



ROCKY MOUNTAIN DIVISION
 Professional Ski Instructors of America
 American Association of Snowboard Instructors

ASB How Adaptive Tools & Techniques Impact the Snowboarding Fundamentals

Understanding the Snowboarding Fundamentals and how using adaptive snowboarding tools and techniques can impact the fundamentals can support a positive learning partnership and student assessment. The following are charts and descriptions to help illustrate how the fundamental relationships change in different scenarios and situations.

BOARD PERFORMANCE	SNOWBOARDING FUNDAMENTAL RELATIONSHIPS
Pressure (longitudinal) Nose to Tail	Control the relationship of the center of mass to the base of support to direct pressure along the length of the board.
Pressure (lateral) Edge to edge	Control the relationship of the center of mass to the base of support to direct pressure along the width of the board.
Pressure (vertical) Up and down	Regulate the magnitude of pressure created through board/surface interaction.
Tilt	Control the board's tilt through a combination of inclination and angulation.
Pivot	Control the board's pivot through flexion/extension and rotation of the body.
Twist	Control torsional flex of the board using flexion/extension and rotation of the body.

To show how these principles may work in practice through an adaptive lens consider some of the following questions in working with an adaptive student:

- 1) What board performances are best suited to the rider's profile?
- 2) What tactical adjustments or trade-offs are appropriate to create a successful outcome?

Consider the following rider for example in assessing their strengths against the board performances and core fundamentals.

Example: A 30-year-old with a double above the knee amputation (AK) who is fit, healthy, and has full range of motion and strength. He uses prosthetics that are directly attached to his custom-fit bindings on the snowboard. He also uses a standing outrigger in his lead hand.

BOARD PERFORMANCE	POSSIBLE STRENGTH	RATIONALE
Pressure (longitudinal)	Possible	With limited lateral hip range, regulating pressure in this direction will rely on tipping the torso and outrigger along the length of the board. It will be easier to apply pressure to the nose of the board than the tail due to the use of the lead outrigger.
Pressure (lateral)	Likely	This will likely be the strongest pressure move he can make by moving his center of mass (CM) across the width of the board. Range and strength will be affected by the prosthetic-binding interaction.
Pressure (vertical)	Possible	The above-knee amputation will limit the amount of pressure to be applied in this direction. Based on the rider's profile in having full strength and range of motion, he may be able to affect vertical pressure.
Tilt	Likely	Similar to pressure (lateral), moving his CM across the board can create tilt. Check the prosthetic-binding interaction for rigidity in holding the board on edge.
Pivot	Likely	Using the outrigger in front can help the board pivot, using the area around the lead foot as a pivot point.
Twist	Possible	The inability to independently flex joints in the nose and tail will make twisting the board a challenge.

When planning a lesson with this student, it will be helpful to understand which fundamentals will be core strengths that can lead to success. In this case, we have the assets of two types of pressure, tilt, and pivot. Knowing this will enable you to adapt any movement to your rider's successful outcome.

Adaptive Assists and Tools



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Physically assisting a rider through using “the Dance” technique is a useful assist for many types of abilities and diagnoses. Understanding how using the dance can impact the fundamentals can help illustrate how the snowboarding fundamentals are impacted by various tools and techniques.

How Does the Dance Impact the Snowboarding Fundamentals?

BOARD PERFORMANCE	LIKELY IMPACT	WHY?
Pressure (longitudinal)	Possible	Riding slightly ahead or behind the rider and pulling in either direction can minimally impact their longitudinal pressure. Indirectly, giving tactile cues or lending only a lead or rear hand to the rider can encourage them to shift weight fore/aft, but the act of dancing does not directly impact nor guarantee this outcome.
Pressure (lateral)	Likely	Push/pull assistance aids the rider in controlling lateral pressure.
Pressure (vertical)	Unlikely	Giving tactile cues can encourage the rider to alter their vertical pressure, but the act of dancing does not directly impact vertical pressure, nor guarantee this outcome.
Tilt	Likely	Push/pull assistance aids the rider in achieving a larger tilt angle by moving their CM over the heel/toe edges and by providing support to learn their balance points on both edges.
Pivot	Possible	Pushing with one hand and pulling with the other can generate a rotation through the riders’ body as a chain of events eventually resulting in a pivot of the board.
Twist	Unlikely	Giving tactile cues can encourage the rider to dorsiflex/plantar flex, but the act of dancing does not directly impact twist nor guarantee this outcome.

Introducing tools to the lesson can impact what snowboarding fundamentals can be more easily achieved or less likely to occur. Use the following chart to learn how



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dance extensions such as Hula Hoops, Sno-Wings, and I-Teach bars impact the snowboarding fundamentals.

How do Dance Extensions Impact the Snowboarding Fundamentals?

BOARD PERFORMANCE	LIKELY IMPACT	WHY?
Pressure (longitudinal)	Possible	The Instructor can guide the rider to shift CM towards the nose or tail of the board by shifting the device that direction.
Pressure (lateral)	Likely	The instructor can immediately shift the CM toward the toes or heels by shifting the device that direction.
Pressure (vertical)	Possible	With the Sno-wing™ the instructor can direct the rider's CM up and down due to the attachment to the rider. It is more difficult with a Hula Hoop or Ski Pal due to the rider holding on with their hands.
Tilt	Possible	While assisting with their balance, the instructor can encourage increased or decreased tilt through laterally adjusting the rider or encouraging the rider to do so with support.
Pivot	Likely	Pivoting the rider's upper body will result in the lower body shifting. The Sno-Wing will immediately rotate the lower body as it is connected to the rider's hips. The rider can also independently change and enhance their pivot by holding the device stationary with the arms and swiveling their feet around a point.
Twist	Unlikely	These devices do not directly influence twist.

These charts help demonstrate how different tools and techniques impact the snowboarding fundamentals, helping you understand why you might introduce a tool or technique. Look at what snowboarding fundamentals your rider can easily achieve and what fundamentals are less present and use this framework to decide why you might introduce a tool or technique into the learning partnership.