

CSU and EMBK Skate Progression and Drills

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These notes describe the basic skate progression and drills for skiers at all levels, including novices. The progression and drills draw heavily on various USST materials, with modifications and extensions for teaching novice and youth skiers, and benefit from the feedback of numerous coaches and skiers.

Core Skate Progression

A. Without skis or poles

1. Stand in basic athletic position (BAP) (“keeper” position, tennis ready position):
 - Shin and back are parallel.
 - Pelvis should be tilted back
 - Ankles and knees bent
 - Shoulders relaxed and rounded.
 - Turn toes, knees, and hips outward.
2. Add forward lean from ankles with feet angled apart in skate position.
3. Rock in place (maintain connection through upper body, core, and legs – this should be a true rock, not step or lifting of feet), maintain BAP.
4. Step from side to side:
 - Keep pelvis steady as if it were a bowl holding water. It should not tip forward-and-back nor side-to-side.
 - Thrust the hip forward.
 - Maintain a “pelvic-tilt” with a constant stomach crunch.
 - Keep the hips at the same height above ground. No up and down motion.
 - Keep the body facing forward.
 - Push off to the side leaving leg fully extended
 - Keep a deep ankle bend on the weighted leg.
5. Jump from side to side.
 - Follow same directions as above for side-to-side stepping.
 - Focus on jumping laterally, not vertically
 - Land on squarely with hips over foot – you should be able to balance on one foot without further adjustment in the landing position.
 - Don’t pull the un-weighted leg under the body when transferring the weight.

- Skiers need to be able to master the transfer of weight from side to side with a good jump with no skis or poles. If they can't do this drill then they will not ski correctly. This is an easy place to correct flaws and a safe place (no fear of falling) to master correct BAP and movement.
6. Add in arm motion.
- Once the skier has mastered the correct lower-body movement then you can add in arms.
 - Arms should be held high in the “ready” position. The skier does a short, quick downward pole motion as they kick off to jump to the other foot.
 - Start with V2-alt timing, then try V2.
 - Pay attention to: landing with hips over foot, lateral jump, stable core, vertical zipper.

B. On Skis without Poles

7. Stand in basic athletic position (BAP) (“keeper” position, tennis ready position):
- Shin and back are parallel.
 - Pelvis should be tilted back
 - Ankles and knees bent
 - Shoulders relaxed and rounded.
 - Turn toes, knees, and hips outward.
8. Add forward lean from ankles with skis angled apart in skate position. This should be like turning on a switch – as the weight shifts forward the skier starts to move forward. Younger skiers should continue this through to forward front fall.
9. Rock in place (maintain connection through upper body, core, and legs – this should be a true rock, not step or lifting of feet), maintain BAP, “zipper vertical.”
10. Combine leaning forward from the ankles and the rock to prevent the skier from doing the splits and turns this forward motion into skate stride.
11. **Soccer Kick (Forward Flick) Drill.**
The “soccer kick” is a forward flick of the foot. Pretend you are tapping a soccer ball located at your toe down the length of the ski to the ski tip. Do not raise ski from snow – the motion is a forward flick of the foot. Practice one foot, then the other.
- The goal of the “soccer kick” is to achieve a lateral stride. Other mnemonics are “push from the heel” or “push from the middle of your foot.” What is to be avoided is a forward stepping motion, or a backwards (not lateral) push.

12. Basic No-poles Drill and Extensions

Ski with no poles, with hands on hips or hands in front in “holding bowl of water” position. Mastering this drill is essential for proper skate technique. Focus items:

- Lateral push (cues: soccer kick/forward flick/push from heel/push from midfoot).
- Have feeling of complete release and relaxation of lower leg after the kick: achieve “lateral kick and release.”
- Complete weight transfer: hips and upper body come over to land on top of the glide ski.
- Core stability: vertical zipper, shoulders square in direction of motion (no upper body twisting or bending)
- Shoulders should be relaxed and gently rounded
- Start with low intensity, low tempo, long glides. Only add intensity once the basics are mastered. Be careful about increasing tempo – make sure weight transfer is complete.
- Additional pointers:
 - Keep pelvis steady as if it were a bowl holding water. It should not tip forward-and-back nor side-to-side.
 - Thrust the hip forward & up/maintain a “pelvic-tilt”. If skier squats, have them stop and stand in an erect position and restart drill.
 - Keep the hips at the same height above ground. No up and down motion: the kicks should be lateral not vertical.
- Extensions:
 - Add in deep ankle bend on the weighted leg: forward position is achieved through ankle bend combined with forward/up hips and vertical femur.
 - Hold poles vertically held in front of face (hands at waist level). Focus on keeping poles vertical – same as keeping zipper vertical (no tilting).
 - Hold poles horizontally comfortably at waist level in front of you – balance poles on forefinger (don’t grasp). Use the poles as a feedback mechanism to see that shoulders are not tilting side to side or upper body rotating. Poles should stay horizontal and perpendicular to the direction of travel.
 - Try holding your hands in front of your face, elbows bent, like a boxer in a defensive posture. Ski along easily with only a slight kick and a long glide. Keep the hip up!

C. On Skis with Poles

13. Locked and Loaded Drill (“Robot Drill”).

- Assume the high-hands position at the top of V2 poling motion. (A good mnemonic is to say “Put your hat on.” The motion of pulling on a ski hat puts the hands and arms in the correct spot). Then, the position is locked. No arm or waist movement is allowed!
- The skier falls forward onto the poles (the load part) and pulls himself forward using only the abs. Many skiers tend to cheat and use their arms quite a bit – the coach must emphasize that the arms and shoulders are frozen in place. If done properly the athlete will really feel the abs, and especially the lower abs,

pulling the hips under him. If done properly, speed over snow is quite slow because of zero shoulder/arm/waist follow-through.

- Cue: Pull your bellybutton up to your nose (good for keeping skiers from sticking out their butts)

14. **Locked and Loaded into V2 (“Robot into V2”).**

- Start in Locked and Loaded for 5-7 poling motions, then add in baby steps side to side in rhythm with the arms. Keep the footwork to a minimum so that the arms are driving the tempo – keep the motions tight.
- As comfort increases begin to stride but maintaining the locked and loaded/robot position. As comfort increases further allow follow through with arms and a larger stride.
- As the athlete increase adds in full upper-body motion, she should be doing the V2, but with full engagement of the abdominals. Hands should come up nearly to chin height, shoulder width apart, elbows 90° or tighter; arm motion is forward and backwards (no lateral motion) with swing from shoulders.

15. **Introduction to V2-alternate**

About half of new skiers will accomplish Robot into V2 as their first combined poling-striding skate experience, about half will not. The other route into skating is directly into V2 alternate.

- Practice the V2 alternate rhythm with the instructor, lateral weight transfer/step and poling motion while standing in place. Once this is mastered, start skiing at a very slow energy level, focusing on combined rhythm.
- Once the timing is mastered you can focus on hand and arm position and core engagement. Hands should be in the “high hands” position – “pinky in the eye” – slightly more than shoulder width apart, vertical forearms when fully “up”, elbows 90°.
- Rhythm should have rest phase of V2-alt in the “up” position, with hands never pausing in the “down” position. High hands in the right place facilitate core (upper abs) engagement with hips remaining forward.

16. **Introduction to V1**

- Adopt correct hand position for V1: “answer the phone” for hang arm, in front of sternum for lower arm.
- Practice crunch in this position.
- Start V1. This is most easily done at very low power, with very little follow through (think Robot Drill), on flats or very gradual uphill. Goal is to accomplish correct timing.
- Once timing is accomplished add in follow-through and progress to moderate uphill.
- Things to watch for:
 - Different skiers naturally will want to have left or right hands as hang arm. If a skier’s timing is off – either obviously by 180° or the timing

just seems awkward – having them switch the hang arm usually solves the problem.

- Make sure kick is lateral (cues: soccer kick/heel push).
- Hips should come fully over the glide ski
- Extensions:
 - V1 with hang arm pole only, other arm should simulate poling motion. This helps get timing and upper body position right.
 - Feel nearly equal power from both arms – the upper body power should be a slightly offset double pole, not falling/collapsing on the hang arm
 - Practice V1 on the flats with low power and long glide – goal here is complete weight transfer (hips up and over the glide ski)
 - On moderate uphill, focus on ankle bend with vertical femur/hips forward. Knee compression combined with lateral kick and release yields the powerful skate kick.

On Snow No-Pole Drills

Follow the Leader Drill

Competitive junior athletes, especially the boys, have a huge problem doing drills where they go slow and concentrate on good form and balance. Instead they race each other and immediately start thrashing like a bunch of hockey players fighting for the puck. So, we must harness their competitive spirit. Create small groups (3 or 4) of skiers of similar speed and ability. The leader tries to hold his or her glide as long as possible and the followers have to match the glide length. If you can out-balance the skier ahead or behind you then you “win”. Use a small loop and have the leader switch on each circle. One key skill to work on doing this drill is sticking out the kicking leg and using it as a counter-balance while balancing on the glide leg.

Boxer/Cheerleader Drill

Initiate the movement onto the gliding ski with a punching motion of both hands forward in the direction of travel. This drill is essential for training the correct timing of the V2. Don't swing the arms back, just let them come back to the starting position after each punch. This drill must be mastered for a proper V2.

Fire Your Guns Drill

One of the hardest parts of skiing is keeping the hips driving forward instead of letting them float back and sticking out the butt. Using the motion of a Western gunslinger pulling out his six-gun and shooting a varmit is a good way to get the skier to tuck his or her hips under her. First practice while standing still and check that everyone can get the motion down. Then, try it while moving and fire a gun as you step onto the ski.

Skate very easily without poles. Focus on:

- Deep ankle bend
- Steady balance
- Kicking forward – visualize skiing toward 12 on a clock face. Kick to 2 and 10 o'clock.
- Hips forward over the ski
- Upright and quiet upper body
- “Fire your guns” to keep the pelvis tucked

Skate without poles Drill

Use normal arm motion. V1 up hills, V2 on flats and gradual ups, and V2 Alternate on flats and gradual downs.

V2 and V2-Alternate Drills

Wiggle-Wiggle

Doing V2-alternate, pause with your hands high to wiggle your fingers and to say “wiggle wiggle.” You should see your fingers wiggle out of the corner of your eyes. While wiggling make sure your hands are in the right place – the high hands position, with forearms vertical or slightly ahead of vertical and at “put on your hat” height. Saying “wiggle wiggle” also gets the skier to pause long enough to glide – they won’t have time to say “wiggle wiggle” if their weight isn’t fully transferred.

Hop Drill

In this drill the skier takes a hop and then as the ski lands does the pole motion and kick all together. This teaches the correct timing of simultaneous firing of all muscles in arms, torso, and legs for maximum speed.

Stratton Swing

For Advanced skiers: Once the skier has mastered the timing of the V2 he or she will be looking for ways to apply more power to the stride to gain more speed. Better skiers open up their upper bodies with a rhythmic swinging motion as they ski. It’s a difficult move and can easily make the skier put his or her butt backwards. Watch a World Cup Sprint video of Andy Newell to see it in action.

Ride the Glide Drill

To improve glide: On every third stride hold the glide position for a count of two.

V1 Drills

Hot Foot Drill

Start by standing in one place. Slide the feet one at a time along the ground in a quick motion like the ground is hot and you have to keep sliding your foot off the ground. The effect should be to make you do a very light slide on each foot. It's okay to move forward as you do it. This drill teaches the skier to feel the sensation of a gliding ski leaving the snow. During the full kick the skier should be pushing off a gliding ski and never leaving the ski "stuck in the mud". A mental image that works for some people is to think of trying to pop balloons by poking upward with the tip of each ski.

In a V position try sliding the skis forward. Using only forward motion kicks you should be able to move forward. It's a miracle!

Nina's Diagonal Stride Skate Drill

Skate without poles. Use your arms like in classic. When you step onto your left ski raise your right hand straight ahead with hand up to face height. Work on rhythm and glide. This is particularly effective for improving V1 because it gets the skier up and onto the ski instead of sitting back.

Lee Borowski's "The Drill"

When doing a V1 try to make the poles land before the foot (versus at the same time). This will force a more powerful, deep stride. This is an important drill for good skiers who lack power in their stride.

V1 Saddle Drill

USST uses the analogy of sitting on horseback in a saddle to convey proper V1 position and weight transfer. Here's a drill they showed to Alex Jospe at a clinic: Use four different ways of skating up a short hill (no poles):

- Click heels going up the hill (causes you to stall out)
- Take a big step up the hill (causes you to put the heel down first)
- Keep the feet really wide (getting better)
- Keep the feet wide but putting down the toe first

V1 on Both Sides

Competent skiers should be able to V1 with the poles landing on either side. Do easy repeats on a small hill with the poles landing first on the left for the whole repeat and then on the right for the whole repeat. If everyone masters this then have them switch halfway up.

Agility Drills

Figure 8 Drill

Place two cones (or other markers) 10 meters apart (conveniently this is 5 ski lengths when on snow). Have skiers do 3 full figure eights around the cones for time. Great for agility and control.

Frisbee Relay Drill

Create 2 person teams and have elimination sprint races where they skiers have to throw the Frisbee back and forth 3 or 4 times. This will develop total body awareness and the “swivel-head” necessary for surviving a tight sprint situation.

Drill Checklist

Drill	
BAP with no skis or poles	
Jump side to side with no skis or poles	
BAP with skis and forward pressure, no poles	
BAP, pressure, rock, no poles	
In place soccer kick	
Ski with no poles just rocking with soccer kick	
Same but with arms high	
Follow the leader	
Boxer/Cheerleader	
Fire your guns	
Stable upper body with poles as guides	
Skate without poles	
Locked and loaded (Robot)	
Wiggle-wiggle	
Hop	
Stratton Swing	
Hot foot	
Nina's diagonal stride	
Ride the glide	
V1 Saddle	
V1 both sides	
Figure 8	
Frisbee relay	

Definition of Terms

V1: So named because you pole only to one side so the marks left in the snow show only one set of pole plants for every two ski marks (the “V”). Both poles and one foot are set down at the same time. Remember these keys:

- Push equally to both sides with the legs – there is no “strong” or “weak” side anymore
- Kick forward, not back
- Maintain a deep ankle bend. At 30 degrees the skis just float up the hill
- Keep the skis sliding throughout the kick – don’t let the foot “die” in the snow
- Keep the body facing forward with the pelvis steady and tucked – no tilting or rotating
- Keep upper body upright. Compress just the top part of the torso like a stomach crunch when poling. Don’t drop or rotate the shoulders.

V2: Named because you pole on each kick leaving two pole-plant marks in the snow for every ski mark. Remember:

- Keep a steady ankle and knee bend – no up and down motion.
- The deeper the ankle bend then the easier you will balance and the more power you will have for your kick.
- Compress just the upper torso when poling
- Kick forward.
- Push the hip forward over the ski for maximum glide
- “Fire your guns” to keep the pelvis tucked and driving forward
- Upward motion of the poles must be *quick!*

V2 Alternate: So named because we use the motion of the V2 in the legs, but only pole to one side. Initiate the technique by a large arm swing and a commitment to gliding on one ski. Remember:

- Again, the ankle bend is the key to balance and a long glide
- Kicking forward is hard, but key to maintaining momentum
- Keep hips square to the direction of travel