



Professional Ski Instructors of America

ROCKY MOUNTAIN

American Association of Snowboard Instructors

Cross Country

Level 2

Certification Workbook Edited July 2019



Name:

E-Mail address:

Cell phone :

Ski School /Club:

Welcome! This Certification workbook is designed to help you develop technical knowledge, teaching performance, and skiing ability on your path to become a Level 2 Certified Cross-Country Instructor. This workbook is divided into two parts:

Part 1 - Candidate Section: This section is designed to help you to develop your understanding and demonstrate your technical, and teaching knowledge.

Please answer all of your questions in the workbook to the best of your knowledge before attending a Level 2 prep clinic. 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 the completed workbook on the first day of the Level 2 exam.

Part 2-Movement Analysis (MA) Model-This section will cover the Rocky Mountain MA model/format to be used as a tool while performing 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: During the prep-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 each of the skiing maneuvers listed on the Skiing section of the level 2 scorecard before coming to the Prep clinic or certification. The Level 2 prep clinic is designed to help you refine the skills and maneuvers that you already possess to meet the Level 2 Cross Country Ski Instructor standards. Be aware that to obtain Level 2 certification, you must be at least a strong intermediate classic and skate skier, and you must be able to teach a solid intermediate classic and skate lesson. as well as being verified by the Cross-Country Education Staff at the Level 2 standard in Skiing, Technical Knowledge and Teaching.

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*, *Snowsports Teaching manual*, *PSIA-RM XC Guidebook*, and PSIA-RM web pages (www.psia-rm.org), *The Complete Encyclopedia of Skiing (Bob Barnes)* and your fellow instructors. *The Master Skier* magazine and www.fasterskier.com provide articles and discussions on the latest racing techniques and are of special interest to advanced skiers. Be an active learner!

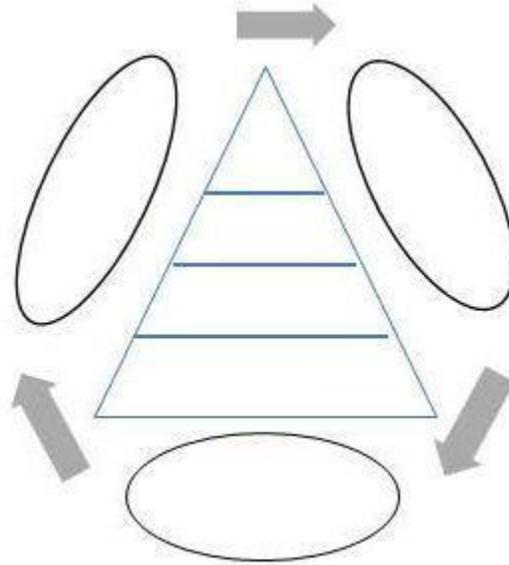
Part 1: Candidate Section

Technical Knowledge:

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. Name and explain each of the fundamental movements from the technical model.

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

7. What is the difference between the “real” and “ideal” description of a skier?
8. What are the 4 XC skiing fundamentals?

Skiing

1. What are some Fundamental Movements (from the Sports Performance Pyramid) that you are working on in your own skiing?
2. How do you know if you are achieving one-ski balance with each stride/skate?
3. Why is having a good fundamental body position so important in cross country skiing?
4. Why aren't power and timing at the bottom of the pyramid?
5. Why is gliding on one ski important in cross country skiing?

6. In your opinion what distinguishes the classic skiing of a Level 2 XC instructor from that of a Level 1 XC instructor? Are you skiing at the Level 1 or Level 2 standard? (Please refer to the XC Standards for this question). Explain your answer.

7. What fundamental movements do you use to turn your skis?

8. Describe the fundamental movements of the hip, knee and ankle joints during push-off.

9. What is the difference between a skill/ phase and a movement?

10. Why is practicing kick-double pole without poles useful for improving diagonal stride?

11. What is the timing difference between V1 and V2 skating?

Equipment and the Student

1. What is the difference between grip wax and glide wax?

2. How do you apply klister to a ski? How do you get it off?

3. What does Thicker, Longer, Change (TLC) mean with reference to waxing? Do you agree with this adage?

4. Do you recommend wax-able or pattern-based skis for your intermediate classic students? In terms that your client can understand, explain your answer, keeping their goals in mind.

5. Match the condition with the preferred choice for classic skiing. (Note: Some conditions could have more than one possible letter match.)

- | | |
|--|--------------------------------|
| ___ fresh cold snow; Temperature is 15° F | a. red Klister |
| ___ varying spring snow conditions | b. hard wax |
| ___ granular in the shade; wet in the sun | c. binder with hard wax on top |
| ___ 30K race, fresh snow; Temperature is 25° F | d. hard wax over soft wax |
| ___ icy tracks; Temperature is 32° F | e. wax-less skis |
| | f. fluorocarbon wax |

6. Complete the chart below:

Physical problem	Symptoms	Prevention	Treatment
Altitude sickness			
		Drink water before during and after skiing	
Hypothermia			
	White spots on the face and nose. (It's not sunscreen!)		

7. How do you find the grip wax pocket on a pair of wax-able classic skis?

8. What is structure on a ski base? Describe how, when, and why you would use it.

Teaching

General Teaching Knowledge

1. In the chart below list the seven points of the Snowsport’s Safety code. Give an example of how you would apply each in your lessons. (See PSIA-RM Nordic Handbook or any mountain resort lift ticket.) The first point of the code has been done for you.

Responsibility Code	Application
1. Stay in control and be able to stop or avoid people or objects.	Teach students half- wedge, wedge and step turns. Practice avoiding cones in an obstacle course
2.	
3.	
4.	
5.	
6.	
7.	

2. Summarize the primary teaching styles in your own words.

a.

b.

c.

e.

3. For each lesson situation in the chart that follows, choose one or two of the primary teaching styles that you would use during most of your lesson time. Then in the space provided explain briefly why this teaching style would work best for you under that circumstance.

Your lesson situation is:	Teaching style(s) you would use during most of your lesson time	Why you would use this style
1 1/2 hour lesson. Your students are advanced adults some of whom are citizen racers		
2-hour morning kids group with skills ranging from advanced beginner to advanced		
Afternoon two-hour session of the above group		
1 1/2 hour clinic: Adult intermediate classic skiers who want to experience something new and better in their skiing		
1 hour private lesson with a timid lady who wants to work on her downhill technique		

4. Give 2 exercises/ drills that will:
Improve weight transfer in the various skating techniques

- 1.
- 2.

Improve push-off in diagonal stride on a steep hill.

- 1.
- 2.

1.

2.

5. Give 2 exercises/drills that improve a skier's hips coming forward in the glide/weight transfer phase of Double Pole?

6. An intermediate student asks you to teach him how to better negotiate corners on Nordic trails. He already uses wedge turns on flat terrain. Describe your approach and a progression for teaching Wedge Christie and Step Turns on Cross Country skis.

Part 2

Movement Analysis (MA) Model

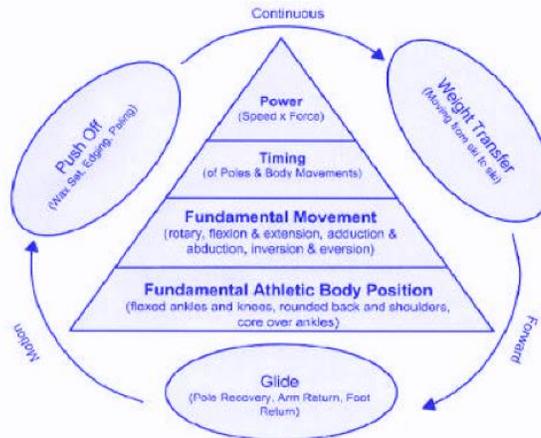
The next section will cover Movement Analysis, both the fundamentals of MA as well as the PSIA-RM MA format that candidates will be asked to use during certifications.

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

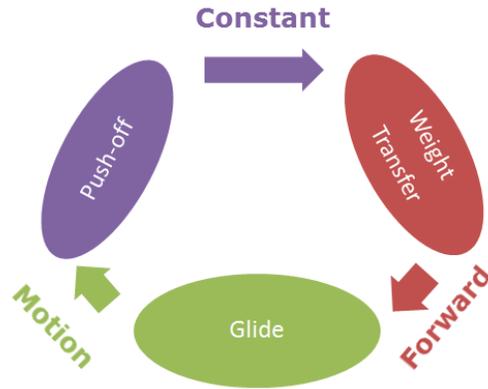
Below are the Basics of the XC Technical Model and XC skills as well as the XC National Skiing Certification Standards for your reference. (For more details on the Technical Model and Skills, please refer to the XC Technical Manual.)

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

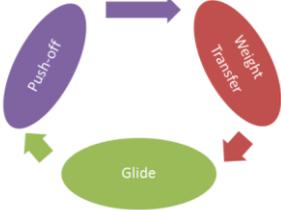


The Cross Country Skills surround the Sports Performance Pyramid to show the interaction of the Pyramid with the Skills of Cross Country Skiing . The Sports Performance Pyramid may be applied to any of the three Cross Country Skills in order to understand, teach and analyze that skill. The three skills (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>
			
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	Level II – Intermediate Zone	Level III – Advanced Zone

	<i>The candidate is able to..</i>	The candidate is able to...	<i>The candidate is able to...</i>
			
Power	Ski at a slow speed and one intensity.	Ski with varying speeds and intensities in some techniques.	Demonstrate mastery of applying power at varying speed and intensities on all terrain and techniques.
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.
			
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	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.*

		ski tail off the snow.	
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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:

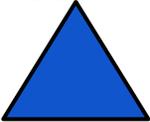
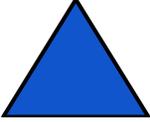
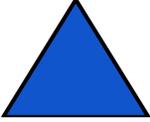
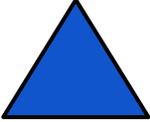
1. Observe and describe **“the real”** (what you actually see in student’s skiing)
2. Determine cause and effect relationships
3. Prescribe change toward **“the ideal”** (more effective way of skiing for the student)

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 ↓	Push off	Weight Transfer	Glide
Skis and poles			The tail of the left ski is off snow, the right ski is flat. lots of separation

			<p>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 the body.</p>
<p>Fundamental Body position</p> 			<p>Hips are behind the gliding heel front ski, ankle extended and knee is extended, hip joint is flexed and, spine is straight</p>
<p>Fundamental Movements</p> 			<p>left arm swing (adduction) across body. More flexion in hips than ankle and knee. Upper body rotated more than lower body.</p>
<p>Timing</p> 			<p>Skier is at the end of the glide phase, just before wax is set and pole planted, when the back ski will drive forward</p>
<p>Power</p> 			<p>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.</p>

*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 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 15),

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 2 exam for two phases/skills of the Movement Analysis Grid, the candidate will be asked to describe ski/pole performance along with any 2 elements. 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 intermediate skate lesson with Anne. The steps of the Teaching/Learning Cycle are listed below. Please develop your lesson through these steps based on your knowledge of Anne and how she skis. Here is some information on your student: Anne is a 28-year-old woman who would like to ski longer without getting so tired. Anne is a musician and an advanced telemark skier.

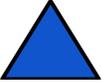
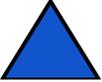
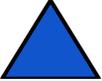
You can watch a video of Anne skiing at psia-rm.org> Education> Cross country> Cross Country Movement Analysis Videos > Level 2 skate student -Anne

1. Welcome and Introduce the lesson. How do you develop Anne's trust? What questions will you ask her to get more information? List the important background information that you learned as well as her goals for taking this lesson.

2. Assess the student and her movements

Use the Movement Analysis Grid below to assess Anne's "real" skiing ability. After reviewing Anne's video, describe what you see Anne's skis doing, her fundamental body position, and fundamental movements during all the phases (push off, weight transfer and glide). Fill in appropriate boxes below.

Movement Analysis Grid-Anne

Elements ↓			
Anne's Skis/poles 			
Fundamental Body position 			
Fundamental Movements 			
Timing 			
Power 			

The above Movement Analysis Grid is a tool to help the instructor describe what they see (Fundamental body position, fundamental movements, timing and power) in a student's skiing. Fundamental body position, fundamental movements, timing and power are called elements. During each of the three phases, these 4 elements of the Sports Performance Pyramid cause the skis to perform in certain ways (the effect).
 Level 2 Movement Analysis considers the relationship of 2 elements to ski performance during 2 phases/skills.

3. Determine goals and plan experiences:

A. Determine goals: You have identified Anne's "real" body position and movements in all 3 phases in the grid above. Now, state below Anne's real body position or movements in two skill/ phases of your choice, that you would like to change in Anne's skiing.

B. Next, describe the "ideal" body position or movements that you would like to see in Anne's skiing in that same 2 skill/phases.

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

D. Explain how your cause and effect relationship from above will help Anne reach his goal.

E. Plan experiences: 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 experience for learning.

How will you present information for Anne’s optimum learning (VAK)?

5. Guide practice.

What will determine your choice for terrain, practice intensity, and practice time for Anne?

Check for understanding. How will you know that Anne understands? What questions will you ask?

6. Debrief the Learning Experience

How will you review the lesson with Anne as well as get Anne back to ski with you again?

*For additional MA practice review and analyze Maria in the following classic skier video.
psia-rm.org> Education> Cross country> Cross Country Movement Analysis Videos > Level 2 classic student -Maria*

Now fill out each open box in the Movement Analysis Grid on Maria.

Elements ↓			
Maria's Skis/poles 			
Fundamental Body position 			

<p>Fundamental Movements</p> 			
<p>Timing</p> 			
<p>Power</p> 			

Date revised 8/19

Thank you for participating in the PSIA Level 2 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. Similarly, we are constantly striving to improve our educational programs and materials. Please feel free to contact the 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 XC Education Staff: Dale Drennan; d2skier@sbcglobal.net