

Cross Country Level 1 Workbook 2020



Welcome to the wonderful world of Cross Country (XC) ski instruction! This Certification workbook is designed to lead you down the path of learning and understanding so that you can become a better teacher and achieve your goal of certification. Please do not be overwhelmed when you start looking at this workbook because a great deal of information is presented here. Periodic quizzes are provided to help you process this information and check your understanding.

When you are ready to take the quizzes, please answer the questions on the answer form only, which is provided at the end of this workbook. Please bring the answer form to your assessment.

To put the ideas of this Workbook into context, here is a very basic overview of a ski lesson: you will meet new people; create a friendly relationship with them and build some trust; find out what they want to get out of the lesson; watch them ski and compare that to a more ideal way to ski; create a lesson plan with input from the student; bring them to appropriate terrain for learning something new; implement the lesson plan by suggesting and demonstrating simple drills and exercises to help them better reach their goals; and give them feedback about how they're doing.

In order to complete this process, it's helpful to understand the following:

- a. Current thoughts on how to best create a relationship
- b. The latest in efficient ski technique
- c. How to create a logical process of presenting information to students
- d. How to observe skiers and ways to help improve their efficiency.

- e. How to deliver positive feedback, and much, much more.

There are 8 divisions of PSIA-AASI across the country with over 30,000 members. Imagine if every instructor (Cross Country, Alpine, Snowboard, Telemark, Adaptive, Children's and Freestyle) were out teaching their own version of sliding on snow. A student could take a lesson at a nordic center in Utah, then go to Colorado or Vermont to take another lesson and get a completely different version of the same sport. Confusing! Therefore, PSIA-AASI is striving for 'best practices' and looks to standardize all the information so that instructors across the country can be on the same page for consistency. With that in mind, just as in other professions (geology, political science, music, bowling) there is a language that goes along with ski instruction so we can all be clear when talking to each other and to our students.

Certification is part of the journey toward understanding snowsports language and its application to the lesson described above. This Cross Country Level 1 Workbook is an introduction to this language. In order to get the most out of your Level 1 prep clinic (if your division holds one), please complete as much of the quizzes in the workbook so that when you attend the prep clinic you will understand so much more, and then the assessment will be more in your reach.

Useful references include:

- The *PSIA Cross Country Technical Manual*
- The *PSIA-AASI Teaching Snowsports Manual*
- The *PSIA-AASI Children's Instruction Manual, 2nd Ed.*
- PSIA-AASI Certification Standards and the future Performance Guide
- PSIA-AASI web site (thesnowpros.org)
- Your fellow instructors. If possible, find an experienced PSIA-AASI certified instructor to be your mentor. Be an active learner!

Course Content – All Quizzes highlighted in blue

The Learning Connection

Introduction to the Learning Connection

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- **People Skill- Quiz #1**

Technical Skills

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- **Braking Downhill Maneuvers**
- **Braking Downhill Maneuvers quiz #5**
- **Equipment Quiz #6**
- **The Cross Country Technical Model and Movement Analysis (MA)**

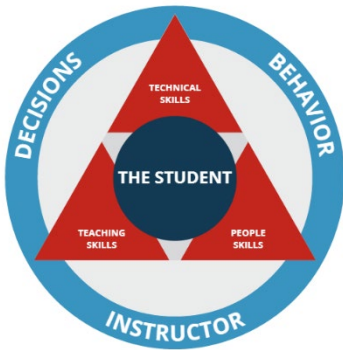
How the Model Works

- **Compare the Real to the Ideal- Quiz #7**
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The Learning Connection



Introduction to the Learning Connection

“The Learning Connection serves as a framework for the snowsports instructor’s development and is used as a template for the workbook. It provides clarity by breaking effective snowsports instruction into three separate domains: **People skills, Teaching skills, and Technical skills** ... With the student at the center of the learning environment, the instructor is represented in the outer ring. Instructors base their decisions and manage their behaviors to create connections that foster lasting bonds and learning” (*Teaching Snowsports*, p. 14-15).

People Skills

Effective instructors use interpersonal skills to build trust and connect with their guests (People Skill #1). Guests learn to trust an instructor who shows genuine interest in each student right from the start of the lesson. While we are showing interest, we are also assessing our students by interviewing them verbally (People Skill #2) and by carefully observing other non-verbal cues that tell us about our students' motivations and emotions.

People Skills Fundamentals
<ol style="list-style-type: none"> 1. Develop relationships based on trust. 2. Engage in meaningful two-way communication 3. Identify, understand, and manage your emotions and actions. 4. Recognize and influence the behaviors, motivations and emotions of others.

In addition, we as instructors must recognize that we bring our own set of emotions into the lessons we teach (People Skill #3). If we are having a bad day, or we realize that we don’t actually like something about one of our students, we need to recognize and manage these feelings so that we can still teach a good lesson. Finally, we need to guide our students to ski well by positively influencing their behaviors, motivations and emotions (People Skill #4).

People Skills-Quiz #1

1. The student is the center of the Learning Connection Model because

- a. The student follows the instructor's lesson plan
- b. It makes a nice picture
- c. The student's goals and abilities determine the lesson plan.

2. When we first introduce ourselves to our students, we should always spend at least 5 minutes explaining our qualifications as an instructor before doing anything else.

- a. True
- b. False

3. The most important feeling that students can have toward their instructor is

- a. friendship
- b. respect
- c. trust
- d. admiration

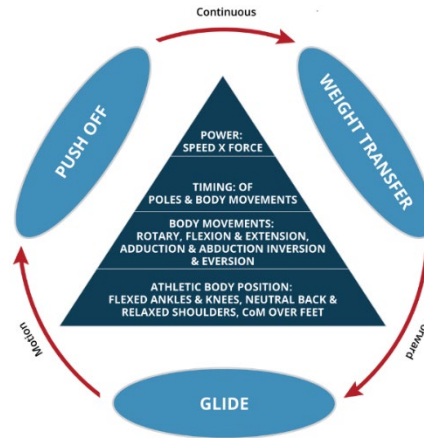
4. Two-way communication involves

- a. Listening
- b. Asking questions
- c. Observing non-verbal cues
- d. All of the above

5. You have a student that complains about everything. You realize that you really do not like this person so you...

- a. Try to find the source of their complaints and proceed with teaching the lesson
- b. Ask one of your fellow instructors to take this student
- c. Tell this student they are wrong for complaining so much
- d. Pay more attention to the other students in your class

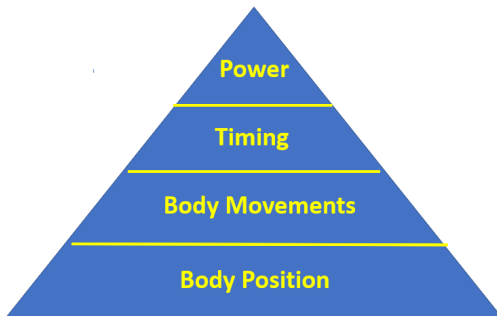
Technical Skills: The PSIA Cross Country Technical Model



Introduction

The PSIA Cross Country Technical Model can be used as a framework to organize, understand, teach and analyze the fundamentals of cross country skiing.

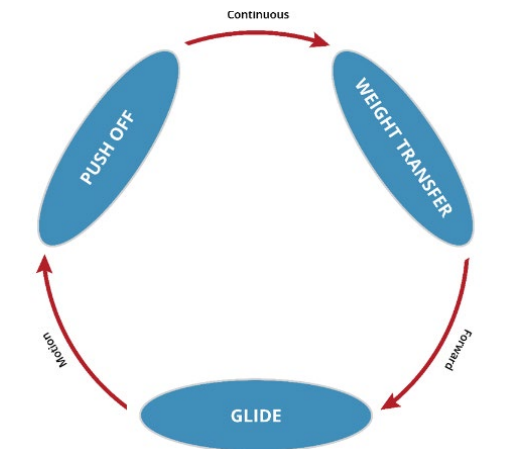
Sports Performance Pyramid



The Cross Country Technical Model has two interrelated components. At the center of the model is the Sports Performance Pyramid, which highlights the essential elements of a skier's body mechanics - body position, body movements, timing, and power.

The outer circle of the model represents the **three skills** of cross country skiing - weight transfer, push-off, and glide. These three skills blend together to produce **continuous forward motion**.

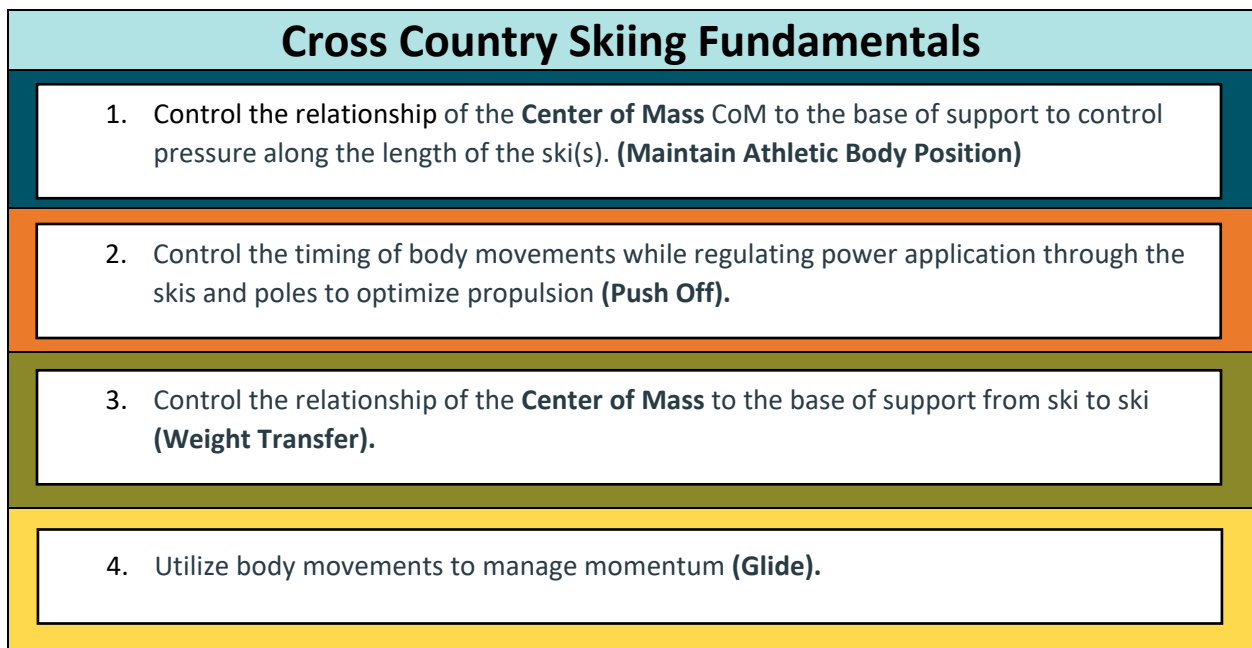
- **Push off:** Ski and pole push to create forward movement of ski.
- **Weight Transfer:** Center of Mass (CoM) moves over the base of support (fore/aft & side to side)
- **Glide:** Glide on one ski (or two skis in double pole and downhill)



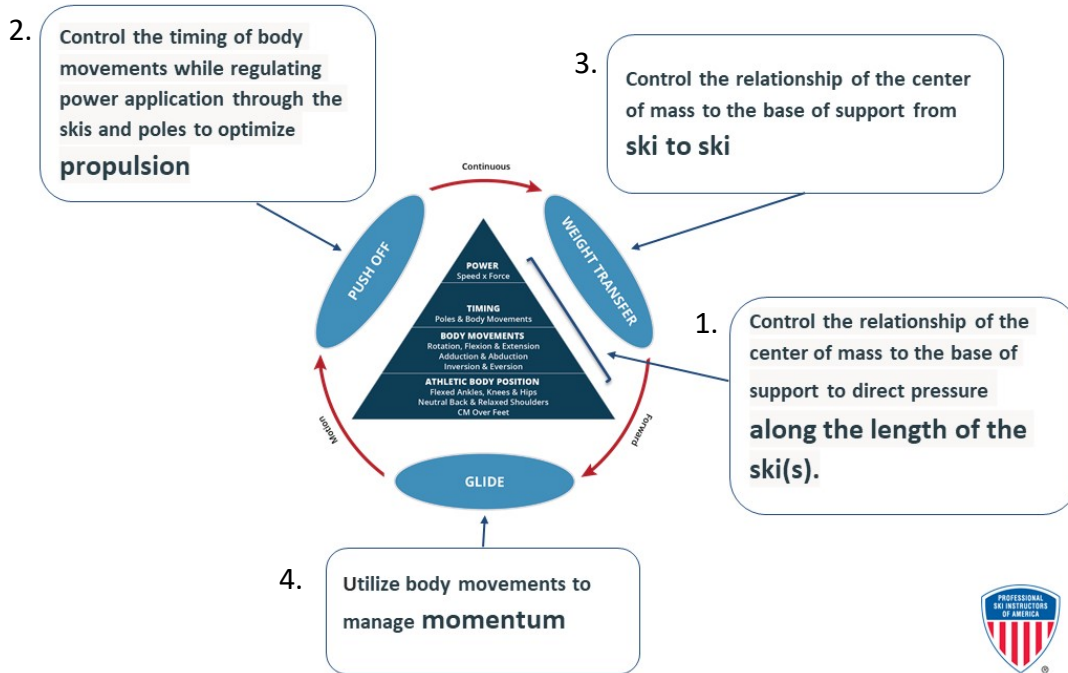
The model illustrates how a skier’s body mechanics, described by the *Sports Performance Pyramid*, connect with the three cross country skiing skills (outside circle). Skiers control body mechanics of the Sports Performance Pyramid (inner triangle) to perform the skills (outer ring) and affect ski performance.

The four fundamentals of cross country skiing are incorporated in the whole Cross Country Technical Model. A fundamental statement defines each of the three skiing skills found in the outer ring. The fourth fundamental statement relates to Athletic Body Position of the Performance Pyramid [2] (see figure below).

The **Cross Country Skiing Fundamentals** are some key statements that help us understand how Push off, Weight Transfer, and Glide ideally work together to produce Continuous Forward Motion. They are listed in the diagram below.



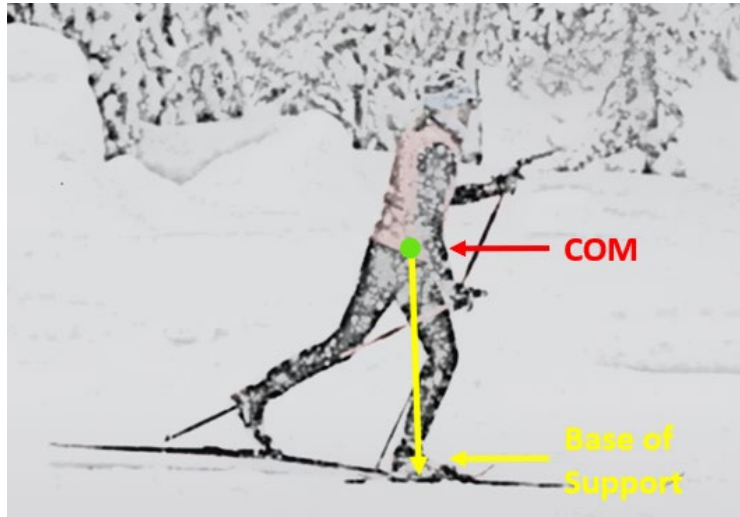
How the four XC Skiing Fundamentals enhance understanding of the Cross Country Technical Model



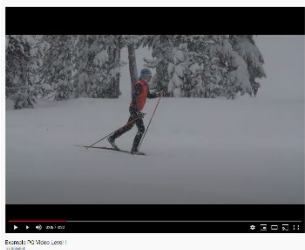
The Center of Mass -An important Visual Cue

Cross Country Skiing Fundamentals #1 and #3 deal with the skier's Center of Mass. According to the *Cross Country Technical Manual*, the Center of Mass (CoM) is "a point where the entire mass of an object can be considered to be concentrated." In a skier, it is located in the center of the body just above the pelvis when standing upright.

A very important visual cue to use when analyzing a skier's movements is to determine the relationship of the skier's CoM to his/her base of support. A person's base of support can be one ski or two skis depending on the task. In cross country skiing, ideally the center of mass is over one ski for most maneuvers. How you transfer your CoM is just as important. Study the photo below to see how the COM lines up with the base of support.

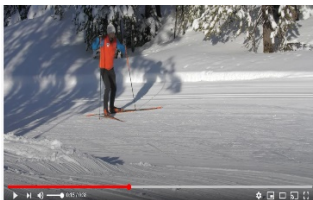


Learn to identify these skills of the classic and skate skiing cycle by watching these videos.



Ideal Level 1 Classic Skiing

https://youtu.be/_SAiv1DCR3E



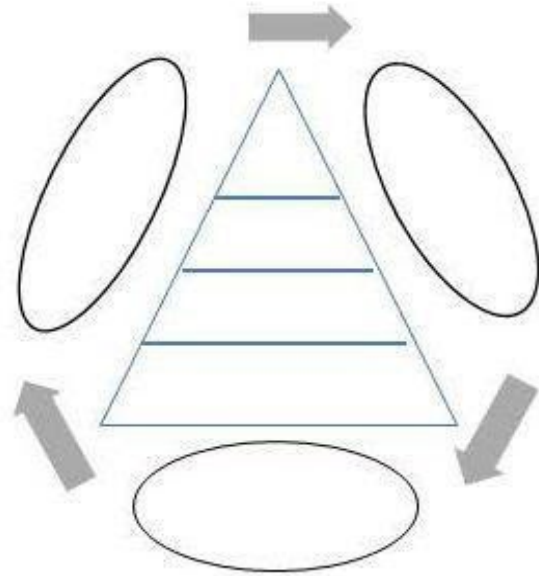
Ideal Level 1 Skate Skiing

<https://youtu.be/ETZt9Et-70Y>

Technical Skills - Quiz #2

1. The triangle is called

- a. The Learning Connection Triangle
- b. The Sports Performance Pyramid
- c. The Learner's Triangle
- d. The Bermuda Triangle



2. The outer 3 circles represent

- a. Skills
- b. Phases
- c. Cross country skiing cycle
- d. All of the above

3. In the diagram above, what do the arrows represent?

- a. Continuous forward motion
- b. Direction of travel
- c. Compass directions

Applying Cross Country Skiing Fundamental #1:

Control the relationship of the **Center of Mass** CoM to the base of support to control pressure along the length of the ski(s). **(Athletic Body Position)**



Emily

4. In this photo where is Emily's Center of Mass (CoM) in relation to her base of support?

- a. CoM over her front foot
- b. CoM over her back foot
- c. CoM centered between both feet

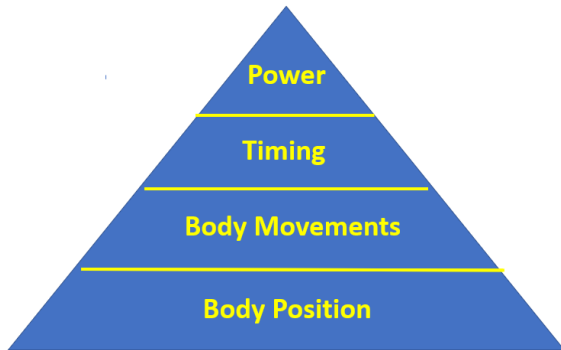


Tess

5. In this photo where is Tess's Center of Mass in relation to her base of support?

- a. CoM over her front foot
- b. CoM over her back foot
- c. CoM centered between both feet

Technical Model

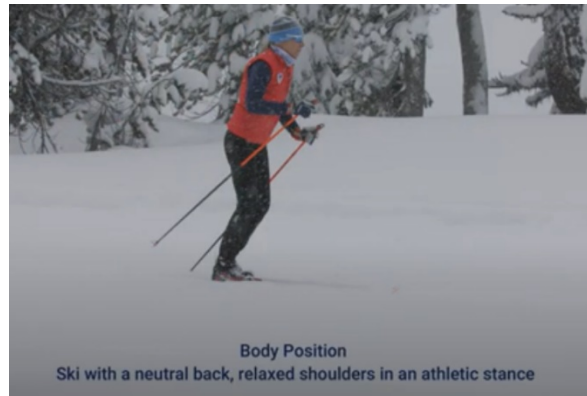


Sports Performance Pyramid

The Sports Performance Pyramid helps us describe the movements that take place during each phase of the Skiing Cycle. Beginning with an **athletic body position**, skiers **time body movements** to propel themselves forward. **Power** can best be applied to movements that are efficient and timed accurately.

Athletic Body Position

A skier positions their body such that they are continuously ready to move. The location of her COM determines this readiness. Cross Country Skiing Fundamental #1 points this out saying, “Control the relationship of the **Center of Mass (COM)** to the base of support to control pressure along the length of the ski(s).”



Sport Pyramid- Quiz #3

1. What is an athletic body position? Fill in the blanks.
 - a. Hips, knees, and ankles are _____.
 - b. Center of Mass (COM) is over the _____.
 - c. Shoulders are _____
 - d. Back is _____.
 - e. Head is up and vision is _____.

Body Movements – Flexing and Extending

Photo 1



Photo 2



2. In cross country skiing, the predominant movements are **flexing (bending)** and **extending (straightening)** ankle, knee, hip, shoulder, elbow, wrist.

Which photo shows the most leg flexing?

- A. Photo 1 B. Photo 2

3. Which photo shows the most arm extension?

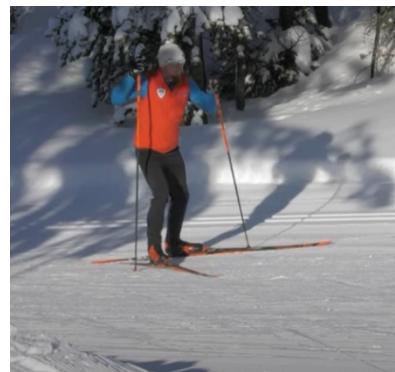
- A. Photo 1 B. Photo 2

Body Movements – Adduction/Abduction

Skier 1



Skier 2



4. In skate skiing, the legs move away from the body (abduction) and then move toward the body (adduction) predominantly from the hip joint. (See Cross Country Technical Manual p.28)

Look at the above photos. Which photo shows the most abduction:

- A. Skier 1 B. Skier 2

Body Movements – Inversion/Eversion

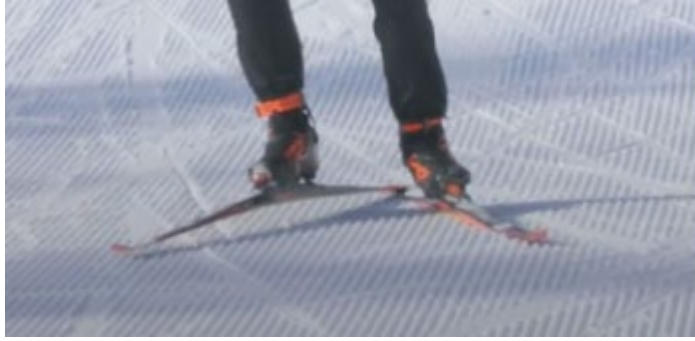


The skier can move the foot to place the ski on edge by tipping the foot toward the big toe side (eversion- which moves the ski to the inside edge) or tipping the foot toward the baby toe side (inversion- which moves the ski to the outside edge).



5. When a skier tips the foot to one side, what does that do to the ski?

- a. It puts the ski on edge
- b. It makes the ski stay flat on the snow
- c. It moves one ski ahead of the other



6. Why in skating is it important to tip the ski during the push-off phase?

- a. to create a solid base of support to extend against
- b. to look cool
- c. to be able to make your skis go into a wider V

7. All of the following are body movements except

- a. Flexion and extension
- b. adduction and abduction
- c. inversion and eversion
- d. Gliding

Timing

“The third layer of the pyramid is timing, which refers to how the movements of the body and equipment are coordinated” (CXTM p. 40) For effective skiing, some movements occur in sequence and some must occur simultaneously.

8. True or False? Correct arm timing in diagonal stride is when one arm moves forward while the other moves back.

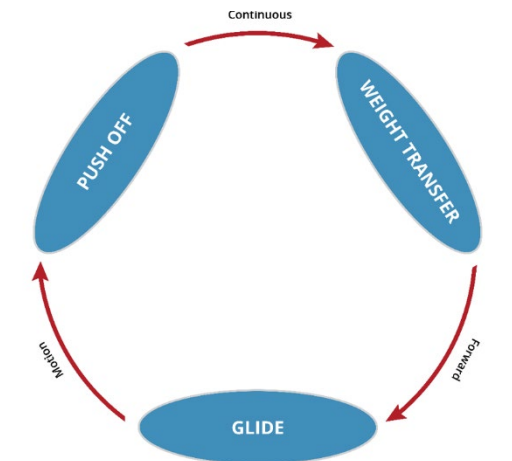
- a. False
- b. True

Power

The fourth layer of the pyramid is power, which refers to the muscular effort you exert in order to move forward faster. Body movements and timing must be working together first for power application to be effective.

9. Why do you think **power** is at the top of the Sports Performance Pyramid?
- Skiers should add power once body movements are timed correctly.
 - Skiers should apply power to overcome an ineffective technique
 - Applying power is not really important in cross country skiing
 - Not much power should be applied to body movements.

The Cross Country Skills



The Cross Country Skills- Quiz #4

1. Referring to the outer circle of the **XC technical model**, what is the overall outcome for a XC skier?
- Looking good
 - Continuous forward motion
 - Skiing fast
 - Aerobic output

Push-Off

Push Off refers to the various body movements that the skier uses to move forward. Cross Country Skiing Fundamental #2 explains that these arm and leg movements work together to propel the skier forward. In classic skiing the skier uses body movements to push the patterned area, skin, or the wax pocket under the skier’s foot into the snow.)

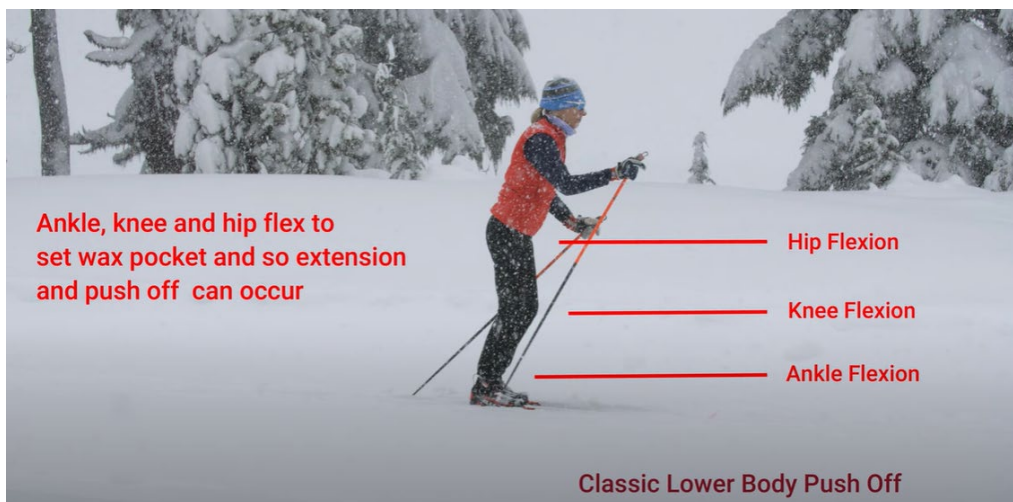
#2 Control the timing of body movements while regulating power application through the skis and poles to optimize propulsion (Push-Off).

Please watch the below video which explains the coordination of these movements during Push off.



Manage ski and pole push to create forward movement of the skier.

Skate video: <https://youtu.be/HD2dUQ4mcIE>



Classic video: <https://youtu.be/DRdM1gyOnI>

Jane



Hanz



2. Looking at the above photos, what skill of the Cross Country model are Jane and Hanz demonstrating?

- A. Push off
- B. Weight Transfer
- C. Glide
- D. Continuous Motion

3. Which skier is probably creating more forward momentum?

- A. Jane
- B. Hanz

Weight transfer

In the Cross Country Technical model, the Weight Transfer skill occurs when the skier's body mass moves from one ski to the other between Push off and Glide.



As the photo indicates, weight transfer is not partial; the skier has transferred 100% of his weight to the left ski. Please review the videos to see how weight transfers from ski to ski in Classic skiing and skate.

Classic Video <https://youtu.be/wzfQWW2m4pl>

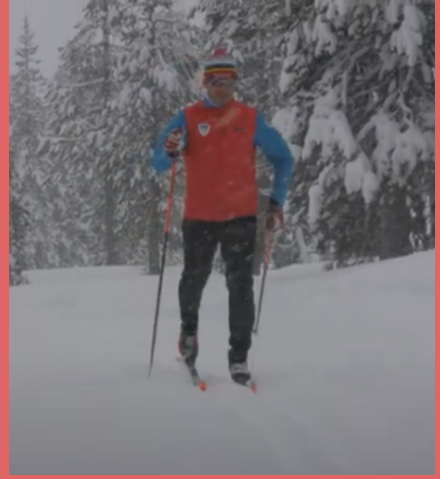


Skate Video: <https://youtu.be/3b-Xn8u10QY>

Applying Cross Country Skiing Fundamental #3 “Control the relationship of the Center of Mass to the base of support from ski to ski (Weight Transfer).”



Transferring weight from ski to ski



4. I can see full weight transfer is occurring in the photos above because...

- a. First left ski tail is off the snow, then right ski tail is off the snow.
- b. Both skis are always on the snow.
- c. Full weight transfer is not happening in these photos.
- d. Arms are swinging back and forth

5. Which photo above shows the skier is in the middle of his weight transfer?

- a. Right
- b. middle
- c. left

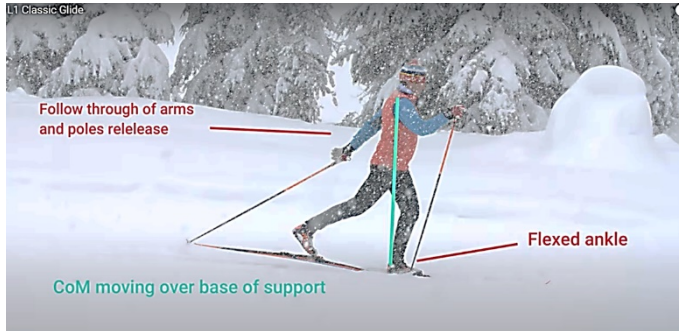
6. Which skill in the model requires the skier to balance on one ski?

- a. push-off
- b. weight transfer
- c. glide
- d. a and c

Glide

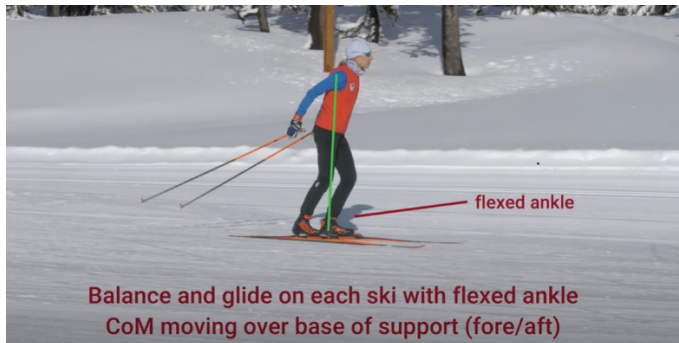
After weight transfer, the ski and skier continue to move forward due to the energy produced during push-off. The more the skier lines up his CoM over his Base of Support, the more effective the Glide.

#4 Utilize body movements to manage momentum (Glide).



Classic Video:

<https://youtu.be/mkQQHS6AHDA>



Skate Video:

<https://youtu.be/sSxRQsmQso>

Highly Recommended Practice: Apply the Cross Country Technical Model to Your Skiing

- Have someone video you from a side view for both your classic and skate skiing.
- Compare your skiing image to **the Ideal** during Push-off, Weight transfer, and Glide in terms of Athletic Body Position. What will you practice to improve your Athletic Body Position during each skill?
- What is one body movement you can change to be more efficient (ideal) in one of three XC Skiing skills? Answer for both classic and skate.

Non-Propulsive Downhill Maneuvers and Skills

The Cross Country Technical Model describes and explains how a skier creates propulsion on relatively flat terrain. However, cross country ski areas do have hills, many of which have numerous corners. Our clients need to know how to manage speed on these hills and turn while controlling speed. Thus, a Level 1 cross country instructor should be able to teach beginning clients how to ½ wedge, wedge and wedge turn. We can categorize these as “braking” downhill maneuvers because when you approach a hill and want to slow down, these are the maneuvers you would tend to use. Some concepts from the XC model are applicable to braking downhill maneuvers with some modification, but some additional skills need to be introduced. These skills are called: **Pressure Control, Rotation and Edge Control**. Pressure control is divided in three separate kinds of pressures. These pressures are tip to tail, ski to ski, and overall pressure. For level one we are only going to consider the first two.

Please view the wedge video.

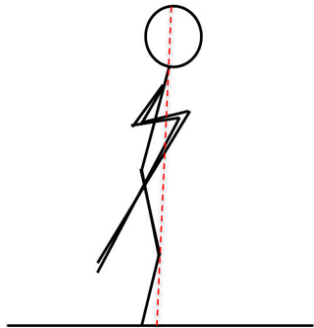
<https://3.basecamp.com/3598758/buckets/4021789/uploads/2663929054>



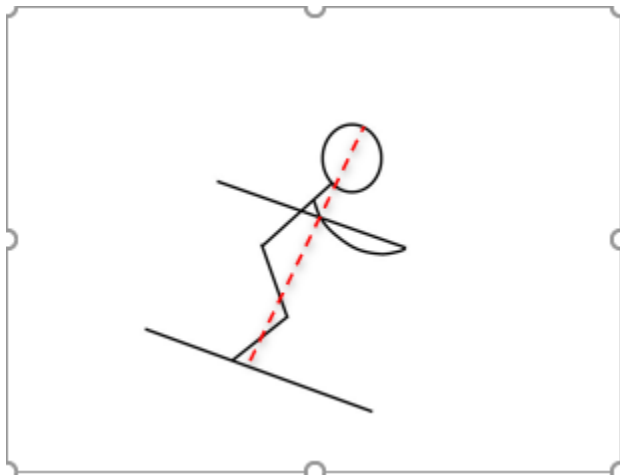
Pressure Control: A cross country skier manages two types of pressure:

- **Control of pressure from tip to tail of the ski:**

As in diagonal stride and skate techniques, the skier controls his CoM over his BoS through flexing and extending movements. In other words, he controls the distribution of pressure from tip to tail of the skis, which allows him to be perpendicular to the slope of the hill. This skill is crucial in braking downhill maneuvers to be able to maintain balance, turn the skis, and control edge angles. In the figures below, the red dotted line indicates that the body remains perpendicular to the base of support, regardless of the slope angle.



Flat Terrain

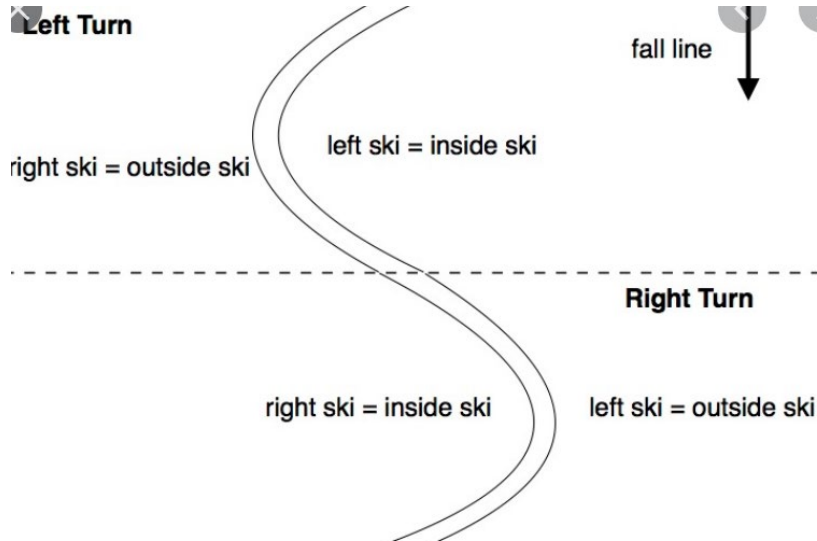


Intermediate Slope

- **Control the pressure (weight transfer) from ski to ski:**

In a straight run or wedge, the ski to ski pressure distribution is equal, that is each ski has the same amount of weight. In a turn however, the forces of the turn push the skier toward the outside of the turn, making it easier for the skier to balance on the outside ski.

Left Turn



If a turn represents a portion of a complete circle, your outside ski is the ski furthest from the center of that circle and your inside ski is the one closest to the center of the circle

Flexing and extending movements facilitate balancing with more pressure on the outside ski of the turn. In the video above, we can see that in a wedge turn both **skis remain on the snow** throughout the turn, indicating weight transfer is no

longer 100% as it is in a diagonal stride or skate. The skier is now moving a portion of his weight to the outside ski of the turn due to the effects of the forces of the turn and is able to maintain balance more effectively.

Rotation- Control the ski's rotation thru leg rotation independent of the upper body.

In the above video, the wedge position itself requires that the skier turn his skis toward each other. To do this he uses leg rotation and abduction. We can see that the skier rotates his whole body to turn the skis. While rotating the upper body to start the turn will make the skis turn, this can result in over turning the skis and over pressuring the inside ski. A more effective way to turn is for the skier to first rotate the whole leg, independent from the upper body. This leg rotation will allow the pressure to stay on the outside ski and will be more efficient since the action is closer to the skis.

Edge control-Control edge angle

A skier can keep the skis flat on the snow or tip the skis on edge by using inversion and eversion. Increasing/decreasing edge angles in combination with the size of the wedge helps the skier manage speed. The angle of the edge of the ski affects how easily the skier will be able to turn the ski. If the edge angle is high, digging into the snow, the skier will experience much more resistance to turning the ski than if the ski were less edged on the snow. Decreasing the edge angle allows the skis to steer more easily, mostly at the start of the turn. In the video the skier has some ski edge angle (big toe side) but not an extreme amount, allowing him to turn his skis more easily.

Quiz # 5

1. It is easier to turn a ski on the snow when the ski is:
 - a. Flat
 - b. On a high edge angle

2. As a skier gets more proficient at turning, they will use leg rotation to start the turn rather than upper body rotation.
 - a. True
 - b. False

3. It is better to have the weight centered right over your feet (instead of towards the tail of your skis) when turning because this will allow you to: (choose all that apply)
 - a. access your leg muscles to be able to steer your skis
 - b. be able to flatten and edge your skis more efficiently
 - c. go faster
 - d. access flexing and extending movements.
 - e. not fall as much

4. A skier when turning should balance more on the inside ski due to the effects of gravity.
 - a. True
 - b. False

5. How much a skier transfers their weight to the outside ski depends on: (Choose all that apply)
 - a. How fast the skier is going
 - b. How steep the hill is
 - c. The size of the turn
 - d. Skier's choice

The Cross Country Technical Model and Movement Analysis (MA)

Introduction:

In this section, we will cover the basics of Movement Analysis (MA) as well as the MA format to use during certifications. This MA format is a good template to use for your training, lessons, and assessments. To be able to perform MA, you must understand and be able to apply the PSIA Cross Country Technical Model and The Cross Country Certification Skiing Standards for Classic and Skate Skiing. These Standards are located in the Performance Guide.

Equipment and Movement Analysis

The first step toward a successful lesson is for our students to have the proper equipment. Many beginners come to lessons on borrowed equipment which may not be the right size, stiffness or waxed correctly.

To become familiar with the proper sizing of cross country equipment for beginners, please enroll in the free “[Delivering the Beginner Cross Country Experience](https://lms.thesnowpros.org/lms-courses/Delivering-the-Beginner-Cross-Country-Experience)” E-learning course at <https://lms.thesnowpros.org/lms-courses/> Pay special attention to the rental shop module.



Equipment- Quiz #6

1. Why do some cross country skis, called waxless skis, have patterned/fish scale/skin sections on the middle part of their bases?
 - a. For decoration
 - b. To make the ski grip the snow during push off
 - c. To make the ski go faster during glide
 - d. To slow beginners down

2. Some skiers apply different kinds of ski wax to their waxable classic skis. Which of the following statements is false?

- a. A skier should match the snow temperature to the recommended temperature range of the wax.
- b. Grip wax should be applied to the entire length of the ski.
- c. Waxes should be buffed in with a cork or a glove.
- d. Grip wax should be applied to the wax pocket.

3. All of the following are true except

- a. Skating skis and classic skis are the same lengths for a given individual.
- b. Skating poles are longer than classic poles for a given individual.
- c. Skating skis are waxed only for glide.
- d. Skating skis have greater/stiffer camber than classic skis.

4. You have a student who is classic skiing who cannot create propulsion during the push-off. This problem could be due to which of the following?

- a. Incorrect kick wax
- b. Skis that are too stiff
- c. The student is on skate skis
- d. All the above

5. Which statement is true when sizing poles for beginning students?

- a. Classic - between armpit and top of shoulder / Skate-between chin and nose
- b. Classic - between belly button and ribs / Skate-between eye and forehead
- c. Classic - between armpit and top of shoulder / Skate-between nose and eye
- d. Classic - between breast and neck / Skate-between chin and nose

Movement Analysis (MA) means analyzing the student’s body movements and how these affect their skis and poles. A successful instructor must be skilled in Movement Analysis because MA is one of the factors that determine the instructor’s on-going lesson plan. Before MA can be performed, the instructor must have in mind what Ideal skiing looks like from seeing other instructors and/or from viewing videos of Ideal skiing. Then movement analysis involves 3 basic steps, and the process looks like this:

MA Preparation: Observe and describe what the **ideal** (most efficient body movements) looks like: For example Review Level 1 classic skier video (<https://youtu.be/ETZt9Et-70Y>)

Step 1. Observe and describe the Real student-

- Observe and then, describe what you actually see in body movements and ski/pole action of your “**Real**” student.
- Compare/ contrast the **Real** of what the student is actually doing to the **Ideal**. What is the difference?

Step 2. Determine cause and effect relationships: (i.e. why the skier is making their real body movements and how those movements are impacting ski/pole performance.)

- Link body movements (cause) to ski/pole performance (effect).

Step 3. Prescription for change:

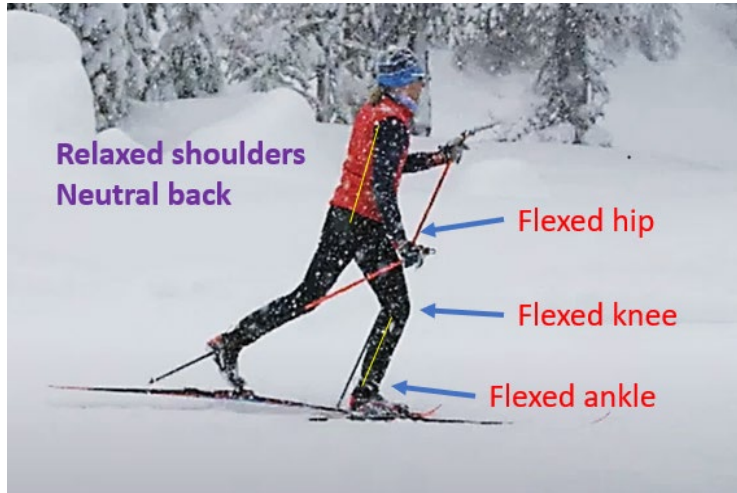
- Prescribe what the student needs to change to be more like **the Ideal**. What should the skier do (change in athletic body position or body movements) to achieve more efficient ski/pole performance?

How Movement Analysis Works, An Example

MA Preparation: Review Level 1 classic skier video <https://youtu.be/ETZt9Et-70Y> .

Choose Glide as the skill of the skiing cycle to evaluate in terms of Body position and Body movements. Observe and describe “**the Ideal**” in this video during this skill.

We will **observe** the ideal skier (Emily) by focusing our attention on her gliding skill in the following picture and use the Movement Analysis Grid to **describe** her skiing.



Movement Analysis Grid - The Ideal (Emily)

	Skills		
Elements ↓	Pushoff	WT	Glide
Skis and poles			Right ski is completely on snow, tail of left ski is off of the snow. Right ski appears to be flat on snow. Left pole is planted and the right pole is in the air.
Body position			Shoulders are relaxed. Back is neutral. CoM is over the center of the right foot. All joints are flexed except for the left hip and left knee is flexed less than the right knee.
Body Movements			Right ankle, knee, and hip are flexed more than the left ankle, knee, hip. Foot is neutral/flat and not tipped. Right shin is parallel to the torso. Left elbow is more flexed than the right elbow. Very little to no abduction/adduction, eversion/inversion or rotary movements.

Now we will complete the same MA Grid during the same skill (Glide) for the **Real** skier Jennifer.



Movement Analysis Grid for the Real (Jennifer)

Elements ↓	Phases/Skills		
	Pushoff	Weight Transfer	Glide
Skis and poles			Both skis have contact with the snow tip to tail. Both skis appear to be flat on snow. Left pole is planted. Right pole is in the air.
Athletic Body position			Right hip and knee are flexed; right ankle is in the neutral position. Left hip and ankle are extended; left knee is slightly flexed. Back is slightly arched. Shoulders not relaxed. CoM (green dot) is behind right foot
Body Movements			Left hip, knee and ankle are more extended than the right hip, knee, and ankle. Both elbows are extended. Very little to no abduction/adduction, eversion/inversion or rotary movements. Right shin and torso are not parallel.

Note: extended/un-bend/open and flexed/bend/closed can be used interchangeably

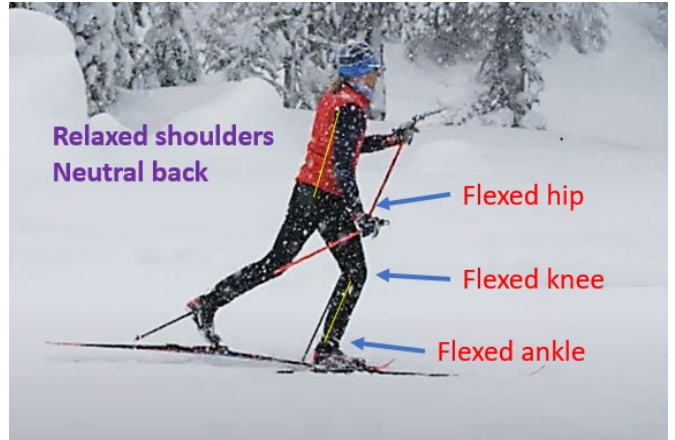
By completing the above Movement Analysis Grid, we have isolated and **described** the movements of the Ideal and the Real skiers and the movements of their equipment: the skis and poles.

Compare the Real to the Ideal- Quiz #7

Now it's your turn to make some basic observations. Use the chart below to describe each skier.



Jennifer- The Real



Emily- The Ideal

	Jennifer	Emily
<i>(First impression)</i>		
skis/poles		
CoM over foot		
Torso and shin relationship		
Front ankle/knee/hip		
back/shoulders		

Determine Cause and Effect relationships. An example of a cause and effect relationship for Jennifer is: Jennifer’s stride length is so long she cannot transfer her weight to one front ski (making it hard to flex her front ankle and extend front hip). Therefore, her CoM is behind her front foot causing her to equally weight both feet for balance, causing her glide to be short in duration.

Prescription for Change would be:

Shortening her stride length, extending her front hip joint and flexing her front ankle would enable Jennifer to keep her CoM over her front foot. With her CoM over her front foot, she would have better balance on one ski for a longer, more efficient glide.

Summary: In this example, we described movements in terms of a specific body part and a specific skill in the Cross Country Skiing Cycle, in this case, glide. The above example is offered to show the 3-step format for Movement Analysis for instructors.



Movement Analysis Practice Quiz #8

Use the Movement Analysis grid below to assess Jennifer’s “real” skiing in the Push off and Weight Transfer Phases. After reviewing Jennifer’s video, describe what you see Jennifer’s skis/poles doing, as well as her athletic body position/body movements during the skill of Push off or Weight transfer. Fill in appropriate boxes below.

<https://youtu.be/KeRiuQ5T6rE>

	Skills		
Elements ↓	Pushoff	Weight Transfer	Glide
Skis and poles			X
Body position			X
Body Movements			X

Video 1: Movement Analysis Grid-Jennifer

Teaching Skills

Snowsports Responsibility Code- Quiz #9

Below is the Snowsports Responsibility Code. Which points are relevant to XC skiing? Circle all that apply to where you teach.

- A. *Always stay in control and be able to stop or avoid other people or objects.*
- B. *People ahead of you have the right of way. It is your responsibility to avoid them.*
- C. *You must not stop where you obstruct a trail or are not visible from above.*
- D. *Whenever starting from a stopped position or merging into a trail, look both ways and yield to others.*
- E. *Always use devices to help prevent runaway equipment.*
- F. *Observe all posted signs and warnings. Keep off closed trails and out of closed areas.*
- G. *Prior to using any lift, you must have the knowledge and ability to load, ride and unload safely*

Teaching Skills

With trust established using people skills, teaching skills strengthen the connection between the instructor and student. Teaching skills create an engaging environment in which to foster student learning. To maximize learning, instructors plan, implement, and adapt the learning experience, and give students an opportunity to reflect on their experiences.

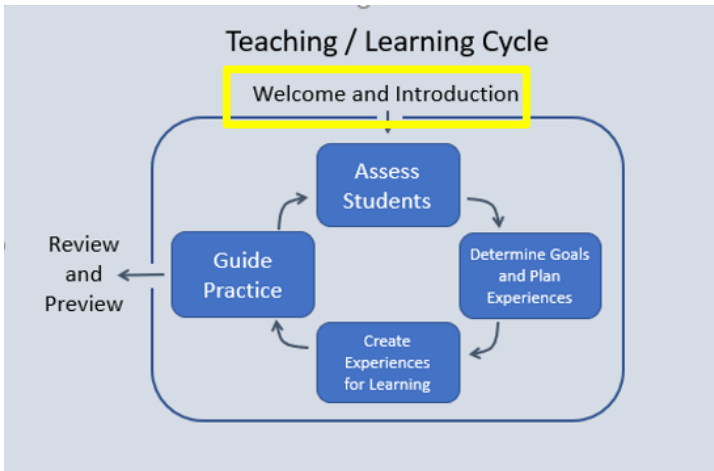
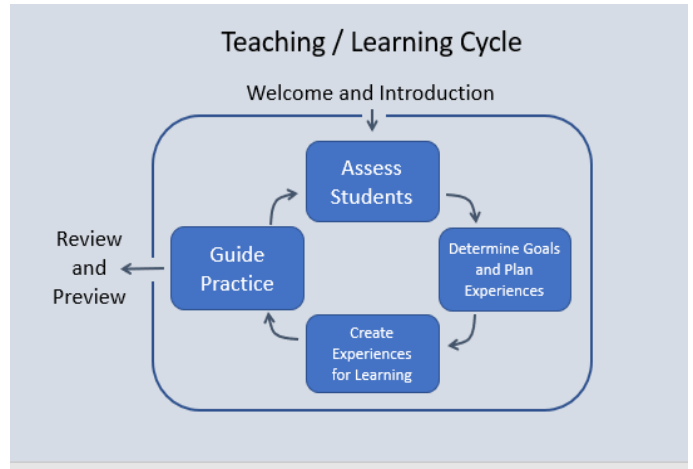
Teaching Fundamentals

- Collaborate on long-term goals and short-term objectives.
- Manage information, activities, terrain selection, and pacing.
- Promote play, experimentation, and exploration.
- Facilitate the learner's ability to reflect upon experiences and sensations.
- Adapt to the changing needs of the learner.
- Manage emotional and physical risk.

Learning Connection - Teaching/Learning Cycle

Teaching Cycle Application

In this section we will use the steps of the Teaching/Learning Cycle to plan a XC lesson with Jennifer.



Welcome and Introduction

- Be professional and proactively engage each guest.
- Introduce yourself and have your students meet each other.
- Begin to develop trust and rapport.
- Encourage a fun, open, and supportive learning environment.
- Provide a big picture overview of the lesson.

Teaching/Learning Cycle- Welcome and Introduction Quiz #10

1. How will you build a connection with Jennifer to get to know her and to gain her trust? Circle all that apply.
 - a. Ask her questions about herself.
 - b. Tell her what a great skier you are many times.
 - c. Ask her if she's excited to take a lesson.
 - d. Take off your sunglasses so you can make eye contact.

2. What do you ask your students to make sure they are prepared so they will have the stamina to make it through the lesson? Circle all that apply

- a. Did you have a good breakfast/lunch today?
- b. Do you have water with you?
- c. Did you drink too much moonshine last night?
- d. At what altitude do you live?
- e. What size shoe do you wear?

3. Your guest has a headache and feels dizzy. What do you do? Choose all that apply.

- a. Have your student take a break and sit down
- b. Suspect altitude sickness.
- c. Ask them to ski a little faster because breathing harder will help their headache.
- d. Be prepared to seek first aid assistance if your student starts to feel worse.

4. What body language cues from you will help to build Jennifer's trust?

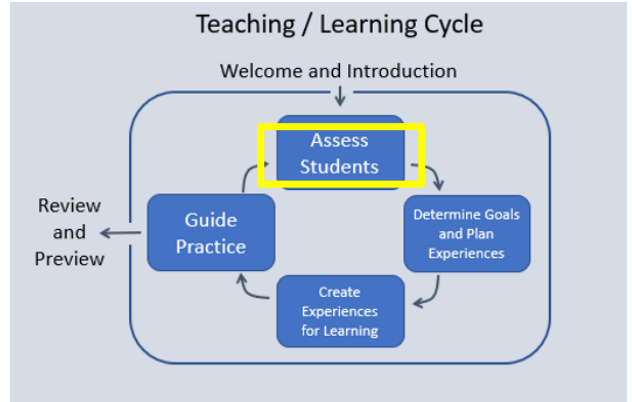
- a. Smile
- b. Eye contact
- c. Relaxed body posture
- d. All the above

5. How will you introduce the lesson? Choose all that apply.

- a. Say, if it's OK with you, I'd like to watch you ski.
- b. "Follow me" and ski down the trail because everyone learns from following.
- c. Tell her you want to hear more about her goals so you can plan a lesson for her.
- d. Describe the terrain you will be on and discuss how long the lesson will be.

Assess Students

- Notice clothing and equipment.
- Identify past experiences and personal interests.
- Identify experience with skiing, riding, and other sports.
- Recognize and respond to emotional and social behaviors.
- Explore motivations and desired outcomes for learning.
- Begin to identify learning style preferences.
- Evaluate the level of fitness and capabilities.
- Observe body movements and ski action to determine the ability level.
- Discover current understanding of the sport.



Teaching/Learning Cycle- Assess Students- Quiz #11

1. What questions would you ask Jennifer to get more information about why she is taking the lesson and how to plan the lesson? (Choose all that apply)
 - a. Why are you taking a lesson?
 - b. Have you taken XC lessons before?
 - c. What do you do for exercise/other sports?
 - d. How do you feel about physical activity?
 - e. Are you available tonight?

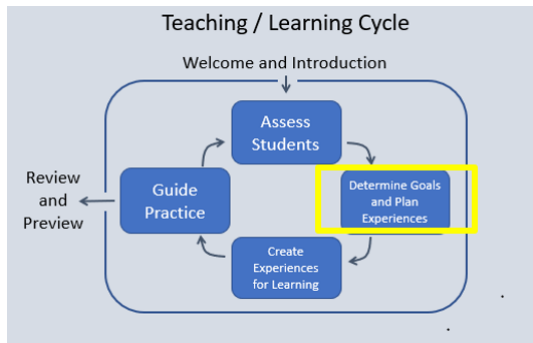
2. Functional equipment for Jennifer’s classic lesson includes: Choose all that apply.
 - A. Poles’ length are at waist level.
 - B. Bindings and boots are compatible.
 - C. She has skate skis
 - D. She has boots that hurt
 - E. Her skis have a pattern base or waxable
 - F. She has appropriate clothing for the weather conditions.

Important background information that you learned from Jennifer including her goals for taking this lesson:

You interview Jennifer and you find out that she is 22 years old, average fitness, and she wants to be able to ski as efficiently as possible. She is confident and loves to move. Jennifer has skied 5 times, and this is her first lesson on classic gear. Later this winter she is planning a multi-day backcountry hut trip and is worrying about falling (since she will have a backpack on) and keeping up with her fellow skiers. Jennifer owns and knows how to put on her equipment.

Assess Student- Observing body movements to determining ability level (See MA analysis above.). We have already analyzed Jennifer’s skiing in a previous section using the Movement Analysis Grid.

Determine goals and plan experiences-



- Identify big-picture goals.
- Suggest an initial focus for the group.
- Work together to establish specific objectives.
- Partner with students to plan purposeful experiences.
- Check for understanding of goals and objectives.

A. Determine goals and plan experiences:

Prescription for Change: The Prescription for Change that we determined previously was: *Shortening her stride length, extending her front hip joint and flexing her front ankle would enable Jennifer to keep her CoM over her front foot. With her CoM over her front foot, she would have better balance on one ski for more efficient and longer glide.*

Teaching/Learning Cycle- Determine Goals and Plan Experiences-Quiz #12

1. You have interviewed Jennifer and watched her ski. You know why she is taking a lesson and you see what you would change in her skiing. How would you work with her to come up with a plan for the lesson in order to reach her goals? (Circle all that apply)

- a. Ask her if she knows how she likes to learn i.e. hear instructions, watch demonstration, just try it? Other?
- b. She says she wants to ski more efficiently. Ask her what that might feel like to her?
- c. Tell her what she needs to do regardless of what she wants to do.
- d. Tell her you will teach her the lesson that you always teach beginners.
- e. Ask about her backcountry hut trip so you can direct some of the lesson toward that adventure.



2. You have identified and described Jennifer’s “real” body position in all 3 skills in the Movement Analysis grid above. Choose all the answers that best describe Jennifer’s “real” body position in Glide.

- a. CoM is over her front/gliding foot
- b. Front ankle is neutral
- c. Right hip is flexed
- d. Back is slightly arched, and the shoulders are not relaxed. Rear knee is slightly extended

3. Next, describe the “ideal” body position that you would like to see in Jennifer’s skiing in that same skill.

(Choose 3)

- a. CoM is over her front/gliding foot
- b. Front leg is flexed at ankle, knee and hip
- c. Back is neutral and shoulders are relaxed
- d. Whole Front leg is straight

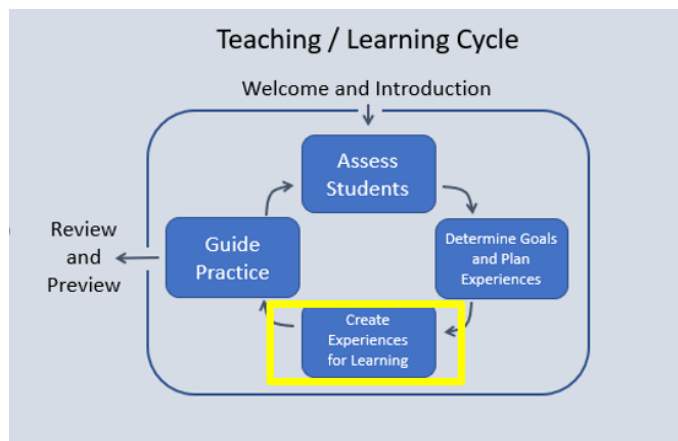
4. How will changing Jennifer’s body position cause the skis and Jennifer to move more efficiently (the effect)?

Choose all that apply.

- a. Ski will glide for a longer distance
- b. It will be easier for Jennifer to balance over her gliding ski.
- c. It will put her skis on a very high edge angle.
- d. She will have to get shorter poles to move her arms faster.

5. Explain how your above cause and effect relationship (or prescription for change) will help Jennifer reach her goals. Choose all that apply.

- a. She will look better on her skis and can find a date.
- b. She will be more efficient, so she can ski for longer and faster.
- c. If she is carrying a pack, she will be better balanced, and less likely to fall.
- d. She will be able to ski black runs at her favorite XC area.



Create Experiences for Learning

- Organize students and the lesson environment.
- Choose appropriate terrain and snow conditions.
- Use experiences to target change in performance and understanding.
- Engage students in a process of reflection.

- Introduce new experiences and information based on student readiness.
- Provide descriptive instruction that’s easy to understand.
- Promote group engagement, interaction, and support.

Teaching/Learning Cycle- Create Experiences for Learning-Quiz #13

1. How will you present and share information in a way that addresses how Jennifer learns.
 - a. Show her what you would like her to do.
 - b. Explain what you would like her to do.
 - c. Have her experience it, by doing and feeling it.
 - d. All the above

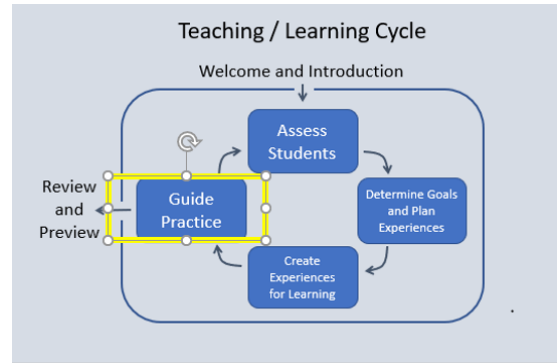
2. Jennifer is part of a class of 8 students. How will you organize your class so that they can see and hear you? Choose all that apply.
 - a. Put four students on either side of the track and ski your demonstration between them.
 - b. Always have them do each activity one at a time.
 - c. Be close enough so students can hear you and you can see their faces.
 - d. Have students follow you with the fastest ones always directly behind you.

3. While teaching how to balance on one ski, you see that some of your students are slipping backwards and tripping over each other's skis. This is happening because you forgot to...
 - a. Make sure that your students are properly spaced
 - b. Check their poles before the lesson.
 - c. Take into account small terrain variations in an overall "flat teaching area."
 - d. a and c.

4. You can promote group interaction and support by: Choose all that apply
 - a. Making a fun game to help students learn each other's names.
 - b. Design a team based exercise to get students cheering for each other.
 - c. Directing most of your instruction to the slow students.
 - d. Talking mostly to the students who you think will give you a good tip.

Guide practice

- Select appropriate terrain and conditions.
- Select appropriate activities, games, drills, and exercises.
- Continually check for understanding and modify practice as needed.
- Encourage reflective proactive and self-coaching.
- Provide specific, timely feedback.
- Focus on tactics and technique.



Teaching/Learning Cycle- Guide Practice- Quiz #14

1. How will you **deliver objective feedback** to Jennifer? Choose all that apply.
 - a. Jennifer, what you are doing wrong is.....
 - b. Jennifer, you need to stop having your CoM behind your base of support.
 - c. Jennifer, it looks like you really like to glide on your skis. Let's try to make that glide even better.
 - d. Jennifer, do you think that when you glide that you are balanced over one foot or more on both feet? (Getting her to reflect on her movements.)
 - e. Jennifer, when you ski, I can see that your front ankle is flexed at 90 degrees and both your skis are always on the snow. Jennifer can you feel that.

2. How will you set-up practice for Jennifer? (Choose all that apply.)
 - a. Jennifer would like to practice skiing downhill: practice on a slight, short downhill first.
 - b. Ski in straight lanes in the teaching area until you run out of lesson time.
 - c. Show her each step in your progression, then explain it, and then you have her practice it.
 - d. Have Jennifer imitate your movements as she skis behind you.
 - e. For a few minutes, have Jennifer ski without poles in the teaching lanes.

3. Guiding Practice Matching- Choose the item in column B that supports the item in column A.

Column A	Column B
<p>A. Make a game to help her explore a range of movement options where her CoM is in front of, over and behind her base of support.</p> <p>B. Spend half of the lesson in the teaching area and the other half on an easy trail because one of her goals is to learn about the trail system.</p> <p>C. Ask Jennifer if she feels like her practice matches what you asked her to do, and would she like to keep practicing or rest?</p> <p>D. You are now flexing your front ankle to almost 45 degrees at least 75% of time, at the beginning of push-off. Nice!!!</p> <p>E. Jennifer can you feel how you shortened your stride when the hill got steeper? Well done!!!!</p>	<ol style="list-style-type: none"> 1. Select appropriate terrain and conditions. 2. Select appropriate activities, games, drills, and exercises. 3. Continually check for understanding and modify practice as needed. 4. Provide specific, timely feedback. 5. Focus on tactics and technique.

Developing Progressions

According to the PSIA-AASI Snowsports manual, progressions are activities and movements in a sequence that start simply, then increase in complexity and are then applied back into personal skiing. A formula for composing a progression is “Static-Simple-Complex-Apply.” For example:

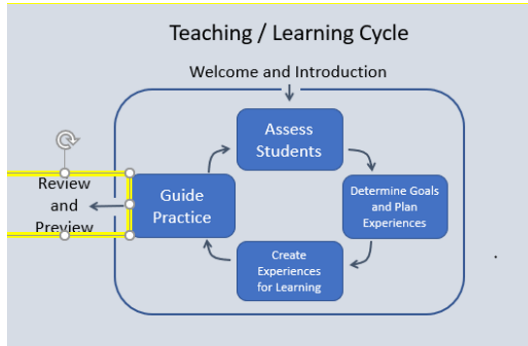
Focus/ Skill	Drill / Explanation / Maneuver	Terrain Description	Time (i.e. 12 min)
Body Position/Glide	With skis off, balance on one foot at a time-- vary the amount of flex in the ankle/knee/hips. (Static)	flat, terrain	5
Body Position/Glide	With skis on, balance on one ski at a time in place--varying the amount of flex in the ankle/knee/hips. The student identifies how much flexing works most efficiently. (Simple)	in tracks- flat	10
Body Position/Glide	Balance on one foot at a time while gliding down a slight hill. Vary amount of flex in the ankle/knee/hips. Switch to the other foot. The student identifies how much flexing works most efficiently. (Complex)	in tracks-slight downhill	10
Body Position/Glide	Student applies the most effective flex to their free skiing during glide. (Apply)	in tracks-slight downhill	As long as she wants to.

4. Use the chart below to plan a short progression that meets Jennifer’s goals. Choose to Focus on either Body Position or Body Movement during Push off or Weight Transfer.

Focus/ Skill	Drill / Explanation / Maneuver	Terrain Description	Time (i.e. 12 min)

5. What can you, as an instructor, do to determine that Jennifer understands how to get her center of Mass over her Base of Support? Choose all that apply.

- a. Ask Jennifer “When do you feel most balanced?”
- b. Jennifer says, “I feel like I can glide forever.”
- c. Jennifer says she is having fun.
- d. You can see Jennifer’s front ankle is more flexed during her glide and her glide is longer.



Review and Preview

- Review progress and establish a plan for independent practice.
- Preview future learning outcomes and invite students to return.

It is critical to allow time to debrief the Learning Experience.

Teaching/Learning Cycle- Review and Preview Quiz #15

- How will you review the lesson with Jennifer? Circle all that apply.
 - Specifically tell Jennifer all the movements she did wrong during the lesson.
 - Ask Jennifer “Can you tell me what we covered during our lesson?”
 - Ask Jennifer “Do you have any questions about our lesson?”
 - Ask Jennifer “What was your biggest take away of the lesson and why?”
 - Tell Jennifer what you covered today and exactly what she learned.
 - Ask Jennifer “were her goals were met today”. If yes, ask her how? If not, why not?
 - Say, “Jennifer, now let’s establish a plan so you can practice on your own when you are not taking a lesson.”
- How will you encourage Jennifer to come back to ski with you again? Circle all that apply.
 - Mention to Jennifer “I really enjoyed skiing with you. Here is my business card, I would be delighted to ski with you again.”
 - Casually say “Were you thinking about taking another lesson?”
 - You say, “Jennifer, you said that a big part of your future backcountry hut trip is climbing hills. If you come back, we can work on uphill techniques.”
 - Mention to Jennifer to please come back, because you're broke and need to teach to make some money.



For **OPTIONAL** additional movement analysis practice, view another video from the PSIA-RM Movement Analysis videos. After you click on the link, select Level 1 skate skier named Chuck. A Movement Analysis grid is included below for your convenience.

<https://www.psia-rm.org/education/cross-country/#1540172379518-dee53537-2d90>

	Phases/Skills/Fundamentals		
Elements ↓	Push-off	Weight Transfer	Glide
Skis and poles			
Body position			
Body Movements			

Remember to complete your MA by:

- Contrasting Chuck’s real body position/body movements to the ideal.
- Determining Cause and effect relationships for Chuck.
- Prescribing a change for Chuck.

Skiing Skills-this section is still being worked on

Below is a list of techniques that you may be asked to perform at your Level 1 certification. While you are skiing these techniques, you will be assessed on your ability to demonstrate **the skills of push-off, weight transfer, and glide while maintaining CoM over the base of support.** (Note: that in the 2021-2022 season this section will reference the Performance Guide)

- Diagonal stride-[view](#)
- Herringbone-[view](#)
- Double Pole-[view](#)
- Marathon Skate- [view](#)
- V2 skate-[view](#)
- V2A skate-[view](#)
- V1 Skate-[view](#)
- Step turn- [view](#) (moved up from below)

Below is a list of downhill maneuvers (braking) that you may be asked to perform at your Level 1 certification. While you are skiing these techniques, you will be assessed on your ability to demonstrate rotation, edging control, and pressure control movements.

½ Wedge - [view](#)

wedge-[view](#)

Wedge Turn- [L1_wedge turn-front_lovett.MOV](#) Technique:
DownhillsManeuver: stem/wedge turn Cert Level: L1 or L2 Shot angle: front/head-on Skier: Emily Lovett File # P1088094 May 18 May 11

For more details on how you will be assessed during your certification event refer to the Level 1 assessment form for your division. (note: In the 2021-2022 season the Performance Guide will accompany the assessment form)

Now APPLY what you learned from this workbook to a real lesson!

- When you are teaching a XC lesson, video your students.
- Then sometime later (or even better during the lesson if appropriate), practice this Movement Analysis process.
- Then reflect on your lesson: Were you able to cover all sections of the learning/teaching cycle? Was the lesson successful? What would you have done differently?

Thank you for participating in the PSIA Level 1 Cross Country certification program. It is our hope that this process has stimulated your thinking and your desire to be the best instructor you can be. In a like manner, we are constantly striving to improve our educational programs and materials. Please feel free to contact the email addresses below with your feedback and suggestions.

- For specific comments or questions regarding this workbook contact RM Cross Country Education Staff and authors: Dale Drennan; d2skier@sbcglobal.net or Deb Willits; debski79@gmail.com or Patti Banks; patebanks@yahoo.com

Cross Country Level 1 Answer Form

This is the answer form for the Cross Country Level 1 workbook. After going through the workbook above please answer the questions on this answer form. This is a fillable PDF, which means you can type and complete fields on this PDF. Please bring the answer form to your assessment.

Name:

Email:

Snowsports School:

Event Location:

Event Date(s):

Course Content – All Quizzes highlighted in blue

The Learning Connection

People Skills

- People Skill- Quiz #1

Technical Skills

- Technical Model-Quiz #2
- Sports Pyramid Quiz #3
- Cross Country Skills Quiz #4
- Braking Downhill Maneuvers quiz #5
- Equipment Quiz #6
- Compare the Real to the Ideal- Quiz #7
- Movement Analysis Practice- Quiz #8

Teaching Skills

- Snowsports Responsibility Code- Quiz #9
- The Teaching Model Teaching/Learning Cycle- Welcome and Introduction Quiz #10
- Teaching/Learning Cycle- Assess Students Quiz #11
- Teaching/Learning Cycle- Determine Goals and Plan Experiences-Quiz #12
- Teaching/Learning Cycle- Create Experiences for Learning- Quiz #13
- Teaching/Learning Cycle- Guide Practice- Quiz #14
- Teaching/Learning Cycle- Review and Preview- Quiz #15

People Skills-Quiz #1

1. The student is the center of the Learning Connection Model because

- a. The student follows the instructor's lesson plan
- b. It makes a nice picture
- c. The student's goals and abilities determine the lesson plan.

2. When we first introduce ourselves to our students, we should always spend at least 5 minutes explaining our qualifications as an instructor before doing anything else.

- a. True
- b. False

3. The most important feeling that students can have toward their instructor is

- a. friendship
- b. respect
- c. trust
- d. admiration

4. Two-way communication involves

- a. Listening
- b. Asking questions
- c. Observing non-verbal cues
- d. All of the above

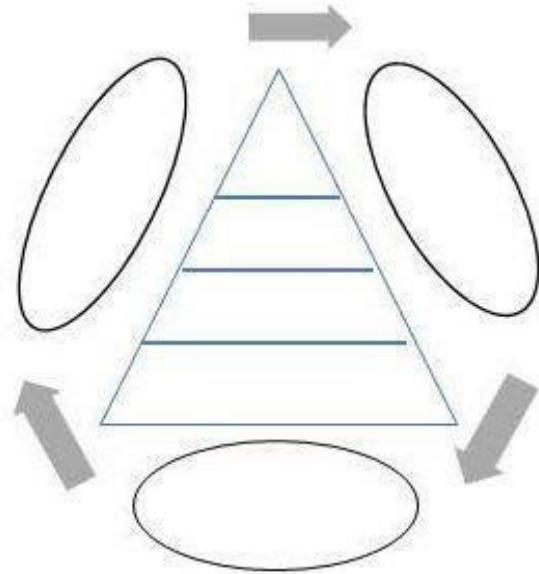
5. You have a student that complains about everything. You realize that you really do not like this person so you...

- a. Try to find the source of their complaints and proceed with teaching the lesson
- b. Ask one of your fellow instructors to take this student
- c. Tell this student they are wrong for complaining so much
- d. Pay more attention to the other students in your class

Technical Model-Quiz #2

1. The triangle is called

- a. The Learning Connection Triangle
- b. The Sports Performance Pyramid
- c. The Learner's Triangle
- d. The Bermuda Triangle



2. The outer 3 circles represent

- a. Skills
- b. Phases
- c. Cross country skiing cycle
- d. All of the above

3. In the diagram above, what do the arrows represent?

- a. Continuous forward motion
- b. Direction of travel
- c. Compass directions

Applying Cross Country Skiing Fundamental #1:

Control the relationship of the **Center of Mass CoM** to the base of support to control pressure along the length of the ski(s). **(Athletic Body Position)**



Emily

4. In this photo where is Emily's Center of Mass (CoM) in relation to her base of support?

- a. CoM over her front foot
- b. CoM over her back foot
- c. CoM centered between both feet



Tess

5. In this photo where is Tess's Center of Mass in relation to her base of support?

- a. CoM over her front foot
- b. CoM over her back foot
- c. CoM centered between both feet

Sport Pyramid- Quiz #3

1. What is an athletic body position? Fill in the blanks.

- a. Hips, knees, and ankles are _____.
- b. Center of Mass (COM) is over the _____.
- c. Shoulders are _____
- d. Back is _____.
- e. Head is up and vision is _____.

Body Movements – Flexing and Extending

Photo 1



Photo 2



2. In cross country skiing, the predominant movements are **flexing (bending)** and **extending (straightening)** ankle, knee, hip, shoulder, elbow, wrist.

Which photo shows the most leg flexing?

- A. Photo 1
- B. Photo 2

3. Which photo shows the most arm extension?

- A. Photo 1
- B. Photo 2

Body Movements – Adduction/Abduction

Skier 1



Skier 2



4. In skate skiing, the legs move away from the body (abduction) and then move toward the body (adduction) predominantly from the hip joint. (See Cross Country Technical Manual p.28)

Look at the above photos. Which photo shows the most abduction:

- A. Skier 1 B. Skier 2

5. When a skier tips the foot to one side, what does that do to the ski?

- a. It puts the ski on edge
- b. It makes the ski stay flat on the snow
- c. It moves one ski ahead of the other

6. Why in skating is it important to tip the ski during the push-off phase?

- a. to create a solid base of support to extend against
- b. to look cool
- c. to be able to make your skis go into a wider V

7. All of the following are body movements except

- a. Flexion and extension
- b. adduction and abduction
- c. inversion and eversion
- d. Gliding

8. True or False? Correct arm timing in diagonal stride is when one arm moves forward while the other moves back.

- a. False
- b. True

9. Why do you think **power** is at the top of the Sports Performance Pyramid?

- a. Skiers should add power once body movements are timed correctly.
- b. Skiers should apply power to overcome an ineffective technique
- c. Applying power is not really important in cross country skiing
- d. Not much power should be applied to body movements.

The Cross Country Skills- Quiz #4

1. Referring to the outer circle of the **XC technical model**, what is the overall outcome for a XC skier?
 - a. Looking good
 - b. Continuous forward motion
 - c. Skiing fast
 - d. Aerobic output

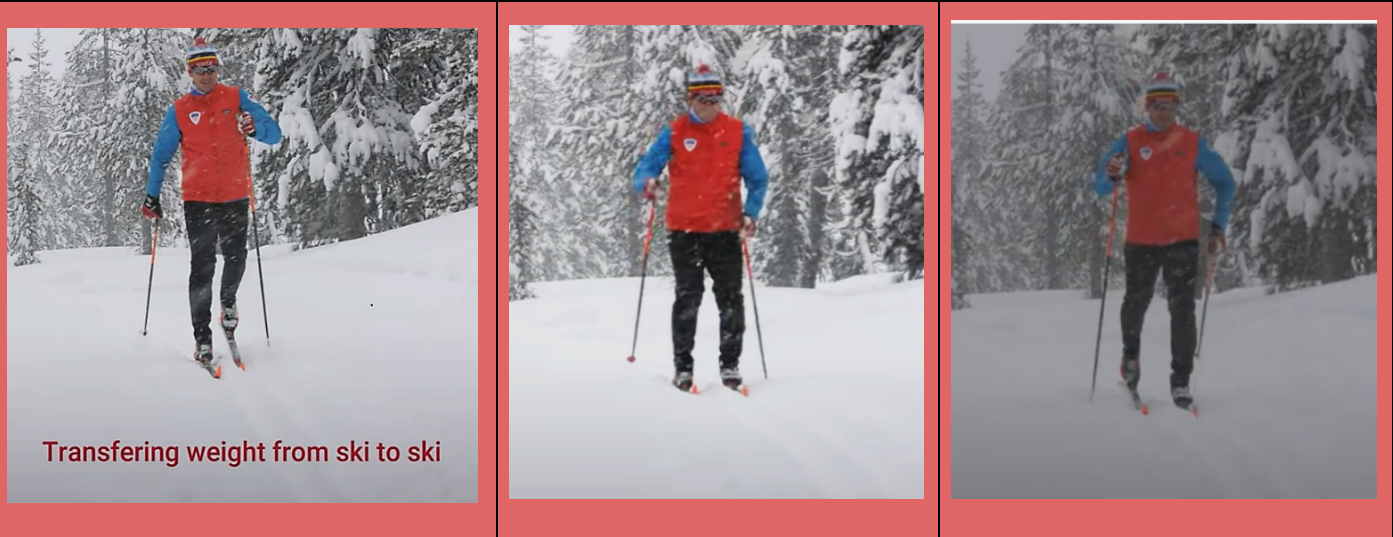
Jane



Hanz



2. Looking at the above photos, what skill of the Cross Country model are Jane and Hanz demonstrating?
 - A. Push off
 - B. Weight Transfer
 - C. Glide
 - D. Continuous Motion
3. Which skier is probably creating more forward momentum?
 - A. Jane
 - B. Hanz



4. I can see full weight transfer is occurring in the photos above because...
- a. First left ski tail is off the snow, then right ski tail is off the snow.
 - b. Both skis are always on the snow.
 - c. Full weight transfer is not happening in these photos.
 - d. Arms are swinging back and forth
5. Which photo above shows the skier is in the middle of his weight transfer?
- a. Right
 - b. middle
 - c. left
6. Which skill in the model requires the skier to balance on one ski?
- a. push-off
 - b. weight transfer
 - c. glide
 - d. a and c

Braking Downhill Maneuvers quiz #5

1. It is easier to turn a ski on the snow when the ski is:
 - a. Flat
 - b. On a high edge angle

2. As a skier gets more proficient at turning, they will use leg rotation to start the turn rather than upper body rotation.
 - a. True
 - b. False

3. It is better to have the weight centered right over your feet (instead of towards the tail of your skis) when turning because this will allow you to: (choose all that apply)
 - a. access your leg muscles to be able to steer your skis
 - b. be able to flatten and edge your skis more efficiently
 - c. go faster
 - d. access flexing and extending movements.
 - e. not fall as much

4. A skier when turning should balance more on the inside ski due to the effects of gravity.
 - a. True
 - b. False

5. How much a skier transfers their weight to the outside ski depends on: (Choose all that apply)
 - a. How fast the skier is going
 - b. How steep the hill is
 - c. The size of the turn

Equipment- Quiz #6

1. Why do some cross country skis, called waxless skis, have patterned/fish scale/skin sections on the middle part of their bases?

- a. For decoration
- b. To make the ski grip the snow during push off
- c. To make the ski go faster during glide
- d. To slow beginners down

2. Some skiers apply different kinds of ski wax to their waxable classic skis. Which of the following statements is false?

- a. A skier should match the snow temperature to the recommended temperature range of the wax.
- b. Grip wax should be applied to the entire length of the ski.
- c. Waxes should be buffed in with a cork or a glove.
- d. Grip wax should be applied to the wax pocket.

3. All of the following are true except

- a. Skating skis and classic skis are the same lengths for a given individual.
- b. Skating poles are longer than classic poles for a given individual.
- c. Skating skis are waxed only for glide.
- d. Skating skis have greater/stiffer camber than classic skis.

4. You have a student who is classic skiing who cannot create propulsion during the push-off. This problem could be due to which of the following?

- a. Incorrect kick wax
- b. Skis that are too stiff
- c. The student is on skate skis
- d. All the above

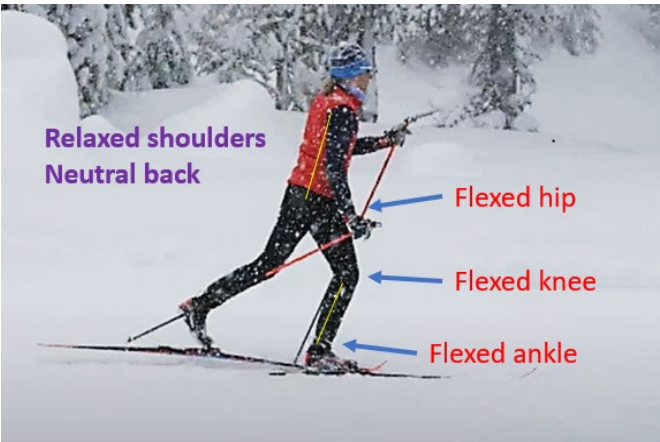
5. Which statement is true when sizing poles for beginning students?
- a. Classic - between armpit and top of shoulder / Skate-between chin and nose
 - b. Classic - between belly button and ribs / Skate-between eye and forehead
 - c. Classic - between armpit and top of shoulder / Skate-between nose and eye
 - d. Classic - between breast and neck / Skate-between chin and nose

Compare the Real to the Ideal- Quiz #7

Now it's your turn to make some basic observations. Use the chart below to describe each skier.



Jennifer- The Real



Emily- The Ideal

	Jennifer	Emily
<i>(First impression)</i>		
skis/poles		
CoM over foot		
Torso and shin relationship		

Front ankle/knee/hip		
back/shoulders		



Movement Analysis Practice Quiz #8

Use the Movement Analysis grid below to assess Jennifer’s “real” skiing in the Push off and Weight Transfer Phases. After reviewing Jennifer’s video, describe what you see Jennifer’s skis/poles doing, as well as her athletic body position/body movements during the skill of Push off or Weight transfer. Fill in appropriate boxes below.

<https://youtu.be/KeRiuQ5T6rE>

	Skills		
Elements ↓	Pushoff	Weight Transfer	Glide
Skis and poles			X
Body position			X
Body Movements			X

Video 1: Movement Analysis Grid-Jennifer

Snowsports Responsibility Code- Quiz #9

Below is the Snowsports Responsibility Code. Which points are relevant to XC skiing? Check all that apply to where you teach.

- A. *Always stay in control and be able to stop or avoid other people or objects.*
- B. *People ahead of you have the right of way. It is your responsibility to avoid them.*
- C. *You must not stop where you obstruct a trail or are not visible from above.*
- D. *Whenever starting from a stopped position or merging into a trail, look both ways and yield to others.*
- E. *Always use devices to help prevent runaway equipment.*
- F. *Observe all posted signs and warnings. Keep off closed trails and out of closed areas.*
- G. *Prior to using any lift, you must have the knowledge and ability to load, ride and unload safely*

Teaching/Learning Cycle- Welcome and Introduction Quiz #10

1. How will you build a connection with Jennifer to get to know her and to gain her trust? Check all that apply.
 - a. Ask her questions about herself.
 - b. Tell her what a great skier you are many times.
 - c. Ask her if she's excited to take a lesson.
 - d. Take off your sunglasses so you can make eye contact.

2. What do you ask your students to make sure they are prepared so they will have the stamina to make it through the lesson? Check all that apply
 - a. Did you have a good breakfast/lunch today?
 - b. Do you have water with you?
 - c. Did you drink too much moonshine last night?
 - d. At what altitude do you live?
 - e. What size shoe do you wear?

3. Your guest has a headache and feels dizzy. What do you do? Choose all that apply.
- a. Have your student take a break and sit down
 - b. Suspect altitude sickness.
 - c. Ask them to ski a little faster because breathing harder will help their headache.
 - d. Be prepared to seek first aid assistance if your student starts to feel worse.
4. What body language cues from you will help to build Jennifer's trust?
- a. Smile
 - b. Eye contact
 - c. Relaxed body posture
 - d. All the above
5. How will you introduce the lesson? Choose all that apply.
- a. Say, if it's OK with you, I'd like to watch you ski.
 - b. "Follow me" and ski down the trail because everyone learns from following.
 - c. Tell her you want to hear more about her goals so you can plan a lesson for her.
 - d. Describe the terrain you will be on and discuss how long the lesson will be.

Teaching/Learning Cycle- Assess Students- Quiz #11

1. What questions would you ask Jennifer to get more information about why she is taking the lesson and how to plan the lesson? (Choose all that apply)
- a. Why are you taking a lesson?
 - b. Have you taken XC lessons before?
 - c. What do you do for exercise/other sports?
 - d. How do you feel about physical activity?
 - e. Are you available tonight?

2. Functional equipment for Jennifer’s classic lesson includes: Choose all that apply.

- A. Poles’ length are at waist level.
- B. Bindings and boots are compatible.
- C. She has skate skis
- D. She has boots that hurt
- E. Her skis have a pattern base or waxable
- F. She has appropriate clothing for the weather conditions.

Teaching/Learning Cycle- Determine Goals and Plan Experiences-Quiz #12

1. You have interviewed Jennifer and watched her ski. You know why she is taking a lesson and you see what you would change in her skiing. How would you work with her to come up with a plan for the lesson in order to reach her goals? (Check all that apply)

- a. Ask her if she knows how she likes to learn i.e. hear instructions, watch demonstration, just try it? Other?
- b. She says she wants to ski more efficiently. Ask her what that might feel like to her?
- c. Tell her what she needs to do regardless of what she wants to do.
- d. Tell her you will teach her the lesson that you always teach beginners.
- e. Ask about her backcountry hut trip so you can direct some of the lesson toward that adventure.



2. You have identified and described Jennifer’s “real” body position in all 3 skills in the Movement Analysis grid above. Choose all the answers that best describe Jennifer’s “real” body position in Glide.

- a. CoM is over her front/gliding foot
- b. Front ankle is neutral
- c. Right hip is flexed
- d. Back is slightly arched, and the shoulders are not relaxed.
- Rear knee is slightly extended

3. Next, describe the “ideal” body position that you would like to see in Jennifer’s skiing in that same skill. (Choose 3 answers)

- a. CoM is over her front/gliding foot
- b. Front leg is flexed at ankle, knee and hip
- c. Back is neutral and shoulders are relaxed
- d. Whole Front leg is straight

4. How will changing Jennifer’s body position cause the skis and Jennifer to move more efficiently (the effect)?

Choose all that apply.

- a. Ski will glide for a longer distance
- b. It will be easier for Jennifer to balance over her gliding ski.
- c. It will put her skis on a very high edge angle.
- d. She will have to get shorter poles to move her arms faster.

5. Explain how your above cause and effect relationship (or prescription for change) will help Jennifer reach her goals. Choose all that apply.

- a. She will look better on her skis and can find a date.
- b. She will be more efficient, so she can ski for longer and faster.
- c. If she is carrying a pack, she will be better balanced, and less likely to fall.
- d. She will be able to ski black runs at her favorite XC area.

Teaching/Learning Cycle- Create Experiences for Learning-Quiz #13

1. How will you present and share information in a way that addresses how Jennifer learns.

- a. Show her what you would like her to do.
- b. Explain what you would like her to do.
- c. Have her experience it, by doing and feeling it.
- d. All the above

2. Jennifer is part of a class of 8 students. How will you organize your class so that they can see and hear you?

Choose all that apply.

- a. Put four students on either side of the track and ski your demonstration between them.
- b. Always have them do each activity one at a time.
- c. Be close enough so students can hear you and you can see all their faces.
- d. Have students follow you with the fastest ones always directly behind you.

3. While teaching how to balance on one ski, you see that some of your students are slipping backwards and tripping over each other's skis. This is happening because you forgot to...

- a. Make sure that your students are properly spaced
- b. Check their poles before the lesson.
- c. Take into account small terrain variations in an overall "flat teaching area."
- d. a and c.

4. You can promote group interaction and support by: Choose all that apply

- a. Making a fun game to help students learn each other's names.
- b. Design a team based exercise to get students cheering for each other.
- c. Directing most of your instruction to the slow students.
- d. Talking mostly to the students who you think will give you a good tip.

Teaching/Learning Cycle- Guide Practice- Quiz #14

1. How will you **deliver objective feedback** to Jennifer? Choose all that apply.

- a. Jennifer, what you are doing wrong is.....
- b. Jennifer, you need to stop having your CoM behind your base of support.
- c. Jennifer, it looks like you really like to glide on your skis. Let's try to make that glide even better.
- d. Jennifer, do you think that when you glide that you are balanced over one foot or more on both feet? (Getting her to reflect on her movements.)
- e. Jennifer, when you ski, I can see that your front ankle is flexed at 90 degrees and both your skis are always on the snow. Jennifer can you feel that.

2. How will you set-up practice for Jennifer? (Choose all that apply.)
- a. Jennifer would like to practice skiing downhill: practice on a slight, short downhill first.
 - b. Ski in straight lanes in the teaching area until you run out of lesson time.
 - c. Show her each step in your progression, then explain it, and then you have her practice it.
 - d. Have Jennifer imitate your movements as she skis behind you.
 - e. For a few minutes, have Jennifer ski without poles in the teaching lanes.

3. Guiding Practice Matching- *Choose the item in column B that supports the item in column A.*

Column A	Column B
<p>A. Make a game to help her explore a range of movement options where her CoM is in front of, over and behind her base of support.</p> <p>B. Spend half of the lesson in the teaching area and the other half on an easy trail because one of her goals is to learn about the trail system.</p> <p>C. Ask Jennifer if she feels like her practice matches what you asked her to do, and would she like to keep practicing or rest?</p> <p>D. You are now flexing your front ankle to almost 45 degrees at least 75% of time, at the beginning of push-off. Nice!!!</p> <p>E. Jennifer can you feel how you shortened your stride when the hill got steeper? Well done!!!!</p>	

4. Use the chart below to plan a short progression that meets Jennifer’s goals. Choose to Focus on either Body Position or Body Movement during Push off or Weight Transfer.

Focus/ Skill	Drill / Explanation / Maneuver	Terrain Description	Time (i.e. 12 min)

5. What can you, as an instructor, do to determine that Jennifer understands how to get her center of Mass over her Base of Support? Choose all that apply.

- a. Ask Jennifer “When do you feel most balanced?”
- b. Jennifer says, “I feel like I can glide forever.”
- c. Jennifer says she is having fun.
- d. You can see Jennifer’s front ankle is more flexed during her glide and her glide is longer.

Teaching/Learning Cycle- Review and Preview Quiz #15

1. How will you review the lesson with Jennifer? Check all that apply.

- a. Specifically tell Jennifer all the movements she did wrong during the lesson.
- b. Ask Jennifer “Can you tell me what we covered during our lesson?”
- c. Ask Jennifer “Do you have any questions about our lesson?”
- d. Ask Jennifer “What was your biggest take away of the lesson and why?”
- e. Tell Jennifer what you covered today and exactly what she learned.
- f. Ask Jennifer “were her goals were met today”. If yes, ask her how? If not, why not?
- g. Say, “Jennifer, now let’s establish a plan so you can practice on your own when you are not taking a lesson.”

2. How will you encourage Jennifer to come back to ski with you again? Circle all that apply.
- a. Mention to Jennifer “I really enjoyed skiing with you. Here is my business card, I would be delighted to ski with you again.”
 - b. Casually say “Were you thinking about taking another lesson?”
 - c. You say, “Jennifer, you said that a big part of your future backcountry hut trip is climbing hills. If you come back, we can work on uphill techniques.”
 - d. Mention to Jennifer to please come back, because you're broke and need to teach to make some money.



For OPTIONAL additional movement analysis practice, view another video from the PSIA-RM Movement Analysis videos. After you click on the link, select Level 1 skate skier named Chuck. A Movement Analysis grid is included below for your convenience.

<https://www.psia-rm.org/education/cross-country/#1540172379518-dee53537-2d90>

	Phases/Skills/Fundamentals		
Elements ↓	Push-off	Weight Transfer	Glide
Skis and poles			
Body position			
Body Movements			