NORTHERN MICHIGAN REGION NATIONAL SKI PATROL ACCREDITED SENIOR EVALUATOR (ASE) STUDY GUIDE SKI (ALPINE/TELEMARK) AND SNOWBOARD

Updated 10/1/2021

Version 2.0

- Accredited Senior Evaluator (ASE) for Skiing (Alpine and Telemark) and Snowboarding is a certification for evaluating new senior candidates at the senior exam. The certification is effective for three years then requires a recertification at a division clinic.
- The ASE program was developed in the Central Division to allow non-PSIA-AASI certified alpine seniors to study and test within the NSP to also become accredited as a senior alpine evaluator without the PSIA-AASI requirement. Testing is offered yearly as needed, to be hosted by one of the regions.
- This document was created in addition to the information available on the Central Michigan website to assist ASE Ski or Snowboard candidates prepare for the ASE examination.

SECTION 1 – PROGRAM OVERVIEW

ASE Program Overview

The ASE Program (Accredited Senior Evaluator) was created by the Division Skills Development Team to provide an alternate path for those potential Senior Alpine Evaluators not wishing to pursue PSIA/AASI certification. It was conceived as an inexpensive and less time consuming alternative to traditional PSIA/AASI training.

As an ongoing program, it has successfully integrated alpine exam teams with both ASE and PSIA/AASI credentialed evaluators.

Understanding that senior alpine evaluator skills are developed through local and region mentoring, the Central Division provides periodic ASE certification exams to validate a candidates understanding of the appropriate skills. This process is ultimately intended to assure a more consistent program division wide and ultimately a higher quality experience for our Senior Alpine Candidates.

Those interested in pursuing ASE certification must currently hold senior patroller status. Further, each candidate must also have his/her Region Directors endorsement prior to attending an exam. Currently, two day ASE exams are held at one of several Division Clinics offered in December. A nominal fee is charged and once completed; certification is valid for a three year period.

The ASE program is not intended for those with PSIA/AASI Level II or III credentials. PSIA/AASI and ASE certified senior alpine evaluators are both expected to keep their credentials current by completing a Central Division calibration clinic once every three years. Lastly, membership in the NSP-C ski school is highly recommended, promoting community among our trainer ranks.

Additional course information and suggested study materials are referenced in detail within the ASE program documents on our Central Division website.

NOTE: This document is designed as a study guide for the skills necessary to pass the ASE written and on hill exams.

SECTION 2 – ASE CANDIDATE NOMINATION AND PREPARATION PROCESS

Per the Central Division, the following process has been established to help ensure that ASE candidates are identified to meet region Senior Ski/Ride Evaluator needs and are prepared to pass the ASE Exam.

- Region directors will work with their staffs to identify any potential ASE candidates by November 1st.
- Region directors will work with their staffs to identify a region wide mentor or mentor for individual potential ASE candidates by November 1st. Mentors should be currently certified Senior Ski/Ride Evaluators with at least 3 years of experience, ideally PSIA/AASI Level 2 or Level 3. The mentors will work with the ASE candidates to prepare them for the ASE Exam. Note: An example syllabus has been made available by the division to aid in this preparation.
- Region directors will communicate their list of potential ASE candidates and mentor assignments to the division Senior Program Supervisor by November 1st. This will allow time for adequate preparation and initial planning of the ASE Exam.
- The division may offer an ASE Prep event at the Division ASDWs and/or mid-winter training events. Current year ASE candidates are encouraged to attend an ASE Prep event at a division ASDW (December). Mentors may also attend the ASE Prep event, if space is available.
- Before a potential ASE candidate is allowed to participate in the ASE Exam their mentor must attest to their readiness to participate in and pass the ASE Exam.

SECTION 3 – ADDITIONAL ASE PREPARATION AND EXPECTATIONS

- There is a significant level of "academics" that is required for exam preparation. You will need to study and prepare for the ASE program.
- On Hill - Demonstrating the senior level standard is required for your discipline (Alpine Ski, Snowboard, and Telemark). Identifying the senior level standard is required for all disciplines.
- This document along with other reference documents, books and videos are tools to prepare you for the written and on hill exam. Study partners or groups are encouraged.
- The Central Division website is the primary source for preparation material and can be helpful. See https://www.nspcentral.org/ase/ for additional links.
- If you meet the criteria as a candidate for the ASE Program as noted in Section 1, work with your Region Ski School Director early. The deadline for candidates from the Region Director is November 1st. Once accepted, it is highly recommended to attend the Division clinics such as the Advance Skills Development Workshop (ASDW) and work with other certified ASE Instructors who can assist or mentor you as a new candidate.

SECTION 4 – SKI-SNOWBOARD TECHNICAL VOCABULARY

(Ski/Snowboard in Black, Ski only Red, Snowboard only Blue)

The foundation of the ASE program is based on a thorough understanding and application of the terms and concepts in this section.

(Ski/Snowboard/Telemark in Black, Ski only Red, Snowboard only Blue)

- **Angulation:** Laterally tipping and flexing certain parts of the body, more than others, to form angles between body segments.
- **Apex:** A point in an arc where the skis/snowboard is pointing or matched with the fall line.
- **Athletic Stance:** A body position in which the skier/snowboarder is in balance without excessive leaning (laterally, fore or aft) and is aligned over their feet.
- **Balance:** A state of equilibrium that provides both a source for and an outcome of effective movement; when the skier/snowboarder's center of mass and base of support are aligned to counteract the forces generated by the snow.
- **Banking:** A form of inclination that describes a relatively straight body leaning toward the inside turn.
- **Base:** The bottom surface of skis or snowboards.
- **Base of Support (BOS):** BOS is where the person's weight is distributed on the snow. Move BOS. Shifting the position of the feet forward and backwards underneath the Center of Mass.
- **Blocking:** Using internal (muscles) or external (pole plants) forces to stop rotation of the upper body
- **Camber:** The arched shape of an unweighted ski or snowboard along its length, when viewed from the side; traditionally a slightly-bowed shape.
- **Carving:** Ski/snowboard passes on edge from tip to tail through the same curved arc with minimal slipping or skidding. Turn develops increases inclination and angulation. Arc is created by ski/snowboard design. Higher angles and greater degrees of inclination will be present with greater speeds and forces.
- **Center of Mass (CM):** Represents the point around which the body's mass is equally distributed or concentrated. CM is central balance point of body mass. Starts with athletic stance.
- **Counter Rotation:** Twisting the upper body in one direction and the lower body in another direction at the same time.
- **Dorsiflexion:** Ankle flexion of the foot upward toward the shin.
- **Dynamic balance:** The ability to effectively retain balance while in motion.
- **Dynamic parallel:** Turns are made with more carving than skidding.
- **Edging - Early Edge Engagement:** Skis/snowboard has come up onto a working edge before the apex of the turn.

- **Edge:** A metal strip inserted between the base and the core on the side of ski or snowboard; the edge can be sharpened, allowing the skier or snowboarder to slice through hard snow or ice.
- **Extension:** Any movement that increases (i.e. opens) the angle at the joint. At times, skiers or snowboarders extend the knee, hips and ankle joints simultaneously.
- **Fakie**: Riding backwards or with your non-dominant foot forward. Also referred to as "riding switch".
- **Fall line:** The path which a ball or water would take if you let it roll down the slope; line of least resistance.
- **Falling Leaf:** An exercise in which a skier or snowboarder carves or skids in a fore and aft movement on the same set of edges creating a "falling Leaf" pattern.
- **Flexion:** Any movement that decreases (i.e. closes) the angle at the joint. Often entails bending the spine, knee, hip and ankle joints simultaneously.
- **Fore Movement:** Moving towards the tip or skis or snowboard.
- **Heel Edge**: The edge of the snowboard where the heel hits.
- **Inclination:** The center of mass has moved inward towards the center of the turn resulting in the body having less distance to travel around the arc that the skis/snowboard, tipping.
- **Inside Half:** Hip and ski ahead and higher related to the outside ski.
- **Learning Styles:** Styles a learner uses to have meaningful changes for improvement. Learning styles may include auditory, visual, kinesthetic, and sensory, or any combination thereof.
- **Leash:** A retention device used to attach the snowboard to the front foot so it won't slide away while getting in or out of the bindings. A leash may be used on some telemark bindings as well.
- **Movement Analysis:** The process of observing a movement, evaluating the relevance and effect of that movement on other movements and the action of the skis/snowboard, and prescribing changes for enhanced efficiency, effectiveness and performance.
- **Open parallel:** Skis are parallel throughout the turn, but may be on a lower edge angle, allowing some drifting to occur.
- **Parallel:** The skis remain matched on corresponding edges through the entire arc of connected turns with simultaneous edge release and engagement.
- **Pivot:** Control the Ski's or snowboard's pivot through flexion/extension and rotation of the body. Skis/snowboard are flat and the skier's boarder's direction of travel does not change
- **Pole Plant:** In relation to a pole touch, a pole plant is harder, more deliberate snow contact used to stabilize the upper body, manage momentum and control rotation.
- **Pole Touch:** The light touch of the pole tip in the snow, which promotes the proper timing and rhythm of turns. Pole swing aids forward movement to maintain pressure toward the front of the skis at turn initiation.

- **Pressure Management**: Flexing and extending movements of legs and core, redistribution of weight from foot to foot, increase and decrease of edge angles, turn shape and size.
- **Q-Angle**: The angle between the extended axes of the femur and the tibia, measured at the mid-patella (kneecap). The angle is typically larger for women than men due to women often have a relatively wider pelvis.
- **Revert**: To switch from riding fakie to forward, or from forward to fake typically while the snowboard is still touching the ground.
- **Rocker:** The shape or design of a ski/snowboard with reverse camber throughout part or all its length. The three categories of rocker are: tip/rocker/early rise, tip and tail rocker and full rocker.
- **Rotary:** A twisting of the feet, legs, core and other body parts in an effective balanced manner.
- **Snowboard Stance:** "Regular" is left foot forward in the stance; "Goofy" is right foot forward in the stance.
- **Side cut:** The hourglass shape of the ski/snowboard
- **Slide slipping/Slipping:** Travel in a direction sideways to the length of the ski/snowboard.
- **Skidding:** The tails of the skis/snowboard travels a further distance through a turn than the tip with a combination of skidding and slipping (drifting). Blends forward and sideways action
- **Steering:** The skis are rotated and edged to follow a curved path
- **Switchstance (Switch)**: Riding with your non-dominant foot forward. Also referred to as riding fakie.
- **Tilt:** The act of adjusting the angle between both edges (base of broad) or one edge and the sliding surface.
- **Tactics:** A blending of skills (balance, rotary, edging, pressure and magnitude) to meet an outcome.
- **Tasks:** An activity that develops a skill (balance, rotary, edging and pressure) to meet an outcome
- **Toe Edge**: The edge of the snowboard closest to the toes. Opposite of heel edge.
- **Traverse:** To ski or snowboard across the slope in a horizontal or diagonal path
- **Wedge:** The tips of the skis are closer than the tails and are converging/pointing inward toward each other.

SECTION 5 – SENIOR/ASE SCORECARDS AND ON HILL EVALUATION/ DEMONSTRATION (SENIOR STANDARD)

Here's an overview of a typical ASE Exam Day

The exam is a Central Division event. The agenda below is an example of your Exam Day. Items highlighted in **blue** are the fundamental items to prepare for. These items are discussed throughout this guide.

Exam Day

- **8:00 Inside**
- Welcome, Introduction, and agenda
- Program Overview from NSP Central **(Section 1)**
- **Senior Score Card Review (Section 5)**
    - Be very familiar with the scorecard. Be able to describe and discuss in detail each line item that applies to skiing (alpine/telemark) and snowboarding.
- Ski/Ride standards, the 5 fundamentals **(Section 6)**
- **Video Exam – 7 videos** (5 skiers, 2 riders, 1 tele)
    - Video is shown to the group of candidates.
    - On a scoresheet, each candidate working on their own rating for each skier/snowboarder to the senior standard. Scoring choices are: meets the standard "=", exceeds the standard "+", or does not meet the standard "-". List comments to support your decision especially for those who do not meet the standard.
    - Scores are recorded.
    - A group discussion/review is then conducted on each video.
- **10:00 Outside**
- Warm up/Learn the terrain
- **Candidate skiing/demos at the senior standard**
    - Each candidate will demonstrate the senior standard for three runs – groomed slope, steep ungroomed and moguls.
    - Ensure you know how to demonstrate the standard.
    - For some, you may have to "dial down" your current level of skiing/snowboarding to the senior standard. Practice your demos, it can feel awkward skiing/snowboarding the standard when you normally ski/snowboard above the standard.
- **12:00 Lunch**
- Typical Senior Evaluation Process. Discussion
-

- **1:00 Outside**
- **Senior Evaluation (Candidate lead)**
    - Candidates now become the evaluators and the exam evaluators act like candidates.
    - The senior score card is used to rate each candidate.
    - The candidates will ski/snowboard three runs – groomed slope, steep slope, mogul/ungroomed slope.
    - Each evaluator will assume the role of lead evaluator for at least one run.
    - The evaluators observe the run.
    - Following the run, the lead evaluator will facilitate a group evaluator discussion and reach a consensus for the skier/snowboarder score (=, + or -).
    - Be brief and concise in when giving your score feedback.
- **3:00 Inside**
- Candidate summarizes scores and provides results and feedback to the skiers/snowboarders from the mock evaluation.
- **Written Test Review /Q and A**
    - The candidates will take an online test prior to exam day. There are multiple choice and fill in the blank questions.
- The test is reviewed.
- Candidate evaluation forms
- Evaluators score ASE candidates and provide feedback
    - Candidates are given their overall individual exam results
- **Exam completed at 6:00**

Senior Alpine Scorecard

Central Division

Senior Alpine Score Cards

Central Division Senior Performance Evaluation – Alpine Skiing, Telemark Skiing, Riding (rev. 2018)

Location: Date: / /

Instructors/Evaluators:

Terrain:	Slope selection should be more/to most difficult terrain based on evaluation day conditions and appropriate to skills be evaluated.
Turn Shape:	Round-shaped turns are desired in most applications of skiing and riding. They follow a symmetrically curved path from start to finish.
Turn Size:	Small radius turns will be smaller than a groomer width. Medium up to two groomer widths, and Large radius are greater than two groomer widths.
Risk Management:	Instructors and candidates will communicate any concerns regarding risk management. Strict efforts must be made to ensure the safety of all participants.

	Equipment			(+) Exceeds Objectives (=) Meets Objectives (-) Does Not Meet Objectives		
	alpine	telemark	riding	Candidate	Candidate	Candidate
Candidates will demonstrate the principles of good on snow performance applicable to equipment being used.						
Principles common to all terrain						
1. Control the fore/aft relationship of the Center of Mass to the Base of Support to manage pressure along the active edge of the length of the skis or board	x	x	x			
2. Regulate the amount of pressure created through the ski-board/snow interaction with flexion and extension movements	x	x	x			
3. Control Edge angles through a combination of Inclination and Angulation	x	x				
4. Control Rotary (turning/pivoting/steering) with Leg rotation separate from a stable upper body	x		x			
5. Control Pressure from ski to ski as they direct pressure to the outside ski	x					
6. Control the lateral relationship of the Center of Mass to the Base of Support to manage pressure from ski to ski		x				
7. Control the turning of the skis with rotation of the feet and legs in conjunction with discipline in the upper body		x				
8. Control the size, duration , intensity rate and timing of the lead change to manage fore/aft stability		x				
9. Control edge angles through flexion, extension and inclination			x			
10. Use torsional flex to begin rotation and to engage the new edge with progressive pressure throughout the turn			x			
Terrain specific principles for Groomed Slope Skiing / Riding						
11.Connected and rounded turn shapes of varying sizes for consistent speed and control	x	x	x			
12. Consistent speed and control	x	x	x			
13.Pole touch if used, will compliment the turn in timing and direction of travel	x	x				
14.Parallel turns with simultaneous foot tipping/steering (skidding & carving acceptable), both feet remain in contact with the snow	x					
15.Parallel turns with simultaneous lead change (skidding & carving acceptable), both feet remain in contact with the snow		x				
16.Utilize "tele turns" with lead change for a majority of the run, as appropriate		x				
17.Confident switch riding ability.			x			
Groomed Slope Performance: PASS OR FAIL (P) (F)						
Terrain specific principles for Steep Slope Skiing / Riding						
11.Rounded and connected short radius turns for a controlled fall line descent	x	x	x			
12.Pole touch if used, will compliment the turn in timing and direction of travel	x	x				
13.Parallel turns with simultaneous foot tipping/steering (skidding & carving acceptable), both feet remain in contact with the snow	x					
14.Parallel turns with simultaneous lead change (skidding & carving acceptable), both feet remain in contact with the snow		x				
15.Utilize "tele turns" with lead change for a majority of the run, as appropriate		x				
Steep Slope Performance: PASS OR FAIL (P) (F)						
Terrain specific principles for Mogul/Ungroomed Slope Skiing / Riding						
11. Connected turns for a controlled fall line descent	x	x	x			
12. Pole touch/plant that aides in stabilization and timing	x	x				
13. Parallel turns with simultaneous foot tipping/steering, both feet remain in contact with the snow	x					
Mogul/Ungroomed Slope Performance: PASS OR FAIL						
CANDIDATE MUST PASS ON ALL THREE TERRAINS (Groomed, Steep, Mogul/Ungroomed) TO BE SUCCESSFUL						
FINAL SCORE FOR ALPINE SKILLS EVALUATION: PASS or FAIL (P) (F)						

Accredited Senior Evaluator
(ASE) Candidate Evaluation - Central Division

Lead Evaluator: **Location of Evaluation:** **Candidate Name:** **Region:**	
Final Evaluation: CSE demonstration Meets or Exceeds level in all areas + = **Day 1:** + = - **Day 2:** + = -	
Senior Eval. Assessment	**Comments**
Obj. 1: utilize senior card in a demo about the senior evaluation + = -	
Obj. 2: identify correct senior movements using video/live demos + = -	
Obj. 3: demo feedback by modeling positive corrective suggestions using video/demos + = -	
Senior Eval. Performance	
Obj. 4: eval. of senior skills at the senior level + = -	
Obj. 5: demo of effective movements at the senior level (refer to senior scorecard) + = -	
Obj. 6: competent level on technical vocabulary	**Written Test Score:**

Evaluation Team:

Accredited Senior Evaluator
(ASE) Candidate Evaluation - Central Division

Evaluator:	**Location of Evaluation:**
Candidate Senior Evaluator:	
Region:	**Date:**
Day 1:	+ = -
Senior Evaluator Assessment	Competency as a senior level evaluator
Obj. 1: utilize senior card in a demo about the senior evaluation (Senior Card reprinted on back of this)	
Obj. 2: identify correct senior movements using video/live demos (10 video clips)	**Assessment of video:** + = - **1.** **2.** **3.** **4.** **5.** **6.** **7.** **8.** **9.** **10.**
Obj. 3: demo feedback by modeling positive corrective suggestions using video/demos	

Day 1 Evaluation Team:

Accredited Senior Evaluator
(ASE) Candidate Evaluation - Central Division

Evaluator:	**Location of Evaluation:**
Candidate Senior Evaluator:	
Region:	**Date:**
Day 2:	+ = -
Senior Eval. Performance	Competency in senior level performance
Obj. 4: Eval. Of senior skills at the senior level	
Obj. 5: demo of effective movements at the senior level (refer to senior scorecard printed on back)	
Obj. 6: competent level on technical vocabulary	**Written Test Score:**

Day 2 Evaluation Team:

SECTION 6 – SKI/SNOWBOARD FUNDAMENTALS[1]

Summary version of the score card principles by Discipline

- **Skiing Fundamentals**
  - Control the relationship of the Center of Mass (CM) to the Base of Support (BOS) to direct pressure along the length of the ski/snowboard
  - Control pressure from ski to ski and direct pressure toward the outside ski
  - Control edge angles through a combination of inclination and angulation
  - Control the skis rotation (turning, pivoting, steering) with leg rotation, separation from the upper body
  - Regulate the magnitude of pressure created through ski/snow interaction
  - Control the size, duration, intensity rate and timing of the lead change to manage fore/aft stability (telemark)
- **Fundamental Ski Results**
  - Consistent speed and control
  - Connected, round and symmetrical turn shapes of varying sizes
  - Parallel turns with simultaneous foot tipping/steering, both feet remain in contact with the snow
  - Pole touch, if used, compliments turn timing and direction of travel
- **Snowboarding Fundamentals**
  - Control the relationship of the Center of Mass (CM) to the Base of Support (BOS) to direct pressure along the active edge of the board.
  - Use torsional flex to begin rotation and to engage new edge with progressive pressure throughout the turn. *Pressure toe edge to initiate*
  - Control edge angles through flexion and extension (score card has inclination?)
  - Control rotary (turning/pivoting/steering) with leg rotation separate from a stable upper body
  - Regulate the magnitude of pressure created through board/snow interaction
  - Notes:
    - Goofy – right foot forward
    - Regular – left foot forward (most boarders)
- **Fundamental Snowboarding Results**
  - Consistent speed and control
  - Connected, round and symmetrical turn shapes of varying sizes
  - Smooth transition from edge to edge while keeping board in contact with the snow

Detailed Breakdown of the Fundamentals

- **Balance/Athletic Stance.**

  Maintain Center of Mass (CM) over Base of Support (BOS)

  - Feet approximately hip-width apart
  - Dorsiflex (bend) the ankle forward so both shins maintain forward contact with both boot tongues
  - Knees are slightly flexed
  - Back angle matches shin angle (Dotted Lines)
  - Shoulders are rounded forward
  - Elbows are forward and slightly wider than the shoulders
  - Hands are forward, slightly wider and lower than the elbows
  - Vision forward

  With a correct athletic stance and a side view, your head should be more forward than your feet. This is not a static position (no robot movements).

  NOTE: Solid red line shows a good COM over BOS. This is shown on a male skier. A male skier's COM is high as shown. A female skier's COM is lower so the stance may be slightly modified. (See left photo below)

- **Rotational Control (Twisting)** – simultaneous twisting of the feet, legs, core and other body parts in an effective balanced manner. Turning skis about a vertical axis.
  - Upper body pelvis and above, lower top of femur down.
  - Leg Rotation – simultaneous turning the legs in opposition to the upper body. Leg rotation at the hip creates a separation between the upper and lower body.
  - Counter Rotation - Upper body turns in one direction as the lower body turn in the opposite direction. It is quick, explosive movement, delivers a strong sudden turning force. Start or finish a turn.

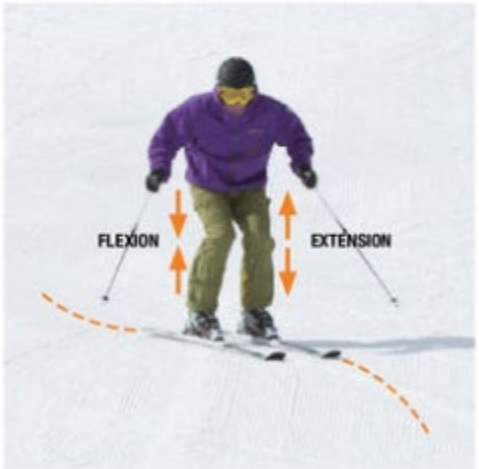
- Upper Body rotation - Turning the upper body until the skis begin the turn. Not preferred, inexperienced skiers. Upper body should maintain the CM over the base of support.

- **Edge Control (Tipping)** – Simultaneous tipping of the skis with lateral movement starting at the ankles and weighting the outside ski. Edge angle is based on amount of tipping and pressure to the snow and ski edge (Magnitude). With the correct stance and angulation, the snow should be pushing from the entire length of the ski from tip (shovel) to tail.
  - Inclination - Lateral movement of the CM toward the center of the turn
  - Angulation - Laterally tipping and flexing certain parts of the body, more than others, to form angles between body segments.
  - Hip and knee angulation. Hip angle at the hip joint. Knee lateral and rotational motion.

- **Pressure Control (Bending)** – Manage the distribution of pressure along the length of the ski
    - Flexing and extending movements of legs and core, redistribution of weight from foot to foot, increase and decrease of edge angles, turn shape and size.
    - Three distinct functions: 1) control the distribution of pressure along the skis length, from the tip to tail 2) control pressure from ski to ski with pressure directed toward the outside ski 3) regulate the magnitude of pressure acting on the base or edge of skis through the interaction with the snow
    - Along Skis Length. Fore and aft pressure along the length on the ski can be controlled by moving the CM, moving the BOS or a combination of both.
    - Ski to ski. Skier must move the CM toward the inside of each turn and direct the balance toward the outside ski. Flexion of the old outside leg (new inside ski) and extension of the new outside leg (new outside ski) is one method of directing pressure from one ski to outside ski

PHOTO 1.17: A common element in good skiing is that pressure moves from outside ski to outside ski.

PHOTO 1.18: Flexion of the old outside leg and extension of the new outside leg is one method of directing pressure from outside ski to outside ski.



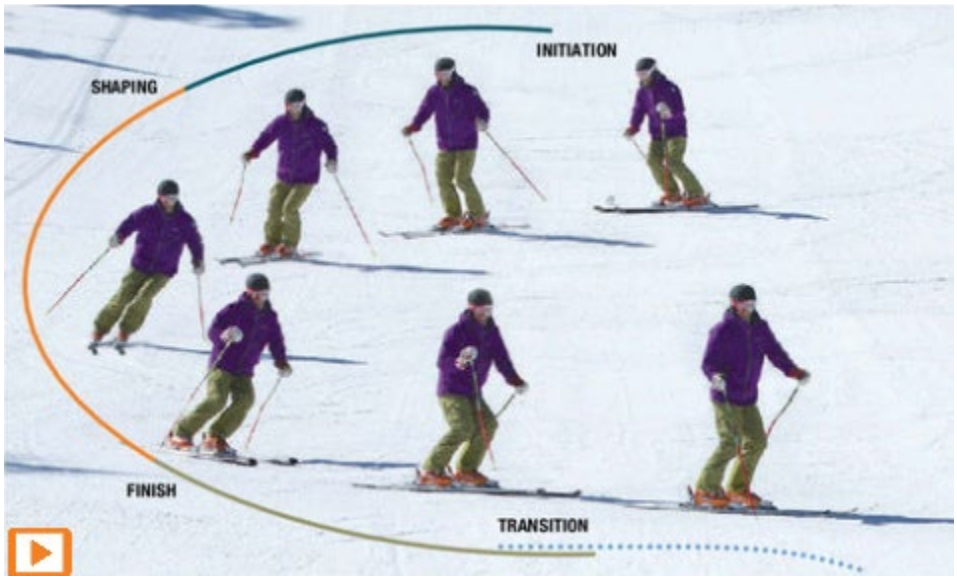
- **Magnitude of Pressure** - The most direct means of managing the overall magnitude of forces in a turn is to increase or decrease the rotation or edge angle of the skis. Up Unweighting, a quick extension of the legs produces a momentary reduction of pressure (hopping). Down Unweighting, a quick flexion of the legs produces a momentary reduction of pressure (suddenly steep upside of a bump). Retraction. Absorption.

PHOTO 1.20: Flexion of both legs at differing rates is a common method of directing pressure from outside ski to outside ski in dynamic short turns or in variable terrain.

- **Movements of the body, three planes**. Sagittal Plane (left, right) – fore and aft movements. Frontal Plane – lateral movements. Horizontal Plane – upper and lower, rotational

PHOTO 4.1: Movements of the body can be described in three planes of motion.

- **Phases of a Turn –** Turns are divided into three phases: initiation, shaping and finish. Transition occurs at the end of the finish stage and into the new initiation phase.
    - **Initiation Phase** is the beginning, approximately top third of the turn.
    - **Shaping** is the middle third of the turn just before to just after the fall line.
    - **Transition** is the final third of the turn where the skier prepares for the new turn or new initiation phase.



- **DIRT.** DIRT equals turn size
    - **D**uration – length of time a movement occurs.
    - **I**ntensity – amount of power given.
    - **R**ate – speed of movement. Edging movements occur at a faster rate in short radius turn than long.
    - **T**iming – when the movement occurs. Edge skis at turn initiation or delay the timing and not edge until the shaping or finish phase
- **MODDS**
    - **M** – Motivation. Identify skier's goals/motivations. Understand emotional/motivation/physical/ and cognitive goals of the student.
    - **O** – Observe. Physically watching the skier.
    - **D** – Describe. Objective description of what you observe. Movement analysis model, qualitative and objective terminology (DIRT), common terms
    - **D** – Determine. **Cause and Effect**. Relationships between the body movements and ski performance prioritize.
    - **S** – Suggest. A prescription for change. Clear and relevant prescription for change.

[1]**Information and photos in this section are compliments of PSIA/AASI and its Instructors.**

SECTION 7 – MOVEMENT ANALYSIS (ON HILL AND VIDEO)

- Identifying body movements and actions of the skis on the snow is a ***critical*** part of your preparation
- The Movement Analysis Process and Skill Concepts listed below will assist in how to analyze movement with all disciplines. By watching videos in the Central Division Video library and actual skiers/snowboarders on the hills, you will make your observations to ensure you are developing a proper analysis.
- Reference the Central Division video library to practice these skills. *https://www.nspcentral.org/asevideo.php*

The Movement Analysis Process and Skills Concept[1]

- PSIA standard model for movement analysis involves:
  - Observation of movements
  - Evaluation of cause
  - Effect relationships to create a prescription for a change in movement patterns.
- Three basic skiing skills:
  - Pressure control
  - Rotational control
  - Edge control
- **Pressure Control** refers to managing forces acting on the skis, both how the snow pushes on the skis base and the skier pressuring their boot. To develop their skills, skiers must learn how to control the pressure distributed along the length of their skis and, from one ski to the next, and adjust the overall magnitude of forces acting on the skis.
- **Rotational Control** refers to how the skis turn. Skiers must learn how to rotate their skis to control where the skis are pointed.
- **Edge Control** refers to how the skis are tipped on and off their edges. Skiers must learn how to control the edges of the skis through increasing and decreasing the angle of the ski on the snow.

Movement Analysis Process

- **Observation** - During this phase you will identify specific body movements to observe. When watching our students, it can be difficult to identify the underlying cause and effect relationships involved. As you observe it is important to frame your observation on one specific movement rather than many at the same time.
- **Evaluation** - This phase helps you assess your observations and distill complex technical information into a digestible conclusion. As you evaluate you will compare the student's current performance (real) versus the optimal performance (ideal). As you observe your

students and identify an intended outcome you will start to compare your student's performance (real) to the performance that would be optimal (ideal).

- **Prescription** - As you observe and evaluate you will move towards prescribing information and feedback on simple changes they can make that will help them to move towards ideal skiing for the specific movement being analyzed. Throughout this phase you will provide your student with feedback using common strategies to improve their skiing performance.

Keys to Observing and Evaluating Performance

Accurately observing your student's movement will create a foundation for making comparisons between real and ideal ski movements. Here are the four keys to observing and comparing the performance of a skier:

Observe and compare one outcome or skill at a time (defined on the next page).

Identify the phase of the turn that an action happened (for skills analysis) and compare phases of the turn or one turn to the next if helpful

Compare what the skier actually did (how they skied) against your interpretation of the ideal.

Create a relevant and accurate assessment of a skier's performance.

Establishing a Baseline

An instructor needs to be able to make sense of what they see in someone's skiing so that they can communicate an accurate and relevant description to a student, another instructor, trainer, or examiner. If you want to do this successfully every time, you need to do a couple of things. First, you ought to be able to explain how you evaluate skiing. That means describing and explaining the baseline for your analysis. Put another way, what is the picture you have in your mind of the ideal skiing performance? Whether you realize it or not, this becomes the standard by which you measure all skiing, which allows you to do the second important thing — compare the skiing you are watching against the ideal picture in your mind. This lesson will explore how to do those two things.

Ideal vs. Real – Establishing and using your movement analysis baseline

Understanding your personal baseline is essential to the movement analysis process. Especially, when describing why you think one skier performs better than another. Your baseline represents what is ideal. Real is what you observe your student or another skier doing. Establishing a baseline standard for analysis will help you do 3 things: evaluate specific aspects of a skier's performance, limit what you need to watch and create a relevant and accurate description.

Let's explore three essential steps for identifying and using a movement analysis baseline:

Select criteria (either skills or outcome) you will use this as a baseline to analyze a skier.

Identify observable ideal body and/or ski performance characteristics related to that baseline standard.

Compare what the skier actually did against your baseline.

Choosing a Baseline for Your Analysis – Outcomes and Skills

Skiing is unique and personal, and there are more and less effective ways to ski. This means there are multiple baselines or perspectives one can use when analyzing skiing. Let's explore how to use two different perspectives to assess skiing: outcomes and skills.

Note: Outcomes and skills are completely interrelated. Creating a specific outcome requires a skier to apply a specific blend of skills. Applying a specific blend of skills will create a particular outcome.

Read about each of them below:

Outcomes/Skills

A skills perspective on skiing considers the details within that big picture. Skills are the result of predictable and tangible movements. Here are there things to consider when analyzing skills:

The Skis/Snowboard – what is the specific action of the skis/snowboard?

The Body – what are the specific movements of the body?

Cause and Effect – How did specific body movement impact the skis' performance?

Analyzing Outcomes – Ideal Examples

It is important to know examples for the ideal execution of certain outcomes so that you can better recognize real examples. Here are some examples:

Ideal Turn Shape

Ideal Turn Connection

Ideal Speed

Speed: consistent and offensive

Analyzing Skills – Ideal examples

Ideal Pressure Control

Pressure control refers to managing the forces acting on the skis. It is essential to acknowledge and understand that the snow pushes on the skis and the skier making the skis and skier turn. Here we are highlighting two types of pressure control:

Fore/Aft Pressure

How a skier controls the distribution of pressure from the tip of the ski to the tail. NOTE: Ankles have the greatest effect on fore-aft balance.

Outside Ski Pressure

How a skier controls the pressure from ski to ski.

- The upper body balances against the outside ski.
- Hands and arms are disciplined and aid in lateral balance.
- Hands are level.
- The skis bend at or prior to the fall line.

Ideal Rotational Control

Rotational movements can occur in several different places in the body. We will briefly look at two movements that skiers commonly used to control where the skis are pointed and how each affects the skis' performance: leg and body rotation.

Leg Rotation

Leg Rotation refers to how the legs move in the hip sockets to control the rotational movement of the skis. The movement originates in the hip and extends down the leg and includes turning of the upper leg (femur) and the lower leg below the knee. As the ankles, knees, and hips are flexed, abduction and adduction also play a significant role. Since our legs are slightly bent when we ski, all of these movements are used in combination most of the time. Leg rotation is the most versatile and effective option for rotational control of the skis. We can control how long the skis are turning, the amount that they turn, the speed they turn, and when they turn. Likewise, we can control each ski independently of each other to assist with turning.

Upper-Body Rotation

Upper- body rotation is pretty much what it sounds like. The skier turns their upper body first, and then the legs turn in the same direction. This can be a large movement that includes the head, torso, shoulders, and pelvis and it can be much more subtle where the skier only slightly turns just the pelvis and part of the torso before the legs turn. Upper-body rotation is typically an undesirable movement since it is hard to control the duration, amount, rate, timing and intensity of the skis turning. Likewise, it usually results in the inside ski starting to turn before the outside ski. Once the skis start turning, it can be difficult to control them, and the skier will have to use another movement to resist the skis from turning.

Ideal Edge Control

Edge control refers to how the skis are tipped on and off their edges. Skiers must learn how to control the edges of the skis through increasing and decreasing the angle of the ski on the snow. Controlling the edging movements of the skis requires skiers to learn how to put the skis both on and off edge. In order to turn, we must tip the skis onto their edges and then maintain the edge angle we want.

To link turns, we must learn how to change edges smoothly and progressively so as not to disturb our balance. Skiers learn how to control the skis' edge angles on the snow through a combination of two movements: angulation and inclination.

Using angulation and inclination in combination is the trick to effective edge control movements. Skiers will use a combination of these movements to determine how long they want their edging movements to last, how much or little edge angle they want to have, how quickly they want to tip the ski on or off edge, and when we want to change the edge angle. Too much of one or the other in the wrong context won't allow us to balance on our edges while we turn.

Inclination without Angulation

Inclination with Angulation

The two types of angulation commonly used in skiing are knee angulation and hip angulation. Knee angulation is when the lower leg is tipped more than the upper leg with an angle at the knee. Hip angulation is when the legs are tipped more than the upper body with an angle at the hip socket. Using the feet and legs like this to control edge angles is a precise way to control the skis. The tipping movement in the legs is actually a combination of tipping the feet and legs, flexing the knees and hips, and the different types of leg rotation. Through using this combination of movements, a skier can avoid putting too much lateral stress on the knee while maintaining a precise manner of controlling the edge angle.

Rotational Control

Another place that provides visual body cues of ideal rotational control is the finish of the turn. The skier's legs should be turned across the fall line more than the upper body and the upper body should be aimed towards the next turn. As you view the pictures and videos below, here are some starter questions to reflect on while observing the skier's rotational control:

- Is the upper body rotating before the lower body or is the upper body stable with active rotation of the legs?
- How much does the body rotate and where does the movement occur during the turn?
- Do both legs turn the same amount, at the same time, or in the same direction?

Ideal Rotational Control

Real Rotational Control (Not so good)

Fundamental Characteristics of Ideal Rotational Control:

When looking for visual body cues of ideal rotational control, look at the finish of the turn: the legs should be turned across the fall line more than the upper body and the upper body should be aimed towards the next turn. The skis rotation is controlled with leg rotation separate from the upper body.

Edge Control

The tipping of the skis is relative to the length or longitudinal axis of the skis. Here are some start questions to reflect on as you analyze a skier:

- What parts of the body are tipping?
- What part(s) of the body is/are angulating?
- How much are they angulating?
- What is the combination of angulation and inclination?
- Is there too much of one over the other?
- Do both legs tip the same amount, at the same time, or in the same direction?

Ideal Edge Control

The lower body is *tipped to the inside of the turn more than the upper body.*

Real Edge Control

The whole body is *tipped to the inside of the turn.*

Fundamental Characteristics of Ideal Edge Control:

When looking for visual body cues of ideal edge control, look at the shaping phase of the turn and notice that the lower body (orange line) is tipped to the left more than the upper body (blue line).

Pressure Control

Ideal Use of Pressure: Fore-aft

When looking for the ideal use of fore-aft pressure, look for the front of both skis to press against the snow at the initiation of the turn. The skier creates fore-aft pressure through flexion and extension to control the bend of the skis. Here are some starter questions to reflect on while observing a skier's fore/aft pressure control:

- Are the ankles, knees, and hips joints flexing?
- Is the spine slanted forwards, upright, or aft?
- Are some joints flexed more than others or are the joints flexing proportionate to one another
- Does the flexion of the joints move throughout the turn or does the skier remain fixed and the joints don't flex and extend?

Ideal Use of Fore-Aft Pressure

Real Fore-Aft Pressure

NOTE: Analyze from the side to get the best view of fore-aft position of the skier.

Pressure: Outside Ski

When looking for ideal pressure control skills, the outside ski should bend more than the inside ski, and both skis bend from front to back while (in most cases) maintaining contact with the snow. Here are some starter questions to reflect on while observing the skier's pressure control:

- What is the relationship between the two legs? Is one more bent than the other or do they look similar?
- How much or little flexion is between the two legs and where does it occur in the turn?
- Where is the upper body tilting?
- Where is the upper body facing?

Ideal Pressure: Outside Ski

Real Pressure: Outside Ski

Notes for below:

Longer outside leg (more pressure on outside ski), shorter inside leg (less pressure on inside leg), head in front of feet, good angles between lower back (Strong stance)

[1]**Information and photos in this section are compliments of PSIA/AASI and its Instructors.**

SECTION 8 – ADDITIONAL SKILL SETS AND EXERCISES

Before you use these skills and exercises, there are a few things to keep in mind.

- The Central Division Website has a Skills Development Section with links to PSIA-C videos of several exercises listed below. Here's the link: https://psia-c.org/movement-learning-activities/
- Choose the appropriate terrain type for the exercise. Steeper terrain, places with blind spots or busy areas may hinder your ability to perform these exercises.
- Before you start any exercise, always beware of your surroundings and look up and around the hill before you start. Safety First!

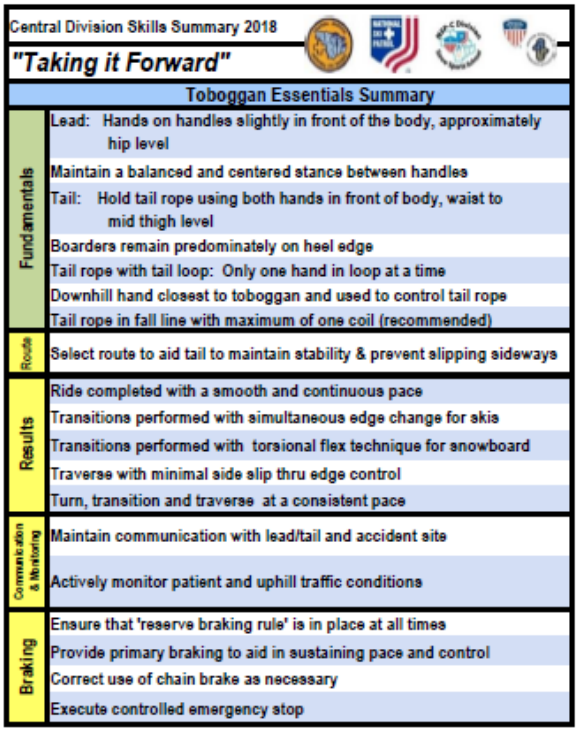
- **Athletic Stance** - hand/arm position, rotation, edge control and pressure drills
- **Hop Start** - before you start run or exercise, hop in an athletic stance to stack your body over your skis
- **Shuffles** – Traverse across the run shuffling your skis forward and aft, keeping your body balanced over your feet and continuing this from turn initiation through the apex of the turn and transition to the new turn.
- **1,000 Steps** - – Traverse across the run continuously making small steps with your skis, keeping your body balanced over your feet and continuing this from turn initiation through the apex of the turn and transition to the new turn.
- **Garlands** - From the straight run use tipping/rolling movements of ankles/feet to begin to increase the edge angle of the skis. As the skis tip onto edge, turn both legs to the steer skis into a guided/skidded arc.
  • Guided/skidded arc is controlled by a blend of tipping/rolling movements of ankles/feet and turning movements of the legs in the hip sockets. The rate and intensity of these movements affects the size and shape of the guided/skidded arc.
  • From the guided/skidded uphill arc, use tipping/rolling movements of ankles/feet to release and change the skis' edges. Once on downhill edges, turn the legs in the hip socket to steer the skis back toward the fall line.
  • Repeat. Practice in both directions
- **Pivot Slips** - Skier pivots their skis 180 degrees from a sideslip to a sideslip facing the other direction. Skier maintains a consistent path of travel down the fall line. This activity may be modified to use either extension or retraction movements.
- **Falling Leaf** - From a side slip in the fall line, use feet and legs to steer skis back and forth across the hill. The skier maintains the same directional orientation while the skis move forward and backward. A swooping Z-shaped pattern with coordinated blending of skills will help maintain speed control and allow the skier to maneuver as desired across the hill.
- **Fan Progression** - Traverse, shallow to steeper arches. Tipping/edging to develop turn shape, balance on outside ski.

- **Parallel Turn** - Round turn shape controlling speed. Edge control, rotational and pressure.
- **Parallel Turn of Varying Size** - Hourglass – wide to narrow, narrow to wide. Focus on adjust direction, intensity, rate and timing of skills
- **Hockey Stop -** Skier pivots their skis 180 degrees into a sideslip and then engages their uphill edges to stop while maintain their balance over their skis
- **Railroad Track Turn** - Tips both feet to make two clean and parallel tracks. Help develop balance on the outside ski and refine tipping/edging to develop turn shape. Transition smoothly from one set of edges to the next.
- **Carved Parallel Turns** - Body weight bends the ski to arc with minimal to no skidding.
- **J turn** – Begin with going down the fall line, initiate a turn (you'll decrease in speed), continue with the turn until you gradually decelerate and stop. The turn will create J shape.
- **White Pass turn** - These turns are skied from finish phase through the initiation and early shaping phase with only one (the same) foot/ski on the snow. After the fall line, the skier begins to lift the inside ski off the snow. The skier finishes the turn balanced on the outside ski and initiates the turn on this same ski (which becomes the new inside ski). The outside ski is returned to the snow prior to the fall line of the turn, and pressure is transferred to the outside ski once it has returned to the snow.

SECTION 9 - REFERENCES/RESOURCES

- NMR website
  - ASE Materials *(Currently under development)*
  - *Links and Movement Analysis Video Library* *(Currently under development)*
- Central Division website
  - https://www.nspcentral.org/ase/ Contains links to ASE Program Overview, ASE Flowchart, ASE Technical Vocabulary, ASE Recommended Study Materials, ASE Scorecards, ASE Six Benchmarks for Success, Senior Evaluator Video Notes and ASE Videos
  - http://www.nspcentral.org/ Skills Development Card (from the "Home" page, click on the arrow next to the "Programs" tab. Click on the "Skills Development" tab then click on the "CLICK HERE" link. In the second paragraph, click on the "Skills Summary Card" Link or it is located at the end of this Study Guide. This is an excellent pdf document with Skiing and Snowboarding Essentials Summary with the 5 fundamentals and Toboggan Essentials Summary. I would highly recommend printing and laminating this as a pocket guide.
- Alpine Skills Development Workshop (ASDW)
  - Snowsports Trainers Workshop
  - Other Programs TBD
- PSIA website
  - https://www.thesnowpros.org/ - if you are not a member of PSIA, you can still access some of Education Materials. On the PSIA home page, click on the "Shop" tab on the toolbar. Click on "Catalog" then the "Education Resources" box. There are several teaching manuals available for Alpine, Snowboard and Nordic in print, digital or a bundle with both versions. PSIA Members have full access to the site with multiple options including E-Learning Courses like Level 1 Alpine and Snowboard and Alpine Movement Analysis plus the Matrix. The Matrix has 100's of videos for all disciplines (Alpine, Snowboard, Telemark, Cross Country and Adaptive) including Side Slips, Pivot Slips, S/M/L Radius Turns, Effective Edge movements, Angulation, Flexion/Extension and much more.
- Recommended Study Materials (available on the PSIA website) http://www.thesnowpros.org/shop/catalog/education
  - 2018 Teaching Snowsports Manual (Product 109B – Bundle – Non-member $49.95) (Highly Recommended - This is the newest manual and contains detailed information on the five fundamentals.)
  - 2015 Alpine Technical Manual (Product Number 134 - Bundle – Non-member $44.95) (Good information for Alpine)

        - 2015 Snowboard Technical Manual (Product Number 138 – Bundle – Non-member $44.95) (Good information for Snowboarding)
        - 2015 Telemark Technical Manual (Product Number 137 – Bundle – Non-member $44.95) (Good information for Telemark)
- Other
    - You Tube Videos – Several PSIA videos are available on You Tube by typing in what you are looking for such as Pivot slips, Side Slips, etc. NOTE: Make sure they are PSIA videos for the best examples.

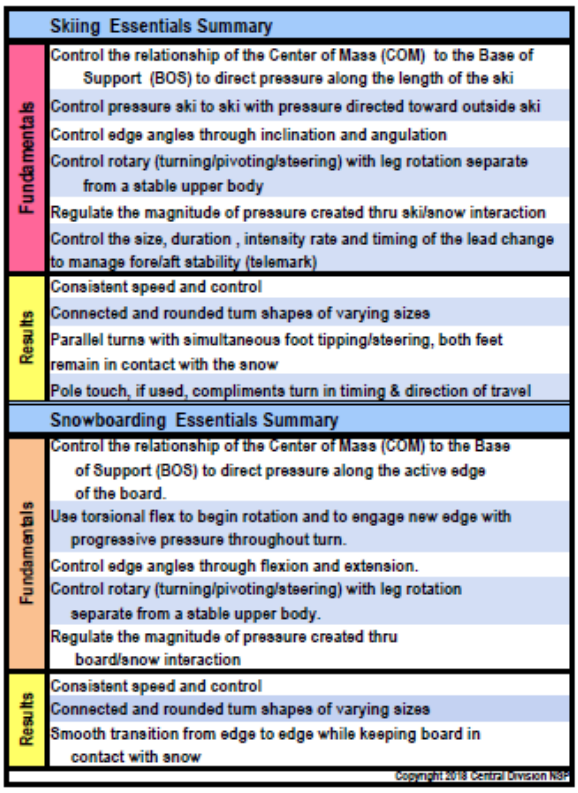


Central Division Skills Summary 2018

"Taking it Forward"

Toboggan Essentials Summary

Fundamentals	Lead: Hands on handles slightly in front of the body, approximately hip level
	Maintain a balanced and centered stance between handles
	Tail: Hold tail rope using both hands in front of body, waist to mid thigh level
	Boarders remain predominately on heel edge
	Tail rope with tail loop: Only one hand in loop at a time
	Downhill hand closest to toboggan and used to control tail rope
	Tail rope in fall line with maximum of one coil (recommended)
Route	Select route to aid tail to maintain stability & prevent slipping sideways
Results	Ride completed with a smooth and continuous pace
	Transitions performed with simultaneous edge change for skis
	Transitions performed with torsional flex technique for snowboard
	Traverse with minimal side slip thru edge control
	Turn, transition and traverse at a consistent pace
Communication & Monitoring	Maintain communication with lead/tail and accident site
	Actively monitor patient and uphill traffic conditions
Braking	Ensure that 'reserve braking rule' is in place at all times
	Provide primary braking to aid in sustaining pace and control
	Correct use of chain brake as necessary
	Execute controlled emergency stop

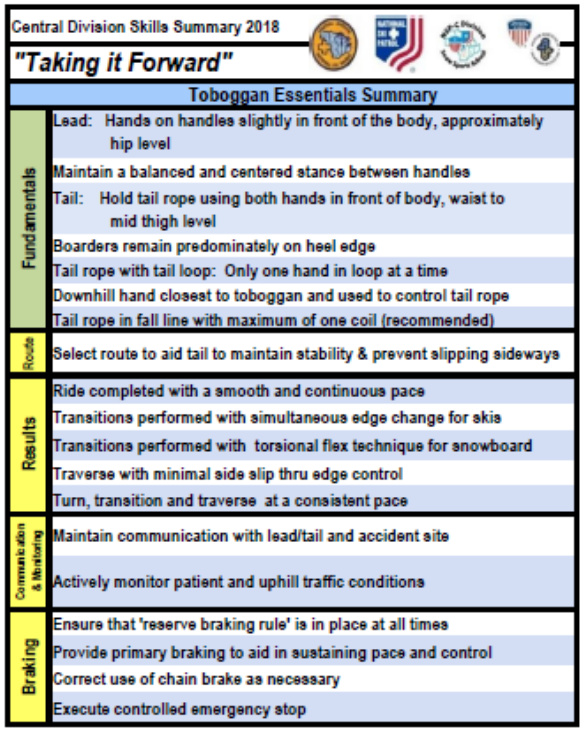


Skiing Essentials Summary

Fundamentals	Control the relationship of the Center of Mass (COM) to the Base of Support (BOS) to direct pressure along the length of the ski
	Control pressure ski to ski with pressure directed toward outside ski
	Control edge angles through inclination and angulation
	Control rotary (turning/pivoting/steering) with leg rotation separate from a stable upper body
	Regulate the magnitude of pressure created thru ski/snow interaction
	Control the size, duration , intensity rate and timing of the lead change to manage fore/aft stability (telemark)
Results	Consistent speed and control
	Connected and rounded turn shapes of varying sizes
	Parallel turns with simultaneous foot tipping/steering, both feet remain in contact with the snow
	Pole touch, if used, compliments turn in timing & direction of travel

Snowboarding Essentials Summary

Fundamentals	Control the relationship of the Center of Mass (COM) to the Base of Support (BOS) to direct pressure along the active edge of the board.
	Use torsional flex to begin rotation and to engage new edge with progressive pressure throughout turn.
	Control edge angles through flexion and extension.
	Control rotary (turning/pivoting/steering) with leg rotation separate from a stable upper body.
	Regulate the magnitude of pressure created thru board/snow interaction
Results	Consistent speed and control
	Connected and rounded turn shapes of varying sizes
	Smooth transition from edge to edge while keeping board in contact with snow



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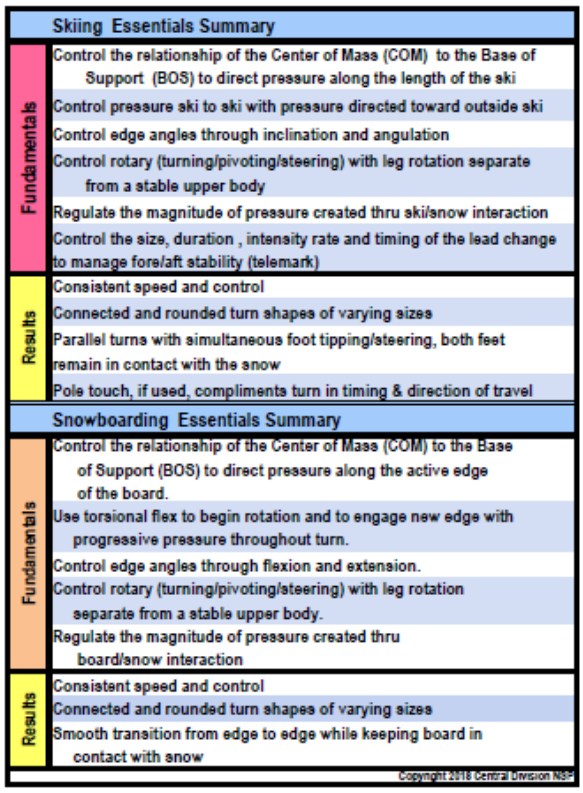
Tail rope with tail loop: Only one hand in loop at a time
Downhill hand closest to toboggan and used to control tail rope
Tail rope in fall line with maximum of one coil (recommended)

Route
Select route to aid tail to maintain stability & prevent slipping sideways

Results
Ride completed with a smooth and continuous pace
Transitions performed with simultaneous edge change for skis
Transitions performed with torsional flex technique for snowboard
Traverse with minimal side slip thru edge control
Turn, transition and traverse at a consistent pace

Communication & Monitoring
Maintain communication with lead/tail and accident site
Actively monitor patient and uphill traffic conditions

Braking
Ensure that 'reserve braking rule' is in place at all times
Provide primary braking to aid in sustaining pace and control
Correct use of chain brake as necessary
Execute controlled emergency stop



Skiing Essentials Summary

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Control pressure ski to ski with pressure directed toward outside ski
Control edge angles through inclination and angulation
Control rotary (turning/pivoting/steering) with leg rotation separate from a stable upper body
Regulate the magnitude of pressure created thru ski/snow interaction
Control the size, duration , intensity rate and timing of the lead change to manage fore/aft stability (telemark)

Results
Consistent speed and control
Connected and rounded turn shapes of varying sizes
Parallel turns with simultaneous foot tipping/steering, both feet remain in contact with the snow
Pole touch, if used, compliments turn in timing & direction of travel

Snowboarding Essentials Summary

Fundamentals
Control the relationship of the Center of Mass (COM) to the Base of Support (BOS) to direct pressure along the active edge of the board.
Use torsional flex to begin rotation and to engage new edge with progressive pressure throughout turn.
Control edge angles through flexion and extension.
Control rotary (turning/pivoting/steering) with leg rotation separate from a stable upper body.
Regulate the magnitude of pressure created thru board/snow interaction

Results
Consistent speed and control
Connected and rounded turn shapes of varying sizes
Smooth transition from edge to edge while keeping board in contact with snow

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NOTE: There are two cards (front and back) above. You can print this page and cut them into 4 pages then place the Ski and toboggan cards back to back. Laminate the cards and you'll have to cards to carry on hill for your review!

Information and photos contained in this document are compliments of PSIA/AASI, National PSIA/AASI Demo Team members and its instructors, NSP Central Division and the Central Division ASE members.