards the stomach using muscular effort.

Single turns

Single turns usually start in or after the fall-line and finishes by taking the skier slightly uphill. Good for working on turn completion, were previously known as uphill christies. A list of the various single turns can be found in Ch 6.

Skating

A similar action to rollerblading. Used for moving uphill and for increasing speed on the flat and downhill. Skating on skate-specific Nordic skis is an excellent fitness training method for many alpine and telemark skiers.

Skidding

A combination of the ski sliding forwards whilst slipping sideways. Can be a result of not having skis sufficiently edged. Depending on the skier's desired outcome, it may be considered good or bad, and may require encouragement or correction.

Steering

Is the art of guiding the skis through a smooth, round turn. Although this turn type has a strong emphasis on leg turning, the turn is created by appropriately blending all of the four skills together. Steering is not the same as skidding; therefore a consistent track is left in the snow by the outside ski and will be about 30cm wide from beginning to end.

Stem

Positioning the skis in a small V position using one or both skis, in order to initiate a turn.

Telemark

The original turn developed before parallel technique. The free heel binding allows greater flexibility and fore/aft stability so a variety of turn manoeuvres can be executed.

Turning Effort

Internal forces needed to twist or pivot the skis.

Unweighting

Decreasing or eliminating pressure on the skis.

Up-unweighting

Extension of the legs triggering an unweighting effect at the end of the movement.

Wedeln

Short rhythmical turn, introduced and named by the Austrians. The term has been adapted internationally.

Weight Shift (weight transfer, weight change)

A partial or complete shift of weight or balance from one ski to another.

XC / Cross Country Skiing

Also referred to as Nordic, langlauf, ski touring, skinny skiing and skate skiing. Skis are lightweight with a free heel binding. Mainly done on non-lifted terrain.

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Snow sport instruction manuals from other countries are also recommended.

The Internet also provides a broad range of up-to-date information on relevant topics.

AUSTRALIAN PROFESSIONAL SNOWSPORT INSTRUCTORS

www.**apsi**.net.au