

LEARNING SNOW CLIMBING with Robert Speik

OBJECTIVES:

To learn the basics of snow travel and snow climbing using the mountaineering ice axe as an aid; respect for the dangers (hidden to the uninformed) of the environment of snow and ice; and correct response to changing conditions and mishaps.

The order of instructional emphasis is:

1. Respect for easily climbed steep slopes, the changeable nature of snow and ice, mountain weather and trailless terrain.
2. Correct technique for using boots in step kicking, diagonal traversing and fall line ascents and descents. Steady aerobic pace for the specific climbing group, balance, and rhythm breathing are important factors in avoiding falls on a long climb.
3. Correct technique for using the ice axe as an aid to snow travel and snow climbing.
4. Correct technique for using the ice axe for "self-belay" and for "self-arrest" in the event of a fall. Building reflexes, which can be depended upon during a real fall.

TRAVEL ON SNOW AND ICE (HARD SNOW or NÉVÈ)

Hikers, backpackers and climbers that reach higher elevations will eventually find themselves on snow and ice fields. Often, travel and climbing are best done when hard snow covers difficult terrain: brush, loose scree and talus, cliffs and the like. Snow climbing is not just for the winter, but it may ease the way year-round for the trained climber. Travel on snow can help maintain a steady aerobic pace within the capabilities of everyone in the group. Glissading, or sliding down a moderate slope while under control, is a wonderful way to lose major elevation in minutes. You must learn to "self-arrest" before you attempt to glissade.

A BASIC PREMISS:

Snow is an ever-changing medium. Snow slopes, safe in the morning, may become extremely dangerous in the afternoon. Hard snow may turn soft resulting in steps giving way or dangerous post-holing may occur. Unexpected snow storms or white-out conditions may occur making progress impossible. Warming conditions may trigger rock-fall or avalanches. Slick hard ice can form quickly making any progress dangerous and arrest all but impossible.

Travel across a steep hard snow slope with a thousand feet of exposure, is like walking along the very edge of a cliff, with a thousand feet straight down. A climber falling down a snow slope is slowed only by the nominal friction of clothing and equipment, little different from falling straight off a cliff of like elevation. Hit a bump or catch a crampon and the hapless climber is tumbling or cart wheeling toward rocks, trees or flat terrain below. Broken bones and dislocations and death are likely. The climber must respect the hidden danger of easily climbed snow slopes.

THE MOUNTAINEERING ICE AXE:

Snow travel on slopes requires practiced use of an appropriate ice axe. The mountaineering ice axe is used primarily for balance and to stop a fall before it happens; but also for "self-belay" if a slip occurs and "self-arrest" if a fall should occur. Sometimes the axe is used for step-cutting or as a snow-anchor; it should be strong and balanced but not too heavy. The mountaineering axe

should be long enough to be used as a cane in the uphill hand ascending or descending a slope, normally by traversing. A good way to choose the length of an axe: your fingers should just touch the head with the spike on level ground. The axe must be controlled; make a shoulder leash or use a hand leash purchased with your axe. Purchase a rubber head guard; learn to uncover the pick but keep the adze protected from blunting from possible contact with your face or eyes.

The adze must be thickly taped before any ice axe practice.

THE MOUNTAINEERING ICE AXE CARRY:

Carry the mountaineering ice axe on the trail with the spike forward, pick down, up hill hand holding the shaft at the balance point. It is better to stick your partner in the foot than in the eye. Study the "self-belay" grip and the "self-arrest" grip in the cane position on the illustrations attached. Learn to carry your axe on your pack and also, quickly stowed in your pack harness.

CLIMBING UP A SNOW SLOPE:

Experience tells us that traversing a snow slope is more efficient than climbing straight up. That is why mountain trails switchback up a steep slope. Relatively heavy stiff-soled boots can kick edge steps in the hardest snow. The steps are sliced into the snow, level and perpendicular to the slope. Each climber takes care to kick and improve the steps for those following. The long traditional mountaineering ice axe is shifted to the uphill hand to assist balance and provide a constant "self-belay" point as the spike is pressed into the snow. Often, these steps will be used on the return from the summit; care must be taken down climbing to not break out the steps as the snow softens in the sun. See the illustrations attached to learn the technique of switching hands and turning from one traverse to the next.

Short sections may be climbed straight-up the fall line by kicking the boot tips straight into the snow. The toe steps should be sloping inward, possible only with relatively heavy hard soled boots. Folks with the heaviest boots should go first. Do not make giant steps. The climber should stand up straight, weight on his toes. This is why long straight up ascents cannot be made; the calf muscles will not support hours of standing on ones toes. The ice axe spike is driven into the snow every second step, straight up the slope. The climber is ready to grip the shaft at the shear line of the snow to "self-belay" a slip and avoid a fall and a "self-arrest".

DOWN CLIMBING A SNOW SLOPE:

Care must be taken climbing down to maintain balance and follow the steps and traverses made on the ascent. Do not break out the often softening steps. Keep the axe in the uphill hand. Facing in with the axe in the "self-belay" position, "self-arrest" grip, and climbing straight down the fall line in steeper sections will be safer for most. Just back down, keeping your body away from the slope and your weight over your toes.

In the proper conditions, a climber can plunge-step, heel striking first and sliding, bounding down the moderate slope at a near run. Beware a hard spot that will drop you into a surprise sitting glissade. Beware a soft spot that will trap your leg and snap your bones.

GLISSADING:

This method of descending can be pure joy, dropping a thousand feet of elevation in minutes, under control. Don't glissade a slope you have not climbed up except for short easy stretches that you can fully observe. Sliding over half buried rocks, or rough ice patches can abrade your pants and your buttocks and your tail bone! Wear your expensive Gortex wind or rain pants but be prepared to patch the worn bottom before the next trip. In the summer, let your shorts and butt air dry. In the proper conditions, try a standing glissade, ice axe in the cross-body position ready to arrest when you fall. Learn to "self-arrest" before you try glissading.

LINES OF DEFENSE IN CLIMBING SNOW:

Before you climb forgiving snow or harder snow, or try to glissade, you must learn to "self-belay" and also "self-arrest". **The first line of defense in climbing snow is DON'T FALL. The second is SELF-BELAY. If these fail, you must SELF-ARREST, SELF-ARREST, SELF-ARREST and keep trying to arrest until you stop, one way or the other.**

ICE AXE SELF-BELAY:

SELF-BELAY GRIP:

The "self-belay" grip, with the hand on the adze, enables the climber to push the spike more deeply. This grip became more popular with the advent of the stamped ice axe head with hard edges which are guaranteed to bruise the thumb. The problem is that the grip must be shifted to the "self-arrest" grip, a maneuver that requires two hands and a few moments of time. That is why you will see folks shift to the "self-arrest" grip as the perceived exposure (the pucker factor) increases.

SELF-BELAY ACTION:

The principle of a "self-belay" is to stop a slip before an arrest is required. Well thrust into the snow, the ice axe is gripped by the free hand at the shear line next to the snow as a slip occurs. The axe thus grabbed will hold well even if it has not been deeply pushed into the snow. Study the illustrations of the ice axe "self-belay". This primary technique must be practiced until it is an instant reaction to a slip.

ICE AXE SELF-ARREST:

SELF-ARREST GRIP:

The ice axe "self-arrest" grip differs from the "self-belay" grip. The thumb is curved under the pick, hand over the top of the axe. This is the preferred grip when a fall might occur; the transition from the "self-belay" grip to the "self-arrest" grip requires the use of both hands and a special effort. Study the illustrations attached.

BASIC POSITION FOR SELF-ARREST:

A fall may begin in variations of six different positions: sideways left or right, feet first on stomach or back and head first on stomach or back. The basic "self-arrest" position is the same for all six orientations: shaft and spike pulled down next to the hip, either hand gripping the head of the axe with the pick down, driven into the snow by the weight of the shoulder. Study the illustrations attached.

"APPROPRIATE SLOPES" FOR LEARNING SELF-ARREST TECHNIQUES:

Choose "appropriate slopes" as required for instruction and practice: for snow travel, for snow anchors, for belay activities, for ice axe arrest practice and for safe rest, food and split breaks. The term "appropriate slopes" refers to slopes which in the judgment of the responsible person are suitable for the level of experience of the participants under the snow conditions of the

moment. ALL SLOPES MUST HAVE SAFE RUN-OUTS. All slopes should be tested for safe run-outs by having an experienced person free slide in fast sliding clothes with ice axe at the ready to be used only if the speed is imminently dangerous or the run-out appears to be too short. Such testing should be repeated as snow conditions change. The entire area should be free of rock fall and avalanche risk.

ATTITUDE AT THE PRACTICE SESSION:

Students should not be apprehensive; students should practice to their limits but not beyond. However, gripping the ice axe incorrectly, and bad arrest form can lead to injuries. Students should watch each other and try not to practice with incorrect form or in a slow or weak way because it will be difficult to unlearn bad habits. Aggressive fast effort is preferred. The goal is fast automatic reflexes. An annual practice session is an enjoyable outing, helping the climber and friends.

SPECIAL PERSONAL SAFETY CONSIDERATIONS:

Climbing helmets are required. The adze must be duck taped over a pad or lightly over a rubber axe protector. The pick and spike should not be excessively sharpened. At first, wrap the leash around the hand and axe head to prevent the axe being torn from the hand and let loose upon the slope. Ice axe arrest practice has obvious inherent risks.

FIRST ARREST PRACTICE DRILLS:

On a generally flat area of snow, with a partner, practice all of the “self-belay” and “self-arrest” actions twice, with the axe in either hand. The partner watches closely, describing all of the actions required. Switch places. Practice aggressively.

ESTABLISH AN ARREST RUN:

Kick steps in a line a short way up the proposed slope. One at a time slide down on the back, grooming the slope as necessary. Maintain the integrity of the snow steps. Climb a bit higher and try an un-arrested sitting glissade. As the practice progresses, the run will become longer and faster. As required, check the safety of the run-out on this “appropriate slope.”

ARREST IMMEDIATELY:

Establish the immediate arrest reaction. Have your partner hold you at the top of the run, describe what you must do then go when you are mentally ready. Try to get ten arrests in a fifty-foot slide. You will get more practice and not be as tired at the end of the session.

SLIDE FEET FIRST, ON THE STOMACH IN THE ARREST POSITION:

This is the basic arrest position. Learn the correct grip on the shaft and axe head. Hold tight against the forces of the pick dragging in the snow, perhaps catching on hard sections. Slide down a bit and arrest. Kick both feet into the run and stand up, self belayed. Slide down again. Repeat until you are at the bottom of the slide.

SLIDE FEET FIRST, ON THE BACK, ARREST FROM A SITTING GLISSADE:

When glissading on your buttocks force the shaft and spike into the snow nest to your hip and be sure to hold the pick parallel to the snow so that the shaft striking something hard will not drive the pick into your thigh. Always roll toward the head of the axe. This is hard to learn because you will be leaning toward the shaft pushing down, dragging it through the snow. If you roll the wrong way, the spike will stick, pulling the axe out of your hands. Think about what you want to do before you start the glissade and arrest.

SLIDE HEAD FIRST ON YOUR STOMACH:

Have your partner hold your feet until you are in position and can verbally describe what you are going to do. Hold the axe with the palms down, pick far out from the side of the body ready to be plunged into the snow as a pivot point. Work aggressively to get you feet down hill and into the basic arrest position.

SLIDE HEAD-FIRST ON YOUR BACK:

Have your partner hold your feet until you are in position and can verbally describe what you are going to do. Jab the pick into the snow about at the hip, away from the body, as you sit up and roll toward the arrest-side hip onto the axe. The arrest-side leg goes under the other. All of these steps - planting the pick, starting to sit up, rolling onto the axe side, sliding the axe leg under and arresting - must flow together. Work aggressively to get you feet down hill and into the basic arrest position.

ROPED TRAVEL:

Roped travel is required to protect a tired, injured or inexperienced climber, in high winds and/or reduced visibility, on very steep slopes where simultaneous travel is feasible and where there are hidden crevasses. A team arrest has saved many lives; one team member may be able to stop the slide of the rest of the team. It is important that all members move together minimizing slack. Study the illustrations and practice team travel and team arrests. Do not test the limits of team arrests as someone is sure to be hurt.

ANCHORS:

Climbers may have to be belayed down a steep icy patch to safer snow slopes. Rappels may speed the safe descent of trained climbers. Anchors must be SARENE. Review the illustrations attached for the construction of fluke, picket, deadman and bollard anchors. Do not test the limits of anchors as someone is sure to be hurt.

BELAYS AND RAPPELS IN SNOW:

A rope may be used to provide an upper belay to assist a nervous or unskilled climber or to safely cross a snow bridge or an occasional short icy patch. Often, a safe belay seat can be simply stamped into the snow, and a quick sitting hip belay can be used. Or, the belayer can be tied into one or two snow anchors to provide a bombproof belay. Basic rockcraft techniques are used in snow climbing. A major difference is that snow leader belays can be dynamic, avoiding shock stress to usually weaker anchors.

An important snow climbing technique is the boot axe belay. Fast execution, correct rope handling and belay techniques must be practiced often, over time. The standing carabineer ice axe belay is an alternate quick belay technique. Study the illustrations and practice boot axe belays. Remember, upper belay forces should be minimal if care is taken to keep slack out of the system. Do not test the limits of belays as someone is sure to be hurt.

PRACTICE, PRACTICE, PRACTICE:

Automatic responses are built over time. Snow climbing practice can be an enjoyable outing each year as correct techniques are studied and reviewed. Have fun, be safe! Climb on!

Copyright © 1995-2009 by Robert Speik. All Rights Reserved

Traditional\Seminar_Snowclimbing.doc