



Professional Ski Instructors of America

ROCKY MOUNTAIN

American Association of Snowboard Instructors

Cross Country Level 1 Certification Workbook

Edited 2019



Name:

E-Mail address

Cell phone (optional):

Ski School /Club:



Welcome to the wonderful world of Cross Country ski instruction! This Certification workbook is designed to help you develop technical knowledge, teaching performance, and skiing ability on your path to become a Level 1 Certified Cross-Country Instructor. This workbook is divided into Two parts:

Part 1 - This section is designed to help you to develop your understanding and demonstrate your skiing, technical, and teaching knowledge. Please answer these questions as best you can **before** the Level 1 prep clinic (before the Level 1 Certification Event). During the prep clinic we will be going over any questions you may have as well as reviewing the answers to the workbook. You will be asked to turn in your completed workbook on the morning of your exam.

Part 2-Movement Analysis (MA) Model-This section will cover the Rocky Mountain MA model/format to be used as a tool while doing MA during Prep clinics and exams. This section will first explain the MA model, and then it will give you practice doing MA during a teaching/learning cycle scenario.

Booklets: At the pre-clinic and/or exam you will be issued a user-friendly on hill version of the scorecard (<https://www.psia-rm.org/education/cross-country/>) called a booklet. These booklets are copies of the exam scorecards used by the examiners at the certification.

In these Booklets you will write developmental suggestions for each item on the scorecards based on verbal comments from the Cross-Country Education Staff Members during the prep clinic and/or during the Certification Event. XC Education Staff Members may review your written comments as well.

You should be able to perform *the basics* of each of the skiing maneuvers listed in the Level 1 scorecard before coming to the Level 1 Prep clinic or certification. The Level 1 Prep clinic is designed to help you refine the skills and maneuvers you already possess in order to meet the Level 1 Cross Country Ski Instructor standard. *(You need to be an intermediate classic and skate skier, as this certification is not for beginner level skiers.)*

Note: Please remember the Learner's Responsibility Code; *I am responsible for my own learning!* That means that you are expected to take responsibility for your own learning. Make sure you learn what you need to learn, ask questions to get the answers you need, and use this Workbook to track your learning and what you need to work on.

Useful references include: the *PSIA Cross Country Technical Manual*, *PSIA-RM Cross Country Guidebook*, *Teaching Snowsports Manual*, PSIA-RM web pages: (www.psia-rm.org) and your fellow instructors. Be an active learner!

Only Cross-Country Education Staff Members working your event may initial a pass in your workbook unless otherwise noted.

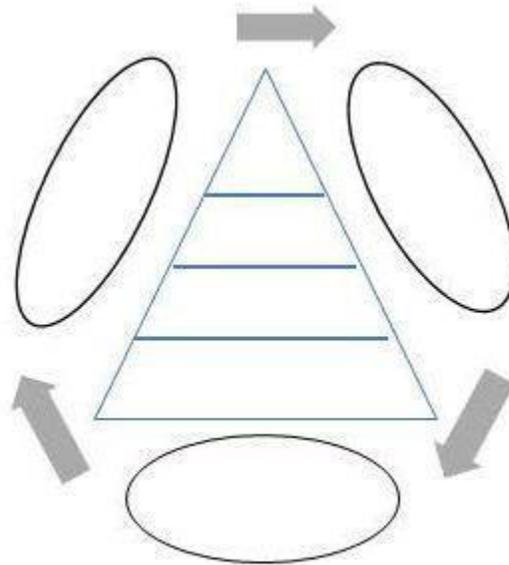
Part 1:

Technical Knowledge:

Part 1 The Cross Country Technical Model

1. Label the Parts in the diagram.

- a. What is the triangle called?
- b. The outer 3 circles represent
 - i. skills
 - ii. phases
 - iii. cross country skiing cycle
 - iv. all of the above
- c. What do the arrows represent?



2. Describe each of the 3 phases/skills.

3. What are the four layers of the Pyramid?

4. Describe Continuous Forward Motion.

5. What are the key elements of the Fundamental Body Position for cross country skiing?

6. What is the difference between the “real” and “ideal” description of a skier?

7. Why is balancing on one foot so important in cross country skiing?

8. Identify equipment needs for skiers at the beginner level.

9. Explain how waxless skis work.

10. Explain the basics of waxing classic skis.

11. Explain the characteristics of skating skis.

Skiing

1. Analyze the strengths and weaknesses of your own cross-country skiing in terms of your Fundamental Athletic Body Position.

2. What will you practice to improve your Fundamental Athletic Body Position in all three XC Skiing Phases?

3. How do you choose whether to use double pole or diagonal stride?

Teaching

1. What is the Snowsport's Safety code? (See PSIA-RM Cross Country Handbook or any mountain resort lift ticket).

2. Why do we use the Teaching/Learning Cycle, and what are the parts?

3. Name and explain the 5 different Teaching Styles.

4. List 3 drills you can use to teach your students to balance on one foot at a time.

Part 2:

Movement Analysis (MA) Model

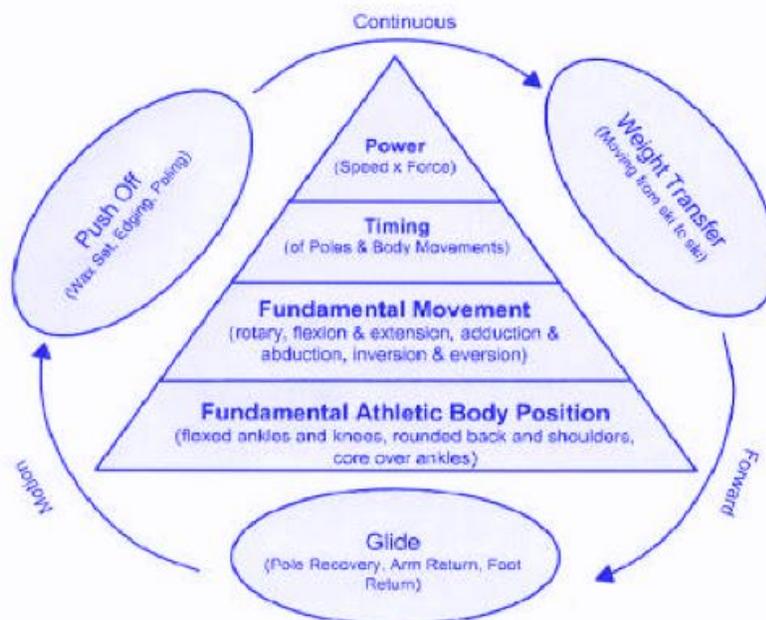
The next section will cover Movement Analysis, both the fundamentals of MA as well as the PSIA-RM MA format that candidates will be asked to use during certifications.

To be able to perform MA you must understand and be able to apply the following:

- The PSIA XC Technical Model
- The PSIA XC skills: Push-off, Weight Transfer, and Glide
- The National Cross Country Certification Skiing Standards Classic and Skate

Below are the Basics of the XC Technical Model and XC skills as well as the XC National Skiing Certification Standards for your reference. (For more details on the Technical Model and Skills, please refer to the XC Technical Manual.)

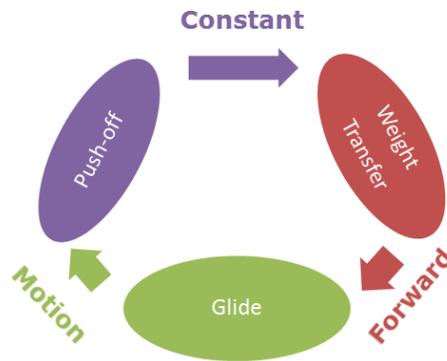
The PSIA XC Technical Model



The graphic above represents the PSIA XC Technical Model. At the center of the model is the Sports Performance Pyramid, a performance model for all sports that highlights the essential elements of body

position, movements, timing, and power. A coach, instructor or athlete can learn or teach any sport by breaking down the sport into movements, the coordination of those movements, and applying speed and force to those movements. The three cross country skills of push-off, weight transfer, and glide surround the pyramid, each of which have subskills (noted in parenthesis within the diagram) The circular connection and blending of the three skills embodies the desired outcome of efficient skiing: continuous forward motion

XC Skills

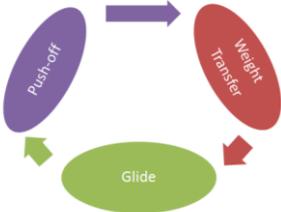


The Cross Country Skills surround the Sports Performance Pyramid to show the interaction of the Pyramid with the Skills of Cross Country Skiing . The Sports Performance Pyramid may be applied to any of the three Cross Country Skills in order to understand, teach and analyze that skill. The three skills (represented in the three ovals) are:

- **Push-off**, referring to using the skis and poles to propel the skis and skier forward.
- **Weight transfer**, referring to transferring weight completely from one ski to the other as the skier moves forward in classic and skate skiing. It can also refer to fore-aft weight transfer during double pole.
- **Glide**, referring to controlling pressure between the ski base and the snow to maximize glide while recovering from and preparing for push-off.



National Cross Country Certification Skiing Standards Classic and Skate

	Level I – Beginner/Novice Zone <i>The candidate is able to...</i>	Level II – Intermediate Zone <i>The candidate is able to...</i>	Level III – Advanced Zone <i>The candidate is able to...</i>
Fundamental Athletic Body Position for Push-Off , Weight Transfer and Glide 	Ski with a rounded back and athletic stance.	Ski with a rounded back, hips over the base of support, shin and torso angle matching.	Ski with a rounded back, hips in front of, over and behind the base of support depending on the phase, with shin and torso angle matching.*

*Highlighted to correspond to the example in the text below.

Classic Skiing Standards



	Level I – Beginner/Novice Zone <i>The candidate is able to..</i>	Level II – Intermediate Zone <i>The candidate is able to...</i>	Level III – Advanced Zone <i>The candidate is able to...</i>
<p>Push off</p>			
Power	Pole with the arm showing follow through. Demonstrate some flexion and extension in the lower body to set the wax pocket.	Pole with arms and abs showing follow through and pole release. Ski with flexion and extension in the lower and upper body to maintain propulsion.	Pole with arms and abs and lower body showing follow through and pole release. Ski with flexion and extension in upper and lower body to enhance propulsion.
Timing	Engage poles then core muscles.	Engage core muscles and poles simultaneously.	Engage core muscles before poles engage.
Fundamental Movements	Compress the ski with body weight to create grip. Ski with core compression/extension with some control of tipping, hinging, and twisting.	Compress the ski with flexion and extension to create grip. Ski with core compression/extension with more control of tipping, hinging & twisting.	Compress the ski with two cycles of flexion and extension to create grip. Ski with core compression/extension with minimal tipping, hinging & twisting.
	Level I – Beginner/Novice Zone <i>The candidate is able to..</i>	Level II – Intermediate Zone <i>The candidate is able to...</i>	Level III – Advanced Zone <i>The candidate is able to...</i>

Weight Transfer

Timing	Show some coordination of flexing and extending movements in the arms and lower body.	Show coordinated flexing and extending movements in the legs, core and arms.	Show coordinated flexing and extending in all joints during all techniques when skiing all terrain with minimal inefficiency.
Fundamental Movements	Transfer weight from ski to ski using leg extension, okay to land behind the heel of the gliding foot.	Transfer weight as the feet pass using leg and core extension, okay to land beside the gliding foot.	Transfer weight after the feet pass, using leg extension, core and rear arm extension.

Glide

Power	Pendulum (swing) the leg forward at least as far as the heel of the gliding foot.	Pendulum (swing) the leg forward (leg drive) for power as seen by glide on flats and slight uphill.	Pendulum (swing) the leg forward for power as seen by uphill glide.
Timing	Coordinated leg and arm recovery movements.	Coordinated leg, arm and hip recovery movements.	Coordinated leg, arm, and hip recovery movements demonstrating continuous motion.
Fundamental Movements	Balance and glide on one ski using ankle flex on green terrain as indicated by the ski tail off the snow.	Balance and glide on one ski using ankle flex, eversion, inversion, leg flexion and extension some of the time on different terrain and at different speeds as indicated by the ski tail off the snow.	Balance and glide on one ski using ankle flex, eversion and inversion, leg and upper body flexion and extension all the time on any terrain as indicated by the ski tail off the snow.*



Skate Skiing Standards

	Level I – Beginner/Novice Zone <i>The candidate is able to...</i>	Level II – Intermediate Zone <i>The candidate is able to...</i>	Level III – Advanced Zone <i>The candidate is able to...</i>
 <p>Push off</p>			
Power	Generate power through leg flexion and extension. Pole with the arms.	Generate power through active leg flexion and extension. Pole with the arms and abs showing follow-through and pole release.	Generate power explosive leg flexion and extension. Pole with core compression, arms and lower body showing follow through and pole release.
Timing	Engage poles then core muscles. Demonstrate double poles, V1, diagonal skate.	Engage core muscles and pole simultaneously. Demonstrate timing of and transitions between all techniques.	Engage core muscles before poles engage. Demonstrate timing for all techniques at all speeds and transitions with complete

			efficiency.
Fundamental Movements	Adequately edge the ski with extension and abduction. Ski with core compression/extension with some control of tipping, hinging, and twisting.	Progressively and adequately edge the ski with extension and abduction. Ski with core compression/extension with more control of tipping, hinging & twisting.	Progressively and adequately edge a constantly gliding ski with extension and abduction. Ski with core compression/extension with minimal tipping, hinging &
	Level I – Beginner/Novice Zone <i>The candidate is able to..</i>	Level II – Intermediate Zone <i>The candidate is able to...</i>	Level III – Advanced Zone <i>The candidate is able to...</i>
			
Power	Ski at a slow speed and one intensity.	Ski at varying speeds and intensities in all techniques through intermediate terrain.	Ski at varying speeds and intensities in all techniques in all terrain.
Timing	Show coordination of flexing and extending movements in the arms and lower body.	Show coordinated flexing and extending movements in the legs, core and arms.	Show coordinated flexing and extending in all joints during all techniques when skiing all terrain with minimal inefficiency.
Fundamental Movements	Weight transfer achieved through leg extension.	Transfer weight through arm and leg extension.	Transfer weight through arm, leg and upper body extension

			
Power	Use the projection of the core to accelerate the new glide ski.	Coordinate core projection with arm return to accelerate the new glide ski.	Coordinate the projection of core and hips with arm return to accelerate the new glide ski.
Timing	Coordinated leg and arm recovery movements.	Coordinated leg, arm and hip recovery movements.	Coordinated leg, arm, and hip recovery movements demonstrating continuous motion.
Fundamental Movements	Balance and glide on one ski using eversion and inversion on green terrain.	Balance and glide on one ski using eversion, inversion, leg flexion and extension some of the time on different terrain and different speeds.	Balance and glide on one ski using eversion and inversion, leg and upper body flexion and extension all the time, *demonstrating mastery of balance on all terrain, speeds

* Highlighted to correspond to the example in yellow on page 39.

How the Movement Analysis Works:

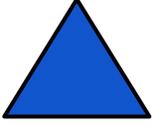
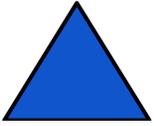
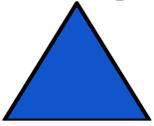
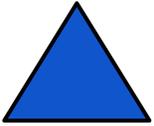
A successful instructor must be skilled in Movement Analysis because students want feedback, and analyzing movement provides the basis for the instructor's ongoing lesson plan. A general, but very effective strategy for movement analysis involves 3 basic steps:

1. Observe and describe "**the real**" (what you actually see in student's skiing)
2. Determine cause and effect relationships
3. Prescribe change toward "**the ideal**" (more effective way of skiing for the student)

Let's take an example and go through the MA process. Below is a picture of a Norwegian racer from back in the day. We will use the Movement Analysis Grid below to describe his skiing. Since it is just one photograph we can determine that he is in the Glide Phase of the Skiing Cycle.



Movement Analysis Grid

Elements ↓			
Skis and poles 			The tail of the left ski is off snow, the right ski is flat. lots of separation between skis fore and aft. More pressure on the tail of the right ski than the tip. Poles tips are not in the snow; left pole shaft is moved across the front of the body; right pole shaft is behind and parallel to body.
Fundamental Body position 			Hips are behind the gliding heel front ski, ankle extended and knee is extended, hip joint is flexed and, spine is straight
Fundamental Movements 			left arm swing (adduction) across body. More flexion in hips than ankle and knee. Upper body rotated more than lower body.
Timing 			Skier is at the end of the glide phase, just before wax is set and pole planted, when the back ski will drive forward
Power 			Relaxation now after push off from left ski and left arm driving forward and across, setting up for push off of right ski and driving through of left leg and right arm.

*open/extended and closed/flexed can be used interchangeably

By completing the above Movement Analysis Grid, we have isolated and **described** the movements of the skier and the movements of the equipment: the skis and poles. Now we are ready to

Determine Cause and Effect relationships. Body movements cause the skis and poles to respond in certain ways. The body movements that we observe are the cause and they produce effects in how the skis/poles move. In our example we saw that the skier has the tail of one ski off the ground and that there is quite a bit of ski separation. This indicates that skier has transferred weight to the gliding ski. Looking at the Body Position, we see that the hips are behind the base of support, the skier is closed at the hip joint with a left arm swing across the body, and the spine is straight. Putting these observations together indicates that the skier has achieved weight transfer mostly by a dramatic arm swing and by transferring weight to the heel of the front foot. Comparing with the Ideal of Modern Skiing, the PSIA National Standard for classic skiing at Level III, the descriptor for Body position in Glide Phase is (refer to page 11),

Ski with a rounded back, hips in front of, over, and behind the base of support depending on the phase, with shin and torso angle matching.

The descriptor for Fundamental Movements in the Glide phase of classic skiing says,

Balance and glide on one ski using eversion and inversion, leg and upper body flexion and extension all the time

Thus, the Real/ Ideal comparison suggests the **Prescription for Change would be (ideal):**

- Open(extend) the hip joint, and close (flex) the right ankle more. This will move the center of mass over the base of support, which is the right foot on the right ski. Moving the center of mass over the base of support will cause the ski tail to be lifted slightly higher.
- Swing left arm forward rather than across helping the center of mass to move in front of the base of support The pole shaft would now be parallel to the torso.

Now the instructor can prioritize movements to be changed and develop exercises which can help meet that goal.

In this example we used the PSIA National Certification Standards of Cross Country skiing as guidelines for identifying effective skiing. 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 example is offered to show step by step how to do Movement Analysis for instructors. More proficient instructors will be able to address any level of the pyramid with any phase to compose a complete movement analysis picture.

Now it's your turn to practice the MA model within the application of

Teaching/Learning Cycle below. Please Note: *At the Level 1 exam, the candidate will be asked to describe ski/pole performance, body position, and fundamental movements for **one phase/skill** (push-off weight transfer and glide) of the Movement Analysis Grid. Once this description is completed on the MA Grid, the candidate will be asked to determine cause and effect relationships and then the prescription for change.*

Write a lesson plan for a 2 hour beginner XC lesson with Brett. The steps of the Teaching/Learning Cycle are listed below. Please develop your lesson through these steps based on your knowledge of Brett and how he skis.

Your student, Brett is 26 years old, average fitness, and he wants to be able to ski as efficiently as possible. Brett has classic skied 5 times, and this is his first lesson on classic gear. Later this winter he is planning a hut trip. Brett owns and knows how to put on his equipment.

You can watch a video of Brett skiing at: psia-rm.org> Education> Cross country> Cross Country Movement Analysis Videos

1. Welcome and Introduce the lesson.

A. How do you welcome a student?

B. How do you develop trust?

C. List what questions will you ask your students to get more information.

D. List the important background information that you learned, and what goals Brett has for taking this lesson.

2. **Assess student and their movements.** Use the Movement Analysis grid below to assess Brett’s “real” skiing ability. After reviewing Brett’s video, describe what you see Brett’s skis doing, as well his fundamental body position during all the phases (push-off, weight transfer and glide). Fill in appropriate boxes below.

Video 1: Movement Analysis Grid-Brett

Elements↓	Push off	Weight Transfer	Glide
Brett’s Skis and poles-classic 			
Fundamental Body position Classic 			
Fundamental Movements 			

*The above Movement Analysis Grid is a tool to help the instructor describe what they see in their students' skiing. During each of the three phases, body position and fundamental movements causes the skis to perform in certain ways (the effect). In Movement Analysis, this is known as a **cause and effect relationship**. Understanding the cause - effect relationships that you see in your student's skiing will lead you to determining goals and planning the lesson experience.*

3. Determine goals and plan experiences.

A. Determine goals: You have identified Brett's "real" body position in all 3 phases in the grid above; now state below Brett's real body position for only one skill/ phase (push-off, weight transfer, or glide).

B. Next, describe the "ideal" body position that you would like to see in Brett's skiing in that same skill/phase.

C. How will changing Brett's body position cause the skis/poles to move differently/more efficiently (the effect)?

D. Explain how your above cause and effect relationship will help Brett reach his goals.

E. Plan the lesson content by filling in the box below. Under Focus, choose your lesson objective i.e. Body Position, Movement, and phase/ skill.

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

4. Create experiences for learning .

How will you present and share information in a way that addresses Brett’s visual, auditory and kinesthetic needs?

5. Guide practice

A. What factors will determine where and how you practice?

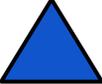
B. Check for understanding How will you know that **Brett** understands? What questions might you ask?

6. Debrief the learning Experience. How will you review the lesson, as well as get Brett back to ski with you again?

For additional movement analysis practice, view another video of a skate skier named Chuck, found by going to: psia-rm.org > Education > Cross Country > Cross Country Movement Analysis Videos and view the video: Level 1 skate skiing student-Chuck.

Then please fill out each box in the Grid below.

Video 2: Movement Analysis Technical Model Grid-Chuck

Elements ↓			
Chuck's Skis and poles Skate 			
Fundamental Body position Skate 			
Fundamental Movements 			

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 comments or questions regarding PSIA RM cross country education program contact: Patti Banks, Cross Country Chairperson; patebanks@yahoo.com
- For specific comments or questions regarding this workbook contact Cross Country Education Staff: Dale Drennan; d2skier@sbcglobal.net