MERIT BADGE SERIES

SNOW SPORTS

BOY SCOUTS OF AMERICA®

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"Enhancing our youths' competitive edge through merit badges"

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Note to the Counselor

Like many other outdoor activities, the snow sports discussed in this pamphlet have risks. These risks can be minimized by following the complete guidelines under Winter Activities in the BSA's *Guide to Safe Scouting,* particularly those that pertain to winter-sports safety.

The abridged rules below highlight the guidelines that will help you ensure the well-being of those Scouts under your supervision.

- Use only designated areas where obstacles have been identified and marked, cleared away, shielded, or buffered in some way.
- At all times when Scouts are in the field, maintain direct supervision by two or more mature and conscientious adults (at least one of whom must be age 21 or older) who understand and knowingly accept responsibility for the well-being and safety of the youth in their care. They should be experienced and qualified in the particular skills and equipment involved in the activity and committed to compliance with BSA Winter Sports Safety as defined in the *Guide to Safe Scouting.* The appropriate number of supervisors will increase depending on the number of participants, the type of activity, and environmental conditions.
- Explain the potential hazards of snow sports before engaging in the activity. Make sure Scouts understand and respect the rules of safety and etiquette for snow sports, especially the rules of the local ski patrol. Place emphasis on preventing accidents through adherence to safety measures and proper technique.
- Be sure Scouts wear appropriate clothing and protective equipment, including gloves, helmets, and goggles when appropriate. The use of a helmet is required for snowboarding and downhill skiing.
- Comply with BSA medical requirements as outlined in the Annual Health and Medical Record. Each participant—youth and adult—must have a current physical examination performed by a licensed health-care practitioner who has knowledge of the sport and its particular physical demands.
- Make sure all specialized equipment such as snowboards, skis, snowshoes, and helmets fit and function properly.

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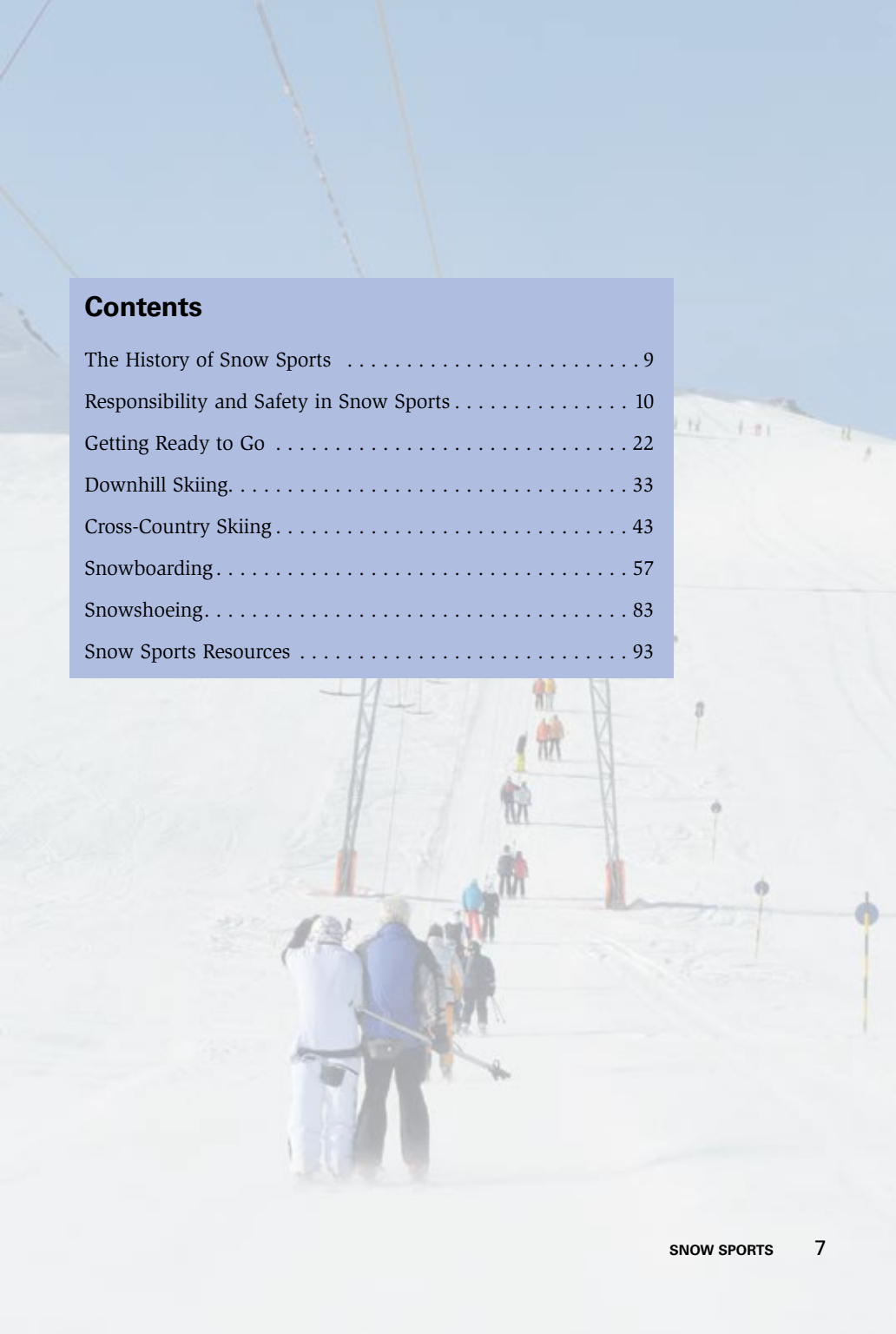
Requirements

Scouts should go to www.scouting.org/merit-badges/Snow-Sports or check Scoutbook for the latest requirements.

Contents



The History of Snow Sports

Scandinavian settlers who came to North America late in the 19th century brought skiing with them and taught others how to enjoy it.

For centuries, people in northern countries faced the problem of getting about in deep snow. Humans needed some means of staying on top of the snow and taking advantage of its slippery qualities, rather than floundering along with maximum exertion and minimum progress. The invention of the ski and snowshoe filled a great need.

Modern skis and ski styles began developing in northern Europe during the 1800s when Sondre Norheim of Norway developed the telemark style of turning with skis that used a free-heel binding system such as that used in modern cross-country skis. The Alpine, or downhill, skiing style was developed in the 1880s, using a toe-and-heel binding piece similar to what is used in downhill skiing today. These 19th-century skis were long and cambered, or curved, to support the weight of a skier on any but the softest snow. They also were slippery enough that a skier could glide down mountainsides and along flat places.

Snowshoes have been around for more than 4,000 years. Humans back then discovered how they could travel more efficiently over snowy areas using footwear that covered a large surface. Modern-day snowshoes have come a long way since the primitive ones made of wood and leather.

Sherman Poppen, a skier from Michigan, invented the Snurfer in the 1960s as a toy for his daughter. This cross between a plywood sled and skateboard deck evolved into the modern-day snowboard in the 1980s.

Skiing, snowshoeing, and snowboarding remain among the fastest and most thrilling ways to travel on foot in snow country. These sports also provide the physical benefits of fresh air, rhythmic action, and strenuous exercise. Best of all, snow sports allow anyone to stay active outdoors during winter.

Responsibility and Safety in Snow Sports

Snow sports hold a special magic. The beauty of the winter landscape dramatically enhances the challenge, fun, and excitement of outdoor activity. But many of the same features that make winter adventures appealing pose special risks. Whenever you are out enjoying the snow, always show courtesy to others and exercise caution and common sense to help reduce the risk of accidents and injuries. Observe the Your Responsibility Code and share with others the responsibility for a great skiing or riding experience.

Your Responsibility Code

1. Always stay in control and be able to stop or avoid other people or objects.
2. Remember that people ahead of you (or below you) have the right of way. It is your responsibility to avoid them.
3. Do not stop in any place where you obstruct a trail or are not visible from above.
4. Whenever starting downhill or merging into a trail, look uphill and yield to others.
5. Use safety devices to help prevent runaway equipment.
6. Observe all posted signs and warnings. Keep off closed trails and out of closed areas.
7. Know how to load, ride, and unload safely prior to using any lift.

This code is officially endorsed by the National Ski Areas Association, National Ski Patrol, Professional Ski Instructors of America, and the American Association of Snowboard Instructors. This is an abridged version of the code.

Wilderness Use Policy

In addition to showing respect for your fellow skiers, snowshoers, and riders, it is your responsibility to show respect for the outdoor environment. When engaging in snow sports, all privately or publicly owned backcountry and designated areas are to be considered "wilderness." Leave No Trace principles must be followed to avoid damaging the environment and to protect it for future generations.

Leave No Trace Principles

The Boy Scouts of America emphasizes these practices for all troops planning to use the wilderness.

1. **Plan Ahead and Prepare.** Proper planning helps keep you safe and helps you avoid unexpected situations. Minimize your impact by finding out in advance about an area's regulations such as limitations on group size.
2. **Travel and Camp on Durable Surfaces.** Use only designated ski trails and campsites to help protect fragile vegetation and communities of organisms.
3. **Dispose of Waste Properly (Pack It In, Pack It Out).** This simple yet effective saying motivates backcountry visitors to take their trash home with them.
4. **Leave What You Find.** Allow others a sense of discovery, and preserve the past. Leave rocks, animals, archaeological artifacts, and other objects as you find them.
5. **Minimize Campfire Impacts.** Use a camp stove instead of building a campfire. The naturalness of many areas has been degraded by overuse of fires.
6. **Respect Wildlife.** Quick movements and loud noises are stressful to animals. Observe wildlife from afar, store food securely, and keep garbage and food scraps away from animals. Help keep wildlife wild.
7. **Be Considerate of Other Visitors.** Help other visitors enjoy their wilderness experience by traveling and camping in small groups, keeping the noise down, selecting campsites away from other groups, and respecting their privacy.

Safety

Snow sports present special safety challenges. Essential ingredients for fun include skill training and an awareness of the hazards unique to the activity you are participating in.

Avalanche Dangers

Avalanches are a serious concern for skiers, snowshoers, or riders whose outings take them into snowy, mountainous regions. An avalanche occurs when snow breaks loose on a slope or when a cornice of snow collapses and tumbles down. Often the sliding snow carries debris such as rocks and tree branches with it.

Your greatest protection against avalanches is knowing where, how, and when they are likely to occur and then planning routes that avoid these danger spots. Indicators of danger include the following.

- Steep terrain. Avalanches usually happen on slopes of 40 to 60 degrees.
- Accumulations of new snow. Avalanches generally occur during or after a heavy winter storm. The danger of an avalanche remains high until the new snow settles, consolidates, and becomes stable.
- Variations in the quality of snow layers, especially if one or more layers are airy, granular, or in slabs. A weak layer of snowpack can allow layers above to break loose and slide.
- Sounds that suggest cracking or settling of the snowpack.

Those who plan to travel where avalanches can occur would be smart to take an avalanche course through the American Institute for Avalanche Research and Education.

If, despite your preparations and judgment, you see an avalanche roaring toward you and you cannot get out of its path, jettison your pack and your skis, snowboard or snowshoes. When the snow hits, move your arms and legs in a swimming motion to keep yourself upright, and try to keep your head above the surface. As the avalanches settles, push away any accumulation of snow from your face to form an air pocket that will allow you to breathe.

While it's always best to avoid avalanche country, an avalanche rescue kit—beacon, probe, and shovel—can be lifesaving if you carry one and know how to use it. Battery-powered avalanche beacons worn by each group member emit a radio signal that can be picked up by the beacons of others. Before departure, make sure all beacons are in good working order. This means they must have good battery power.

Should others in your party be caught in an avalanche, keep your eye on them as long as you can, and note the exact place you saw them last. Hopefully, they will be wearing avalanche beacons—battery-powered lights that emit a radio signal that can be picked up by the beacons of other group members—that will help you find them quickly. If not, listen for their voices and use your ski poles (grip side down) or a ski to probe the snow.

Search quickly. Your chances of saving a person decrease rapidly as the snow settles. When you find victims, use a sturdy short-handled shovel to free them and then provide first aid for shock, hypothermia, and any injuries. (See the First Aid section in this chapter for a discussion of first-aid techniques.)

In springtime, wet avalanches can occur even in consolidated snow packs. Avoid skiing late in the day when warmer temperatures increase the chance of a wet avalanche.

Smart Style

Because snowboard riding in terrain parks has become so popular, the National Ski Areas Association (NSAA), Burton Snowboards, and OVO Helmets have teamed up to educate snowboard riders and freestyle skiers on safety and park etiquette. The Smart Style Terrain Park Safety Initiative focuses on three easy-to-understand concepts.

- Look before you leap.
- Easy style it.
- Respect gets respect.

SMARTSTYLE

Look before you leap means that you should know the park very well before you ride the features. You should always perform an inspection run through the park or pipe to check for any irregularities and changes that may have happened since you rode it last. You need to know that the landing zone is clear before you hit any feature. You should use a spotter on any feature where you cannot see the landing. The spotter will use signals to indicate whether it is safe for you to proceed.

Never stop in the NO Zone of any feature that is the potential landing and run-out of that feature.

To signal that the feature is clear, a spotter will circle his or her arms overhead.

To signal that a feature should not be used, a spotter will cross his or her arms overhead.

Don't be embarrassed to be clear and loud when calling out your drop. Doing so helps keep you and other riders safe.

Easy style it means you should start with small features and work your way up slowly to bigger features. Warm up slowly, especially when the snow is hard, to allow your muscles to become warm. Monitor your energy levels as you ride, and know when to quit. That way, you will avoid overdoing it and risking injury.

Respect gets respect is a motto you should apply to all stages of your park experience—from the lift line to the features. There are rules and procedures in the park, and it is important to understand how to follow them. When you are ready to use any feature, get in line and call out your drop by yelling "Dropping!" This lets everyone know that you are next to go over that feature or enter the pipe, and it will eliminate any confusion. Once the first rider has ridden away from the feature, the next person can call out "Got next!" and drop in.

Accidents and Emergencies

Despite taking the necessary precautions, accidents do sometimes happen. If you are on the scene at an accident, you should know how to proceed to get help for victims as efficiently and safely as possible.

Warning other people on the hill or trail about an injured rider also helps signal the ski patrol.

First, see if the person is injured. If the person appears to be hurt, cross a pair of skis at least 20 feet uphill or place your snowboard, bindings down, above the person to create a marker. Never remove the injured person's equipment, because this could cause further injury.

Next, alert someone responsible, such as a ski-area employee, and advise that person of the accident. You may need to ask a passing skier or snowboarder to call the ski patrol or other authority. Be sure the person you send for help can identify the location of the accident. If you do not know the name of the trail or location, look for a landmark of some sort. If possible, tell the messenger what the probable injuries are so that he or she can report the information to the ski patrol.

Keep the injured person warm, comfortable, and calm. Watch for signs of shock. It may help to strike up a conversation and reassure the person that help is on the way. Stay with the injured person until help arrives; the ski patrol or other authorized persons may have questions only you can answer.

Shock

When a person is injured or under great stress, the circulatory system may fail to provide enough blood to all parts of the body. This condition, called *shock*, may accompany any serious injury occurring in snow sports. It can be fatal. Symptoms include pale, moist, clammy, or cool skin; weak and rapid pulse; weakness; shivering; thirst; nausea; and shallow, rapid breathing. Because of the risks and uncertainties that may accompany a snow-sports injury, every injured person should be treated for shock.

1. Summon medical help.
2. Keep the victim lying down with the feet slightly elevated.
3. Prevent loss of body heat by wrapping the victim in blankets or warm clothing.
4. Keep the airway open, and perform rescue breathing if needed. If the victim is conscious, give water.

See the *First Aid* merit badge pamphlet for details on how to perform rescue breathing.

Make it a practice while skiing or riding to keep an eye out for trail markers and telephones. Then you'll be able to reach help more quickly in an emergency.

Reporting an Accident

Be aware of the ski area's procedure for reporting accidents. Make it a habit to check with the local ski patrol for instructions on accident reporting before you head out.

At Alpine ski resorts, one common method of reporting accidents is to send someone from your group to the bottom of the nearest lift and inform a lift operator. Remember to include important details: the exact location of the accident, the type of injuries, the number of people hurt, and their conditions.

First Aid

Snow sports, like other activities, have their own set of precautions and unique risks. The conditions described here represent those for which any safety-conscious person should be prepared. You should perform first aid only if help from the ski patrol or trained medical personnel is unavailable.

Hypothermia

Hypothermia occurs when the body is losing more heat than it can generate. It can strike at any time when a person is not dressed warmly enough. Wind, rain, hunger, dehydration, and exhaustion increase the risk.

Staying found while you are in the outdoors helps keep you and your companions safe. Especially if you plan to go in the backcountry, be sure you have a map and compass and know how to use them. For more information, see the *Scouts BSA Handbook for Boys* or the *Scouts BSA Handbook for Girls,* and the *Fieldbook.*

The following symptoms are typical of hypothermia.

- Coldness and numbness
- Fatigue, confusion, and irritability; poor judgment
- Stumbling and/or falling
- Sleepiness; loss of consciousness

To treat a hypothermia victim:

- Get the victim to a shelter and into dry clothes.
- Warm the person by zipping him or her into a sleeping bag.
- If the victim is conscious, give high-energy foods and warm liquids.
- Place water bottles filled with warm fluid in the victim's armpit and groin areas.
- In cases of advanced hypothermia, help the victim breathe warm, moist air.

If no warm shelter or other heat source can be found, the victim should be pressed closely to one or more people so heat can be transferred through direct skin contact. Be ready to provide additional first aid, and seek medical care for the victim.

The best thing to do is to prevent this potentially deadly condition. Eat well before you go out, and dress and equip yourself for the worst weather. If the weather begins to deteriorate, cut your outing short and head back. Do not try to brave out a storm. Use your head, and you and your companions will have a safe and more enjoyable tour.

Remember to take frequent breaks, and drink plenty of water to help prevent dehydration.

Drinking plenty of water while on the slopes will help ensure that you stay hydrated.

Overheating and Dehydration

Overheating occurs when the body cannot keep itself cool enough. Although it is more common in warm environments, overheating in cold weather can occur when a person is doing strenuous physical activity and is wearing layers of warm clothing. If a person feels dizzy, faint, nauseated, or weak; develops a headache or muscle cramps; or looks pale and is sweating heavily, the person is suffering from *heat exhaustion*.

To treat heat exhaustion, have the person lie down. Loosen and remove some clothing so the person

begins to cool down, but be careful not to cool too quickly and risk chilling. Have the victim sip water. Recovery should be rapid. If the condition worsens, get medical help.

Heatstroke is the life-threatening stage of heat exhaustion in which *dehydration* (body-water loss) has caused body temperature to rise to a dangerous level. A person suffering from heatstroke stops sweating, has an extremely rapid pulse, and may be disoriented or unconscious. Relieve the victim immediately by immersing the body in cool water or applying cold packs. When the victim is able to drink, give plenty of water. Treat for shock and seek emergency medical help.

Sunburn

Although *sunburn* is more commonly associated with summertime activity, the risk of severe sunburn is very real on a sunny winter day. Cool air may keep you from feeling the sun's heat, but do not ignore your own health and safety. Cover up and apply sunscreen to any exposed areas. Remember that reflected sunlight or glare from the snow or ice can be worse than direct exposure. Shield your face and give special attention to protecting your eyes with appropriate goggles or sunglasses that offer protection from ultraviolet radiation.

Concussion

A **concussion** is a brain injury, caused by a blow to the head or by a sudden change in motion of the head, in which the brain bounces rapidly back and forth inside the skull. A person does not need to be knocked out to have a concussion. Some signs are disorientation, slurred speech, nausea, sensitivity to light or noise, and sleepiness. Someone with a suspected concussion should be assessed promptly by a medical professional.

Contusion

Contusion is the medical term for bruises—black-and-blue marks that appear, usually caused by a blow from a blunt object. Discoloration is caused by blood leaking into damaged skin tissue. Most bruises are not serious and are easy to recognize and treat. Help reduce discoloration, pain, and swelling by covering the site of a new bruise with a cold compress for 30 minutes.

Bruises that include possible bone injury or any contusions on the head or abdomen coupled with sharp or persistent pain should be seen by a medical professional.

RICE

For sprains and strains remember RICE:

R = Rest

I = Ice

C = Compression

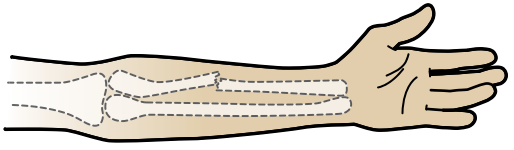
E = Elevation

Sprains and Strains

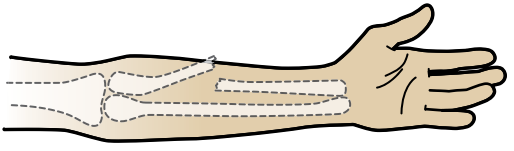
Sprains are relatively common snow-sports injuries. Sprains are caused by twisting, wrenching, or lifting movements that tear or stretch tissues surrounding a joint. Such an injury causes sudden pain and swelling at the joint. There may be some discoloration, and the joint will likely be tender to the touch and very painful when moved. Elevate the injured joint, and apply cold compresses for no more than 20 minutes at a time. The term *strain* usually refers to a less severe joint or muscle injury where tissues are not torn but may have been overextended or overstressed. Treat strains the same as a sprain.

Fractures

More serious than sprains or strains are *fractures,* or broken bones—injuries all too frequently associated with snow sports. There are two kinds: closed (simple) and open (compound). In closed fractures, the broken bone does not tear or puncture the skin. In open fractures, the bone tears through the skin at the break. Signs of a fracture may include tenderness to the touch, swelling and discoloration, unusual or abnormal position or movement, a grating sound or feeling, or a sharp snapping sound or feeling at the time of injury.



Closed (simple) fracture



Open (compound) fracture

To treat a fracture, keep the victim still and quiet and treat for shock. Do not move the injured area. Protect the spinal column by supporting the victim's head and neck in the position found. For open fractures, use direct pressure to control bleeding. In all cases, get medical help to the victim. If the victim must be moved, splint the fracture prior to transport. See the *First Aid* merit badge pamphlet for a discussion of improvised splinting procedures.

Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation, or CPR, is the important first response in the event of a cardiac emergency. Such emergencies are relatively common in strenuous winter activities. For every outing, there should be persons trained in CPR. The Scouts BSA handbooks and the *First Aid* merit badge pamphlet explain emergency skills such as CPR and rescue breathing and explain when they should be used.

CPR is required *only* when someone has no pulse, indicating that the heart has stopped beating. CPR should *not* be performed on someone who has a pulse but is simply unconscious. In this case, rescue breathing, not CPR, is the correct procedure to follow.

Prevention goes hand in hand with mitigation, which means "to lessen in force or intensity" and "to make less severe." By taking precautions to manage risk and the possibility of injury, you can be prepared to anticipate, help prevent, mitigate, and respond to just about any incident that might happen while participating in snow sports.

Getting Ready to Go

Your experience in the snow will be less enjoyable if you head out on an outing without proper clothing or if your level of fitness is not up to the cardiovascular demands of your sport. In addition, you need to familiarize yourself with the use of ski-area equipment and accepted etiquette.

Snowboarding gloves and mittens often have a reinforced palm to stand up to the wear caused by balancing on the snow. Some also have built-in wrist guards.

Wearing proper clothing for winter conditions will enhance your enjoyment of your sport.

Dressing for Success and Safety

Dress in layers when you go out skiing, snowshoeing, or riding. Your first layer should consist of a polypropylene shirt or top and pants or long thermal underwear made of a fiber such as polyester that will wick moisture away from your body. For the second layer, wear a lightweight wool sweater or fleece pullover and pants. Your top layer should consist of water-resistant pants and a jacket to protect you from snow, sleet, or rain and to block the wind.

To keep snow out of your pants, wear a longer jacket that comes down over your waist. Overall-style pants are another option for keeping snow out from around the waist. Choose gloves or mittens made of waterproof but breathable fabrics. Thermal socks will help keep your feet toasty.

Cotton clothing and blue jeans are not recommended because they will not keep you warm when they get wet.

Headgear

Alpine skiers and snowboarders must wear a helmet to protect the head. It will also provide warmth. Nordic skiers and snowshoers should wear a hat for warmth and carry a fleece neck gaiter or face mask to protect the face when it is really cold.

Wearing a snow sports helmet not only provides protection but also warmth. Your helmet should be snug but not tight. If you can move the helmet back and forth while wearing it, then it's too loose and needs to be resized using the adjustable straps and sizing pads. Follow the manufacturer's instructions for fitting a helmet, or get help from a ski or snowboard instructor. Specialty shops also may be a good resource. Remember, if you have a serious fall while skiing or snowboarding, the helmet you are wearing should be replaced.

Eye Protection

Snowboarders and Alpine skiers should wear goggles to protect the eyes from the wind and from harmful solar radiation, and to keep ice pellets or snow from irritating the eyes. When choosing eyewear, select goggles that allow an appropriate range of peripheral vision. Look for wide-angle frames or sport shields. For Nordic skiers and snowshoers, sunglasses or double-lens goggles are a good choice because they do not fog up easily.

Use sunblock and lip balm to prevent sunburn and chapping.

Activities such as running, soccer, biking, and hiking are great ways to build strength and endurance and to keep in shape year-round.

Getting Fit

To enjoy snow sports, you must be in good physical condition. You need strength, endurance, and flexibility—strength for the muscular power needed; endurance for the stamina to enjoy a full day of skiing, snowshoeing, or riding; and flexibility for a complete range of movement and to prevent injury.

Warming Up

A good warm-up can mean the difference between a great experience on the snow and a trip to the emergency room with a torn muscle or something more serious. Be sure to take the time to prepare your body for the sport.

Start your warm-up with some activity to get your muscles ready, such as jogging briefly. Then perform these stretches, holding each one a minimum of 30 seconds up to two minutes.

Calf stretch. Use a wall or something solid to lean into, one leg forward and one leg back. Keep the back leg straight and push into the wall until you can feel the calf stretch. Repeat, reversing the front and back legs.

Hamstring stretch. While standing, bend from the waist with your legs straight. Stretch your hands toward the ground until you feel the back of your legs stretching. Work toward placing your palms flat on the ground.

Quadriceps ("quad") stretch. Stand next to a wall in case you need support. Pull one foot up behind yourself until you can feel tightness in the quad muscle. Repeat with the other leg.

Lower back stretch. Sitting on the ground, cross one leg over the other knee and place that foot flat on the ground. Rotate the torso toward the bent leg. Repeat with the other leg.

Lifts

Alpine snow sport enthusiasts need to learn to use ski lifts to get to the top of a hill. Ski lifts include surface lifts such as rope and handle tows, T-bars, and platter lifts. Surface lifts are used on short, gentle slopes that beginners use when they are learning basic skills. Chairlifts and enclosed gondolas, or trams, are common at snow resorts. When you use surface lifts and aerial chairlifts you may keep your skis on or your front foot attached to your snowboard. When riding in an enclosed gondola, however, you will need to remove your skis or snowboard.

Rope tow

Rope and Handle Tows

To use a rope tow, reach out in front of you to grab the rope or handle. If you are a snowboarder and your back is facing the rope tow, reach over the tip of your board to grab the rope. If you are using a handle tow, you might want to grab the cable between the handles to start so that you do not get pulled off your feet initially. Let the rope or cable run through your hands briefly and then grasp it more tightly. Once you start moving, grip the rope firmly so it does not slide through your hands. At the top, be prepared to move away from the tow to clear the unloading area.

If you are on a snowboard, place your rear foot on your board between the bindings.

T-Bar Lifts

A T-bar lift is a rotating lift that is designed to handle two people. To grab the bar, flex your knees slightly but do not try to sit down or lean back. Stay erect. When you reach the top, the second person off should gently release the T-bar. Quickly move away from the unloading area.

Platter Lifts

Platter lifts (also called Poma lifts) are similar to T-bar lifts, but they have a disk that can be grabbed with the hands or placed between the legs. When you use your hands, you get more control and shock absorption—a real advantage if you are a beginning skier. To grab the platter with your hands, bend your elbows fully and lean back a little so that you can absorb the shock when the cable finishes running out and starts to pull you up the hill. If your arms get tired, try sticking the platter under your armpit. When you reach the top, release the platter gently and quickly move away from the unloading area.

Riding a chairlift

Chairlifts

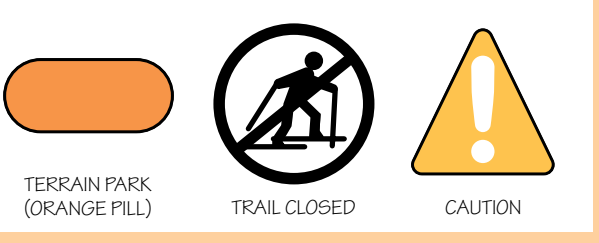
To take a chairlift, read and listen to instructions, move to the marked loading line, and watch for the chair to come up behind you. Hold ski poles in your inside hand and look over your outside shoulder. Once in the chair, distribute your weight evenly and lower the safety bar. Do not bounce or swing the chair. To exit, move to the edge of the chair and get your weight forward on the chair. Lift the bar, position your weight over both feet, and stand up.

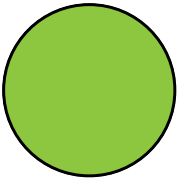
If you are on a snowboard, immediately put your free foot on the stomp pad between the bindings. Do not let your rear foot drag in the snow. Once off the lift, both skiers and snowboarders should focus on balancing and getting to the bottom of the ramp under control. Then, move away from the unloading traffic as quickly as possible.

Trail Marking

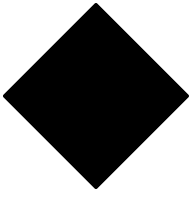
Another thing snow sport enthusiasts need to become familiar with is the international trail-marking system. This system has been designed to help users identify the trails best suited to their level of ability as well as hazards within a ski area. The signs are there for everyone's safety and should always be followed.

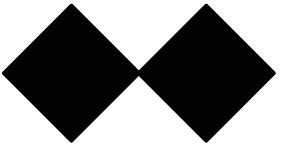
Each ski area determines whether a trail is a green circle (beginner), blue square (intermediate), black diamond (advanced), or double black diamond (very advanced) slope. Nordic and snowshoe trails often use this system as well. Terrain parks use an "orange pill" to identify terrain features. There may or may not be ratings to indicate difficulty.




BEGINNER (GREEN CIRCLE)


INTERMEDIATE (BLUE SQUARE)


ADVANCED (BLACK DIAMOND)


VERY ADVANCED
(DOUBLE BLACK DIAMOND)

International trail markings indicate ski-trail difficulty.

No two slopes or trails are exactly the same, even though they might have the same difficulty rating. Ask an area ski patroller if you have any questions about which trail is right for you. Remember that areas or slopes marked "closed" are marked that way for a reason. Never ski or ride in these areas.

Skiing, Snowshoeing, and Riding Etiquette

Cross-country skiers work hard to establish tracks that other cross-country skiers can use. As a courtesy, snowshoers should avoid those established tracks, walking alongside them to make their own trail instead.

Skiing, snowshoeing, and snowboarding are popular sports, so recreation areas and trails can become crowded, especially after a fresh snowfall. To ensure that everyone out on the slopes and trails has an enjoyable and safe experience, it is important to follow certain rules.

1. **Stay on designated trails.** Trails are laid out for the safety and convenience of all users. Leaving the trail might cause you to encounter unknown hazards and become lost. If you are a Nordic skier or snowshoer and the trail is one-way, be sure to travel in the proper direction. If a trail has two sets of tracks, use the set of tracks on the right side.
2. **Take care when passing.** If you are attempting to pass a slower downhill skier or snowboarder, it is your responsibility to see that you do not collide with the person. Snowboarders or skiers who are below you always have the right-of-way. Snowshoers should also yield the right-of-way to skiers, because they can more easily step aside than a skier. Yield when passing, and when on narrow trails, call out "left" or "right" to indicate on which side you will pass. If you are cross-country skiing or snowshoeing, pass slower skiers and snowshoers on the flat. Call "track!" before you pass so they can yield by stepping to the right out of the track.
3. **Never obstruct other skiers, snowshoers, or riders.** Do not stop in the middle of the trail or run. If you need to rest or regroup, make sure you are out of way of others. Do not descend a hill until others are out of your path.

Sticking to trails that are appropriate for your level of skill will help keep the slopes safe and enjoyable for all users.

4. **Check in and out at ski centers.** Ski area personnel often spend time searching for skiers, snowshoers, or boarders who failed to sign out upon returning.
5. **Use caution in crowded areas.** Slow down and be prepared to stop when you enter a heavily populated area.

Snow Conditions

Snow conditions vary from outing to outing. They may even change *during* an outing, for example, if the temperature rises and the snow starts to melt. Because the condition of the snow can affect your ability to maintain control, it pays to become familiar with various snow conditions and understand how your equipment is likely to respond. Snow conditions you might encounter include the following:

Powder is soft, freshly fallen snow.

Crust is powder that has an icy, crustlike surface. Crust often forms when the sun melts the top layer of snow and then the temperature drops, refreezing the melted layer.

Slush is snow that has started to melt and has a high water content.

Ice is snow that has melted and refrozen a number of times and has become compacted, hard, and slippery.

To accommodate different types of snow, you can make adjustments to the way you ski, snowshoe, or ride. For example, when skiing or riding powder, be sure to keep your weight evenly balanced to keep from sinking. Snowshoers will want to use the kick-step in powder. You may find that crust and slush make turns more difficult to execute and control. Ice is the most difficult type of snow to contend with because of its excessive slipperiness. Your instructor can give you specific tips for coping with various snow conditions.

Finding Your Way With a Map and Compass

Always carry a topographic map of the area and a compass, and know how to use them. Topographic maps use contour lines to represent the three-dimensional shape of the terrain. A compass is a navigational tool that consists of a magnetized needle balanced inside a circular, rotating housing mounted atop a baseplate. The plate is etched with a direction-of-travel arrow. The floor of the compass housing is engraved with an orienting arrow and, parallel with it, several north-south orienting lines.

A topographic map and compass used together serve as a much more powerful aid than either a map or compass used alone. Suppose you want to reach a lake by the most direct route. Place the long edge of your compass baseplate on a real or imaginary line connecting the map points representing your present location and that of the lake. Turn the compass housing until the orienting lines in the compass housing parallel any true-north lines on the map.

Hold the compass at waist level with the direction-of-travel arrow on the baseplate pointing away from you. Without changing the compass setting, turn your body until the compass needle aligns itself with the orienting arrow (for declination-adjusted compasses) or the red tip of the needle points to the declination dot (for declination-marked compasses). When that happens, the direction-of-travel arrow will be aimed at the lake. This is known as taking a bearing for the route to your destination.

Next, look up along the direction of travel. If you can see the lake, you need make no further use of the compass. If the lake is out of sight, though, locate an intermediate landmark toward which the direction-of-travel arrow is pointing—a tree, boulder, or other feature—and walk toward it. Take another bearing, identify the next landmark in line with the direction-of-travel arrow, and go to it. Continue until you reach your destination.

For further details on map and compass use, including how to adjust a compass for declination, see the Scouts BSA handbooks and the *Fieldbook.*

Touring and Backcountry Considerations

Touring and backcountry travel require advance planning. Some basic tips are covered here. You will find more information in the Scouts BSA handbooks and the *Fieldbook*. Carry a flashlight or headlamp and an emergency blanket—in case you are not able to get back before nightfall. Other items your group should take include a multitool or Swiss army knife, waterproof matches, some kind of tinder for fires, a first-aid kit, and, if skiing, extra waxes, a ski scraper, and a cork. If you are taking a longer trip, take an emergency repair kit.

For a one-day trip, plan to make three food stops: at midmorning, noon, and midafternoon. High-energy foods such as sandwiches, chocolate, and oranges are excellent choices. Energy bars or granola bars are great in-between-meal snacks. Bring plenty of fluids, both sports drinks and water.

Your group should leave a trail plan with some responsible person. Give that person the names and addresses of all skiers, where you are going, and when you expect to be back.

Keep spare mittens, gloves, and socks in your pack.

A GPS device, radio, and a mobile phone can be very helpful if you get lost. Remember, however, that mobile phones do not always work in remote wilderness locations. Always carry a map and compass as well.

Downhill Skiing

Most successful downhill skiers start with lessons from a certified ski teacher. Every ski resort offers lessons, and most of the instructors at these resorts are members of the Professional Ski Instructors of America (PSIA), a national organization for ski teachers.

Major Ski Organizations in the United States

The Professional Ski Instructors of America is a national organization for ski instructors. Its American Teaching System has been developed to promote safety, fun, and learning. Another important ski organization is U.S. Ski & Snowboard, the national governing body for Olympic skiing and snowboarding. U.S. Ski & Snowboard provides a pathway for aspiring young athletes to develop their skills through competitions and programs that provide them with opportunities to achieve athletic success. The National Ski Patrol is a voluntary organization that promotes safety in snow sports and trains and certifies volunteer ski patrollers.

A skier is never too good for ski lessons. Serious skiers who have mastered the basics continue to practice to improve skills such as balance, edging, pressure control, and turning. The more you know about skiing, the more you will be challenged to improve.

Helmets Rule!

Scouts participating in downhill skiing activities are required to wear a helmet for protection.

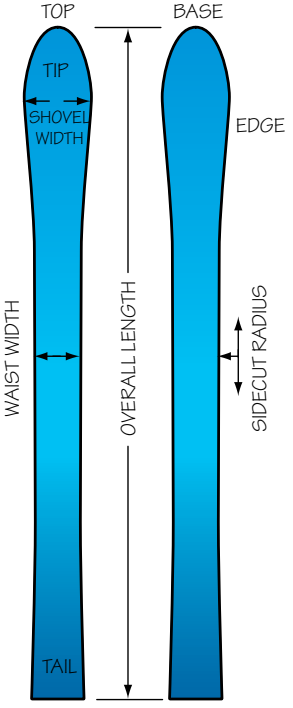
Alpine Skiing Equipment

Before you hit the slopes, you will need to become familiar with Alpine ski equipment. Manufacturers offer a wide range of equipment to meet the needs of skiers ranging from beginners to Olympic athletes. You can rent equipment by the day or week, lease it for an entire season, buy used equipment at a local shop or ski swap, or buy new equipment.

Skis

Most skis are made with either a wood or foam center, or core. Metal and fiberglass are layered or wrapped around the core. The tops of skis are usually sealed with plastic or fiberglass.

The bottom, or base, of a ski is made of a special plastic that must be frequently waxed to help the skis glide smoothly. The metal edges must be kept sharp to help the ski grip on hard snow.



Alpine skis

Alpine skis come in many shapes and are made from a variety of materials. The different shapes and materials used affect the way a ski turns. The shape of a ski is referred to as the sidecut. Since the 1990s, manufacturers have been making skis that are wider at the *tip* (front end) and *tail* (back end) than in the *waist* (middle), giving them an hourglass shape. The shape determines the arc, or *radius,* of the turn the ski will make as it is tipped on edge and pressed into the snow during a turn. Skis with a deep sidecut (a pronounced hourglass shape) allow for sharper turns.

Different types of skis are available for different purposes. Sport or recreational models are generally softer flexing and have a moderate sidecut. They are a good choice for beginners, because they allow skiers to maintain control and turn easily at slower speeds. Performance or advanced skis may vary in stiffness and sidecut, depending on the type of skiing that an advanced skier prefers. For example, racing skis have a deep sidecut for tight slalom turns.

Types of Alpine Skis

There are five basic types of Alpine skis.

Sport models are generally soft-flexing and have a moderate side cut. They are designed to make turning easier at slower speeds for beginner and intermediate skiers.

Carving skis generally have a narrow waist and a wide tip and tail, which helps bend the ski into a tight arc as it is tipped.

All-mountain skis come in a variety of flexes and side cuts. They range from very wide skis with little side cut and a soft flex that are designed to float in the powder, to very straight, narrow skis with little side cut that are designed to ski in the bumps.

Racing skis are designed for high speeds and hard snow. They generally have a stiff flex that can make turning more difficult, but that makes the ski more stable at higher speeds. Racing skis are specialized for turning around gates, and the side cut determines how wide a turn the skis can make.

Twin-tip skis are turned up at the tip and the tail and are designed for performing on jumps, rails, and half-pipes. They can be skied all over the mountain, but their design makes many conditions outside the terrain park more challenging.

Boots

Most boots for downhill skiing consist of a plastic outer shell for support and an inner shell of material designed to mold to the foot for comfort and control. Boots come in a variety of widths, and they have buckles on the outer shell that allow a skier to adjust the amount of tension. Find a pair of boots that fits tightly enough to prevent any heel lift or sideways movement of your foot but not so tightly that it cuts off your circulation.

For most people, a properly fitted ski boot will be at least a full size smaller than their shoe size. Boots need to fit snugly, because any sliding of the foot inside the boot will reduce your ability to control your skis and may cause blisters as well.

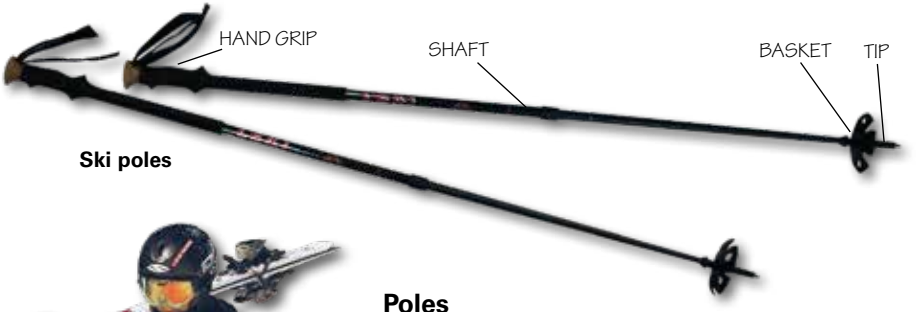
Do not try to make a boot fit by wearing more than one pair of socks.

DIN Standards

The amount of force required to release a ski boot from a ski binding ***(See bindings section on page 36)*** is called the DIN setting and should be adjusted by a certified binding technician when you rent or buy a pair of Alpine skis. To make the correct adjustment, the technician takes into consideration your height, weight, and ability, and the length of your boot. DIN is an abbreviation for Deutsche Industrie Normen, an organization that sets internationally recognized industrial and other standards. In Alpine skiing, adherence to DIN standards has greatly reduced the chances of skis accidentally releasing from bindings and has been an important step in increasing skier safety.

Bindings

Ski bindings attach your boots to your skis. They also play a key safety role because they release your boots from your skis when you fall, which greatly decreases the chance of injury. All bindings are designed to make the skier as safe as possible when skiing. All skiers should understand how their equipment operates; however, bindings should be adjusted only by a certified binding technician.



Ski poles

Poles

Ski poles are hollow shafts made of either aluminum or graphite with rubber or plastic hand grips at the top. Baskets, flat disks located just above the end tips of the ski pole, prevent the pole from penetrating too deeply into the snow. Ski poles assist you in keeping your balance as you ski. You also use them to help you get up after a fall.

The most important aspect of the pole is the length. To check for proper length, stand erect and jab a pole into the snow next to you. If you are inside, tip the pole upside-down and grab the pole underneath the basket. If the pole is the right length, your forearm should be parallel to the ground.

Carrying Skis

The safest, easiest way to carry skis is to fasten them together. Carrying skis together also causes less wear and tear on them—nicked or dented edges have a negative effect on performance.

Most binding systems have some method of keeping the bottom of the skis—the running surface—together for carrying. When you are outside, you can carry the skis over one shoulder, with the poles in the opposite hand for balance. Another method is to place your poles over the other shoulder and under the skis for support. Do not carry your skis this way when you are indoors, because it can be dangerous when you turn. For long-distance carrying, put the pole straps over the skis on each end and slip the baskets under the opposite strap. This makes the poles a sort of handle for the skis.

Alpine Skiing Skills

If you have never skied before, getting started might be a little intimidating. Don't worry. Your nervousness will soon be replaced by excitement.

All skiers, especially beginners, will fall periodically. When you do, try to fall to one side of your skis. Position yourself perpendicular to the fall line, so you will not slide down the slope. Move your hips over your feet and use your poles to push yourself up from the snow.

Most teaching progressions include flatland movements, straight runs, gliding wedges, wedge turns, christies, wedge-christies, skidded parallel turns, and carved parallel turns. A PSIA instructor's teaching progression will be determined by the instructor's ski school and will vary depending on each student's needs.

Flatland Movements

The first step in learning to ski is getting used to walking and moving with your skis on, which is sometimes more challenging than it looks. To practice balancing on skis, an instructor may have you hop in place, rock back and forth, and step from foot to foot. Pushing yourself around the beginning area will help you become comfortable on skis. The instructor might take you on a tour on skis or have you walk in figure eights on skis. All of these exercises are designed to help you work on your balance and get you used to some of the movements you need to learn to become a good skier.

If you try to walk straight up even a small grade, your skis probably will slide backward. One way to move up or down a slope is to imagine the line a ball would take if it rolled down the hill. This line is called the *fall line.* Turn sideways and put your skis exactly across this line. You will find that digging in the uphill edge of your ski into the snow lets you take small steps up and down the hill. This is called *sidestepping.*

CLIMBING

Your first real challenge might not be skiing downhill, but climbing uphill.

Sidestepping is one way to move up and down a hill. Turn your skis sideways across the fall line, then take small steps, digging the uphill edges of your skis into the snow.

Another climbing technique, the *herringbone,* is more difficult than sidestepping, but it can be faster and less tiring. Face directly uphill toward the fall line, and point the tips of both skis outward while keeping the tails together. With the inside edges of both skis digging into the snow, you can duck-walk up the hill.

Skiing Downhill

For your first straight downhill run on skis, you should be on a slope that is very gradual, with either a long flat slope or a slight uphill slope at the end. This slope will enable you to coast to a gradual stop.

For a straight run, it is best to stand in a balanced, athletic stance—feet apart, legs slightly flexed, head up, and hands placed comfortably where you can see them in front of you. Get set, take a breath, and slide!

Your instructor probably will spend some time at this point getting you used to sliding downhill. You should try a variety of straight runs to challenge your balance. These include straight runs while stepping foot to foot, hopping, rocking back and forth—and even skiing on one foot. In a little while these actions will feel very natural.

The easiest way to think of the fall line is to imagine the line a ball would take if it rolled down the hill.

Wedges

Once you are comfortable in a straight run, you are ready to learn to change direction. This will really challenge your balance, and depending on the terrain at the area you are skiing, your instructor may introduce something called a *wedge*.

In the wedge position, you move the skis into a narrow V shape with the tips close together and the tails slightly apart. This stance gives you a wider base of support for balance and can assist you in turning your feet where you want to go. Practice this stance on flat terrain while you are standing still.

You can practice brushing your skis into a wedge, and hopping them into a wedge. Next, try brushing into a wedge while you are gliding from a straight run. As you brush into the wedge, notice that the bigger you make the wedge, the slower you go. This is one way to control your speed, but as you develop your turning skills, you will see that the shape of your turn is the best way to control speed, and if your wedge gets too big, it makes turning more difficult.

WEDGE TURNS

Once you can control your speed and stop on your own, your instructor will show you how to change direction from a gliding wedge. Think of your first turns as long, gradual changes in direction, like doing a straight run with a little bend in it.

Wedge position

Start the turn by simply looking in the direction you want to go. If you want to go to the right, look to the right and gradually take some of your weight off of your right foot. As your balance shifts to your left foot, you can gradually point both feet to the right.

Once you can make a controlled turn to both the left and the right, try increasing your speed and linking turns together using a very small wedge. The first linked turns you try won't be long and gradual like single turns; instead, you will make a slight direction change and immediately begin looking toward the turn in the other direction, shifting balance and turning your feet just like you did before. As you become comfortable controlling your turns, you can use a smaller wedge, allowing the shape of your turn to control your speed.

Every christy turn is a blend of wedge turning, sideslipping, and traversing.

WEDGE CHRISTY TURNS

The next turn to master is the *wedge christy,* also called a basic christy. This is a turn that begins like a wedge turn, but finishes with the skis *matching,* or becoming parallel. Wedge christies almost come naturally, because as you shift your balance to the outside ski and guide both feet in the direction of the turn, the inside ski becomes so light that it simply matches the direction of the outside ski.

TRAVERSE AND SIDESLIP

Traversing and sideslipping are two important skills for getting around the mountain. A *traverse* is simply a straight run across the hill. Traversing can be difficult because, unlike the wedge in which you balance on the inside of both feet, in a traverse, you balance on the inside of the downhill ski and the outside of the uphill ski. A *sideslip* is similar to the traverse, except that instead of sliding across the hill, you face across the hill but slip sideways down the hill.

Your instructor might have suggestions to make turns easier, such as turning over the top of small rolls in the terrain or increasing your speed a bit to make the skis glide easier.

ADVANCED TURNS

Soon you will be ready for a *skidded parallel turn,* an easy transition from the wedge christy. You will learn how to use your ski poles and how to flex and extend your legs throughout your turns.

As you leave the beginning area behind and find yourself skiing intermediate runs, you will realize that becoming a better skier is fun. If you stick with it and practice, you will go on to *carved turns.* It takes time before a skier can carve most turns. You, your friends, and your instructor can explore more of the mountain while you hone your skills.

You also can work on *moguls.* These are bumps in the snow caused by skiers turning in one spot. Control in the moguls—absorbing the bump with your legs and keeping your skis on the snow—takes practice.

LONG, MEDIUM, AND SHORT TURNS

The first turns you learned to make probably were in the medium size range, with a turn radius of about 10 meters. Medium turns are useful for most types of skiing and work well to control speed on most beginner and intermediate slopes.

Longer turns are for speed. If you are comfortable on a slope, open up the turn shape to increase your speed. Short turns are the most difficult because all the elements of medium and long turns must be done quickly. Learning the timing of short turns takes practice, but it is necessary to ski steep terrain and bumps.

HOCKEY STOPS

Once you have learned the short turn, try the hockey stop, or emergency stop. You have probably seen ice skaters quickly pivot their skates sideways, spraying ice and coming to an immediate stop. To do this on skis, simply do a very short, quick turn. Start a hockey stop by traversing across a hill, gradually pointing downhill until you begin to gain speed. Then quickly point both feet uphill and tip your feet, knees, and legs into the hill to set the edges.

Cross-Country Skiing

Cross-country (XC), also called Nordic skiing, is a versatile and rewarding snow sport that can be enjoyed by novices and experts skiers alike. It offers opportunities to ski flat, groomed trails or to ski without trails in backcountry hills. Cross-country skiing is divided into three major styles:

- Classic, or diagonal-stride, skiing
- Skating, or freestyle skiing
- Telemark, or downhill Nordic, skiing

Cross-country skiing is one of the most aerobically demanding sports you can participate in. It requires using both arms and legs to move along the trail. It is a demanding but exhilarating full-body workout.

Cross-country skiing can be done on a variety of terrain. XC skiers may choose to ski on groomed and tracked trails at ski resorts, in parks or fields without trails, or in the challenging backcountry. Skiing without groomed trails is called ski touring and requires more skill than skiing on groomed trails at a resort. In the backcountry, skiers often have to break trail, and the terrain is usually more challenging and hilly. Advanced backcountry skiers may use special backcountry or telemark ski equipment to ski more challenging terrain without trails.

Ski mountaineering is the most demanding type of skiing. Ski mountaineers climb and ski in mountainous areas and need to be skilled mountaineers as well as experienced skiers. Ski mountaineering can be hazardous because of the rugged terrain and the possibility of avalanches.

Nordic Equipment

Each Nordic skiing style uses its own specialized equipment, but what all the styles have in common is that skiers use free-heel bindings and at least somewhat flexible boots.

Classic skis

Skating skis

Classic and Skating Skis

Nordic skis come in two basic categories: skating and classic. Neither type has metal edges and both types are very thin and light. Skate skis have a lower profile tip than classic skis and are typically 15 to 20 centimeters shorter than classic skis.

Classic Cross-Country Equipment

Traditional diagonal-stride skiing on groomed trails, in which the skis remain parallel to each other, is called *classic* skiing to distinguish it from skate skiing, a style that employs a technique similar to ice skating. (See the discussion of skating later in this chapter.) Classic gear is lightweight, easy to use, and suited to skiers of almost any ability.

CLASSIC SKIS

Classic skis are narrow, usually less than 50 millimeters wide, and usually taller than the skier. Modern ski length is based on width of ski, weight of skier, and type of skiing. Touring and backcountry skis are sturdier, wider, shorter and may have metal edges. Waxless patterns on the base allow the ski to slide forward or climb moderate hills without slipping backward. Some classic skis have high-performance, waxable bases.

CLASSIC BOOTS AND BINDINGS

Classic boots usually are lightweight, flexible, and comfortable. Classic bindings are as narrow as, or narrower than, the width of the ski so that the edge of the binding will not catch on the side of the groomed ski track. Most classic boots use system bindings of the NNN or Salomon type, which have replaced the traditional three-pin binding.

Classic ski boots, which attach to the binding only at the toe.

CLASSIC POLES

Classic poles often are made of lightweight fiberglass or aluminum. The pole baskets are behind the tip so that they do not catch in the snow. The poles should reach to the top of a skier's armpit.

Keeping Your Gear in Good Repair

If something goes wrong with your skis miles from civilization, you could be in for a long, wearisome trudge home. Avoid this situation by carrying an emergency repair kit containing a pair of pliers, a small roll of duct tape, a screwdriver that will fit the screws on your bindings, cord or wire, and any other repair items your instructor might suggest.

Taking good care of your skis while you are out on the trails and when you store them can also decrease the chances that they will need repairs. While skiing, pay attention to the surfaces over which you ski. Beware of rocks and sticks poking through the snow; they can gouge the bases of your skis and cause them to become sluggish. Avoid ditches, drops, and other depressions that could excessively bend your skis. When you get home, let your gear dry at room temperature. Recondition ski boots as you would any outdoor footwear.

Skating Cross-Country Equipment

Similar to classic cross-country gear, skating equipment is lightweight but has been redesigned for the special needs of skating, a style of skiing that is faster and demands more energy than classic Nordic skiing.

SKATING SKIS

Skating skis look like classic skis but with a lower profile tip and are usually 10 to 20 centimeters shorter and flexed for greater gliding speed. They always have a smooth, waxable base.

SKATING BOOTS AND BINDINGS

Skating boots are lightweight and comfortable. The main features of the skating boots are a high plastic cuff, which adds support and stability to the boot, and a stiff sole for greater push-off. Skating bindings are almost identical to classic bindings, but they sometimes have a slightly stiffer flex.

Skating boots are designed for speed.

SKATING POLES

Skating poles look like classic poles, only longer. Skating poles should reach to just above the skier's upper lip.

Unlike Alpine ski poles that are the same for both hands, skating poles are designed for the right and left hand.

Telemark Equipment

Telemark skiing is an advanced form of downhill cross-country skiing and makes use of a number of Alpine skiing techniques. In many ways, telemark equipment resembles Alpine equipment.

TELEMARK SKIS

Telemark skis have a shape similar to Alpine skis. But because XC skis have a free-heel binding system, the skier cannot generate as much forward pressure as an Alpine skier, so telemark skis typically have a softer, more even flex. Telemark skis are shorter than classic cross-country skis. They may be waxable or waxless.

TELEMARK BOOTS AND BINDINGS

Traditional telemark boots have soles much like hiking or climbing boots but have squared toes and three small holes to fit in the standard three-pin binding. Modern telemark boots look very much like Alpine boots with a full plastic shell and three or four buckles. Modern telemark bindings have a cable and heel piece that greatly improves performance. Although the telemark bindings do not hold the heel down as an Alpine binding does, they are lifted off the ski like an XC binding, which helps reduce the possibility that the binding will come in contact with the packed snow surface and hinder performance.

The cable and heel piece of the telemark bindings help improve the skier's performance.

TELEMARK POLES

Telemark poles are very similar to Alpine poles. Many telemark skiers use poles that can adjust in height and can be converted into avalanche probe poles.

Let's Go Skinning

For added traction, cross-country and telemark skiers faced with a challenging climb can attach climbing skins to their skis. These narrow, lightweight strips of mohair or nylon provide maximum traction on kicks and give the skier a bit of forward glide. They can easily be removed, rolled up, and tucked away before a descent.

Waxless and Waxable Cross-Country Skis

Cross-country skis come in waxless and waxable versions. Skiers choose waxless or waxable versions depending on their skill, experience, and personal preference. The base of a waxless ski has a molded texture on the middle third of it that resembles overlapping fish scales, diamonds, or some other pattern. The pattern provides traction on the snow during the kick or push-off but lifts slightly during the glide to allow the skier to move smoothly forward. Waxless skis are suitable for variable temperatures and snow conditions and are an excellent choice for beginners or anyone who does not want to deal with waxes.

Some skiers find waxless skis to be noisy on downhill runs and a bit slow, so they choose waxable skis. The base of a waxable ski has no molded pattern. Instead a skier applies a thin layer of special wax to the middle third of the base. As the skier's weight presses the ski down, microscopic crystals of snow dig into the wax and hold the ski steady. As the skier's weight shifts to the other ski, the waxed portion of the base rises a little above the snow, allowing the front and back of the ski to glide.

Waxable skis can be swifter and quieter than waxless models, but using wax effectively takes experience and practice. Different snow conditions require different waxes for maximum efficiency, and you will need to know the approximate temperature of the snow in order to choose the right wax. Waxes can be rubbed directly onto the base and then smoothed with a block of cork.

Nordic Skiing Skills

Every move in Nordic skiing starts with the basic stance. Your weight is centered over your entire foot. Your ankles and knees are bent slightly, shoulders rounded, arms relaxed, and head up.

Skiing in Flat Areas

DIAGONAL STRIDE

The diagonal stride is the classic cross-country movement. Arm and leg movements complement each other. As one leg moves forward, the opposite arm moves forward, much like walking or running. To ski efficiently, move forward with each stride so that you are gliding on one foot and kicking or pushing off on the other foot. Use your poles for added power. Good skiing is relaxed and rhythmic. Use the diagonal stride for slower speeds on flat trails and slight uphill slopes.

Diagonal stride

DOUBLE-POLING

Double-poling is a good change of pace from diagonal striding. It often is used on a slightly downhill slope or on fast tracks. Most of the double-poling power is supplied by your stomach muscles, rather than the arms, so be sure to lean forward on the poles and bend at the waist—as if you were doing a stomach crunch—when double-poling. The kick is timed when both arms are going forward so that you are balanced and gliding on one foot.

Double-poling

Ski Skating

Ski skating is an advanced technique in which the skier employs a skating motion that results in greater forward momentum. There are a number of different ways to skate. The different skate styles are like gears on a bicycle. Some gears are best at slow speeds or up hills. Others are better suited to higher speeds. The difference is subtle and depends mainly on the timing of the poling and skate push-off. The different "gears" can take years to master.

V1 skating

The most basic method is called V1 skating. The V1 is used on flat to slightly uphill terrain (first gear). Skiers move from ski to ski in a skating motion. Notice the asymmetric placement of the hands at the top of the forward swing in the V1. Here the skier steps forward with the pole plant. The pole push-off is only on one side of the skate. It is good form to transition smoothly between right- and left-sided V1 skates.

V2 skating

The V2 skate is better suited to flats and slight downhill sections at higher speeds (second gear). Here the skier steps forward from the pole/skate push-off. Poling occurs with each skate push-off in the V2. The V2 alternate has the same timing as the V2, but poling is on one side only (third gear). To make skating easier, focus on simply moving from one ski to the other. Try to avoid pushing off too hard. If your body is up and forward over a gliding ski, you will go fast with little effort.

Going Uphill and Downhill

TRAVERSE

A *traverse* is skiing uphill or downhill at an angle to the slope. For an uphill traverse, ski with an uphill diagonal stride across the slope. This creates a Z pattern in the snow. As the slope increases, you will have to edge the skis into the snow more to prevent sliding and to decrease the angle up the hill.

Traversing

Sidestepping

SIDESTEPPING

The sidestep can be used to climb or descend most hills. It's a slow way to climb, but it is easy to learn. Sidestepping is like going upstairs sideways, keeping your skis parallel and perpendicular to the fall line (the path a ball would take if rolling down the hill). Use your poles for stability.

HERRINGBONE

The *herringbone* is another way to climb hills if they are not too steep. It will take much practice. Work on it until you can move uphill without putting the tail (end) of one ski across the other as you climb. Use your poles behind the skis to keep from slipping downhill.

Herringbone

The arms and legs move opposite of each other as they do in the diagonal stride. However, the skis are angled out to form a V shape. There is very little glide, and in general, the steeper the hill, the wider the V.

STRAIGHT DOWNHILL RUNNING

To ski straight downhill, first clear the ski bottoms of snow by shuffling. Stand with your knees slightly bent and your skis parallel. Either step forward or push off with your poles to start, then lift the poles and hold them to the side. Keep your weight slightly forward and use the knees and ankles as shock absorbers for bumps. Keeping one foot slightly ahead of the other is a good way to increase your stability.

Straight downhill running

Controlling Your Speed and Stopping

POLE DRAG

Dragging the poles helps control speed on steep hills or on fast snow and ice. For dragging to the side, take your hands out of the pole straps. Hold the poles together and put downward pressure on the shafts and pull up on the handgrips. The baskets dragging in the snow will slow you.

Pole dragging

Snowplow

SNOWPLOW

The *snowplow* is a way to control speed and to stop on flatter slopes. Put your skis in the shape of a wedge (like a V) with the tips close together and the tails apart. Remember the basic stance—pressure over the whole foot, ankles and knees bent, shoulders rounded, arms relaxed, and head up.

To slow or stop yourself with a wedge, focus on using your ankles and feet, rolling the foot onto the big toe (rather than using your knees) to control the amount of edging you want. As the hill gets steeper, use a wider wedge by steering the tails farther apart while keeping the tips close together.

Turns

SNOWPLOW TURN

Influence the direction and speed of your descents with snowplow turns. Position the skis in the shape of a V—the snowplow—and lean on the skis' inside edges. More pressure on the right ski will cause you to turn left; pressure on left will take you to the right.

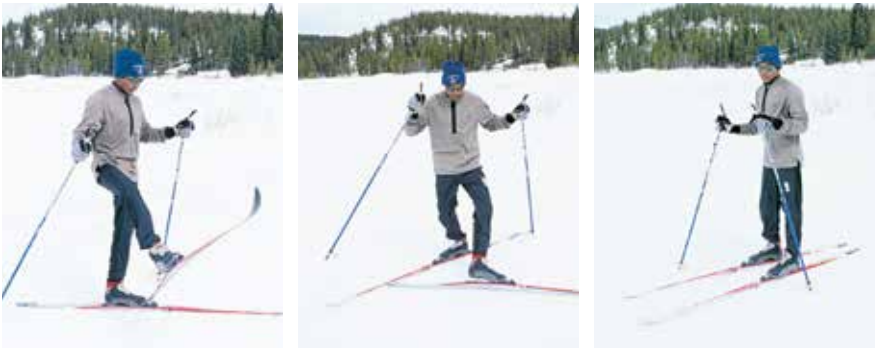
STEP TURN

The *step turn* is an easy way to turn while moving. Try it first on flat ground or on a gentle slope. Go slowly at first. Simply lift the tip of the ski on the side you are turning and point it in the new direction. Then set your weight on that ski and step the other one up to it.

Step turn

KICK TURN

The kick turn is used to change direction while standing still. Lift one ski above the snow, raise its tip, and carefully rotate your leg until you can put the tip down beside the tail of your other ski. Shift your weight off that ski, then lift it and twist around to place it in the normal position alongside the first ski.



Kick turn

TELEMARK TURN

Because Nordic bindings do not hold the heel down, a *telemark* stance is used for better fore and aft stability when skiing downhill. The position is much like a lunge on skis. Stand with the feet hip width apart and one foot about a boot's length behind the other, keeping the hips centered between them. This is a lot like standing on bicycle pedals. The heel is up on the rear foot and down on the front foot. The torso is upright with rounded shoulders and both hands in front for better balance.

To turn, steer both legs and skis simultaneously in the direction you want to go. Lead with the ski opposite, or outside, the direction of the turn. Once the turn is completed, scissor your feet to change leads and rhythmically steer into the next turn.

Telemark turn

Snowboarding

Many snowboarders have backgrounds in sports such as skateboarding, skiing, surfing, and wakeboarding (a relatively new board sport that combines skills used in waterskiing, snowboarding, and surfing). Some skills acquired in those sports can be helpful when learning how to snowboard.

A certified snowboard instructor or knowledgeable salesperson should be able to help you find equipment that is right for you.

Snowboarding Equipment

To begin snowboarding, you will need boots, bindings, a helmet, a snowboard, and a leash to prevent the hazard of a runaway board. You can rent equipment by the day or week, lease it for an entire season, buy used equipment at a local shop or snowboard swap, or buy new equipment.

Buying used equipment that is more than a couple of years old may not be a good idea, since snowboarding technology changes rapidly. However, because rental fees can quickly add up, you may want to buy your own gear if you plan to snowboard at least 15 days a year. If possible, first rent the equipment you want to buy to find out if it suits your needs.

A first-time snowboarder should take lessons from a certified instructor.

Major U.S. Snowboarding Organizations

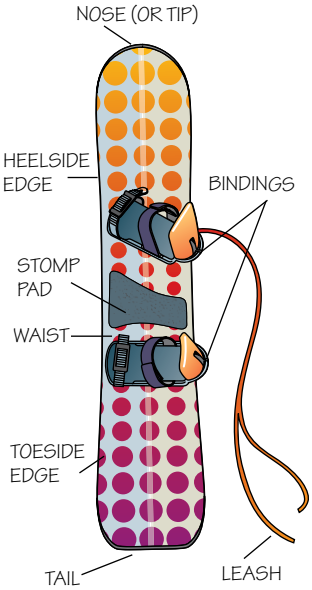
The American Association of Snowboard Instructors is an organization of ski and snowboard instructors whose purpose is to educate and certify instructors. The United States of America Snowboard and Freeski Association, founded in 1988, is a not-for-profit corporation that supports the responsible growth and development of amateur snowboarding through competition, while maintaining the fun and unique character of the sport. The USASA conducts hundreds of events nationwide through more than two dozen regional programs.

U.S. Ski & Snowboard is the national governing body for Olympic skiing and snowboarding. Its mission is to field and maintain a winning team of world-class ski and snowboard athletes. The association provides a pathway for aspiring young athletes to develop their skills through competitions and programs that provide them with opportunities to achieve athletic success.

Snowboards

A snowboard has the following parts:

- **Nose (or tip)**—the front part of the snowboard. It is rounded and upturned to push snow under the board and reduce friction.
- **Tail**—the rear part of the snowboard.
- **Waist**—the middle section of the board. Its width should be equal to the length of your foot.
- **Toeside edge**—the edge of the snowboard on the same side as your toes. It is used for making toeside (frontside) turns and traversing.
- **Heelside edge**—the edge of the board on the same side as your heels. It is used for making heelside (backside) turns and for traversing.
- **Bindings**—the fasteners that hold your boots to the board.
- **Leash**—a strap around the leg or attached to the boot to prevent a runaway board.
- **Stomp pad**—a pad that provides friction for your back foot when you are riding with the back foot loose.



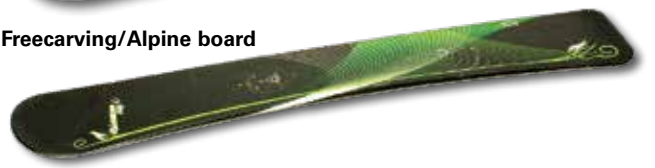
Parts of a snowboard

Using a leash makes sense for snowboarding at a resort area. However, it is not recommended in the backcountry, where there is avalanche danger and where you will need to be able to quickly release your snowboard.

Freestyle board

Freeride board

Freecarving/Alpine board



Choosing Your Board

The following information will help you determine which board is appropriate for your skill level and the style of riding you plan to do.

The most important factor in selecting a board is your weight. Boards are rated for weight ranges, and you should fit within the range of the board you choose. Boards generally should be at least chin height and no wider than the length of your foot where the bindings attach. The toe and heel of your boot should be flush with or slightly overhanging the edges of your snowboard to give you the most leverage and to allow for easy turning.

When selecting a board for width, make sure that your toes and heels come to the edge of the board. If a board is too wide for your foot, it will be challenging to edge or turn. Too much overhang of toes or heels can also negatively affect riding, so make sure you get a board that is the right width.

Snowboard lengths are measured in centimeters. The length of your board will depend on your height, weight, riding style, and ability.

Whether you rent or buy new or used equipment, it is essential that all equipment fit and function properly.

Types of Snowboards

- **Twin boards** have twin tips—the nose and tail are an identical, blunt shape suitable for riding forward or backward, jumping, and doing complicated spins and tricks. These are popular for riding terrain parks and pipes as well as for mountain freestyle-type riding.
- **Directional boards** have a directional shape with a stiffer tail and a longer tip for better flotation in chopped-up snow. The most common type of board, directional boards can be ridden both forward and fakie (switch) but are designed to turn differently ridden forward than they do fakie.
- **Specialty boards** are intended for very specific purposes such as park riding, pipe riding, rails, powder riding, and backcountry travel. They are not a good choice for a beginner.
- **Freecarving/Alpine boards** are stiff and narrow, used by racers or by riders who want to go really fast and lay down inch-deep tracks on hardpack or groomed snow. Alpine boards are not recommended for beginners.

Boots

Snowboarding boots come in three types: soft, step-in, and hard.

Soft boots are by far the most popular of the three and offer the most flexibility in the type of riding you can do. They are comfortable, compatible with the most common bindings, and allow flexibility for freestyle maneuvers. In general, soft boots have two parts. An inner bladder keeps your feet warm and dry and puts some padding between your feet and the bindings. The outer boot has deeply treaded soles that seat firmly in the base of highback bindings and a supportive, flexible upper that allows plenty of ankle movement.

Step-in boots must be used with the corresponding step-in binding. A step-in boot has an interface on its sole that connects with the bindings. Therefore, there is no need for straps on the bindings. Some riders prefer the freedom of being able to step into their binding instead of to attach straps.

Soft snowboard boot

Step-in snowboard boot

Whatever type of boots you choose, they should fit snugly around the heels and ankles to help prevent blisters. For a proper fit, make sure your boots hug the forefoot and that they fit your foot snugly from end to end. Avoid tying your boots so tightly that your feet go numb. This could cause your toes to freeze.

Hard boots (also called Alpine boots) have sturdy plastic shells, stiffer uppers than most soft boots, and stiffer soles to ensure that they will hold firmly to plate bindings without bending and popping free. Hard boots are generally used for racing or freecarving. Soft or step-in boots are probably the best choice for beginners.

Strap bindings

Bindings

Bindings fasten your boots to your snowboard and are designed not to release when you fall. Three major types of bindings are strap, step-in, and plate bindings. Make sure your bindings are compatible with your board and boots and with the style of riding you plan to do.

Strap bindings. Strap bindings clamp soft boots to the board with two straps and are by far the most popular bindings. The boots fit in a contoured baseplate and are held there by the straps, which buckle tightly with ratchets. A vertical plastic plate called a highback rises behind the ankles and lower calves. Taller, stiffer, and more cup-shaped highbacks give riders greater leverage on the board and can improve heelside edge control.

Step-in bindings

Step-in bindings. Step-in bindings eliminate the need for straps on the binding. There is an interface with the binding that connects with the boot to lock the boot onto the board. Step-in bindings may or may not have a highback. There are many different types of interfaces available, so make sure that your boots and bindings are compatible.

Plate bindings. Plate bindings lock hard boots securely to the board. They consist of a sturdy base plate and a heel or toe lever. When a boot is put into the binding, bails reach up and grab the boot's heel and toe protrusions. Flipping the heel or toe lever upward locks the bails in place.

Maintaining Your Bindings

For safe and enjoyable riding, keep your bindings in good repair.

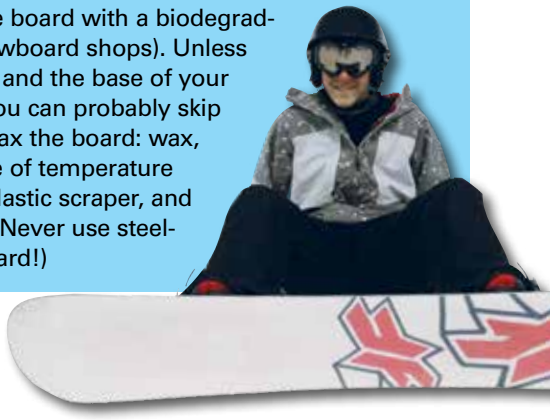
- Check bindings carefully for any damage before riding. Look for cracks in plastic, torn or broken straps, and missing pieces. If you find any problems, have the bindings repaired.
- Make sure all screws are tight, including those that hold straps as well as those in the baseplate that hold the bindings to the board.
- Ensure that the ratchets on strap bindings function smoothly and properly. Check that the mechanism on step-in bindings moves freely.
- Keep your bindings clean. Remove dirt, debris, or salt (from roads) to keep all the parts of the bindings working well.

Tuning Your Snowboard

Waxing is the easiest and most common way to tune a snowboard. Because wax makes it easier for snowboards to glide over snow, a waxed board will slide faster and turn more easily. Waxing also protects the snowboard's base from the effects of moisture, snow contaminants, and dirt.

Only wax specially made for waxing skis or snowboards should be used on your board. Use the correct wax for the temperature on the day you will be riding. Any snowboard shop should be able to supply the type of wax you need. If you are waxing well in advance of an outing, you should choose a good all-temperature wax.

If needed, clean the base of the board with a biodegradable wax remover (available at snowboard shops). Unless you have been riding in dirty snow and the base of your board is covered in dirty residue, you can probably skip this step. Gather the materials to wax the board: wax, an iron (wax irons are best because of temperature control, but any iron will work), a plastic scraper, and a waxing cork or nylon scrub pad. (Never use steel-wool pads when waxing a snowboard!)



Step 1—Clean the base of the board.

Step 2—Hold a bar of wax against the base of the waxing iron and let the wax drip onto the base of the board. Run a bead of wax back and forth along the base of the board without letting the iron touch the base.

Step 3—After dripping wax over the length of the base, smooth it out with the iron, spreading a thin layer of wax evenly over the entire base. Be careful not to let the iron stall, or you could ruin the base.

Step 4—While the wax is cooling, sharpen your plastic scraper with a 12-inch mill file: (1) Lay the file flat on a table. (2) Drag the thin edge of the scraper over the file. (3) Keeping the scraper at 90 degrees to the file, file until the scraper's edge is smooth and sharp.

Step 5—After waiting five minutes for the wax to cool, scrape off excess wax by pushing or pulling the scraper from tip to tail.

Step 6—Texture the wax with a nylon scrub pad, running the pad from tip to tail. Never run the pad from edge to edge.

Leashes

One hazard of snowboarding is a runaway snowboard—a snowboard that gets separated from its rider. A runaway snowboard can be a dangerous "torpedo," especially if there's no time to warn those below. A leash, a short cord that straps the front boot or leg to the front binding, helps prevent runaway snowboards. Although some resorts do not require leashes, it is highly recommended that you always use a leash.

Carrying a snowboard under one arm

Carrying a board by resting it against the small of the back

A board not in use should be positioned with the binding against the snow surface as shown, to keep it from sliding away or taking off by itself.

Preventing Snowboarding Injuries

Most snowboard injuries are caused by either twisting or impact. Many injuries involve the wrist, arms, or upper body. If you are about to crash, bend your knees and try to get low. This way, you will not have far to fall. Never put your hands out when falling; it risks injury to hands, wrists, elbows, and shoulders. If you fall forward, take the impact on your knees. Your knees are less vulnerable bent than when they are straight. If you fall backward, just sit down and take the impact on your rear. Stiff, supportive snowboarding boots help reduce the chance of injury, as do wrist guards and a helmet.

Carrying a Snowboard

There are many good ways to carry a board. You can carry it under one arm with the bindings facing your body on either side of your hip, or rest it against the small of your back with the bindings facing either in or out. You can hold it there with both arms draped over the base, gripping the edge of the board. This is comfortable for many people while hiking, but be aware of the tip and tail sticking out to either side so as not to bump into people.

A snowboard set in regular stance

A snowboard set in goofy stance

Bindings have degree markings on the baseplate or disks.

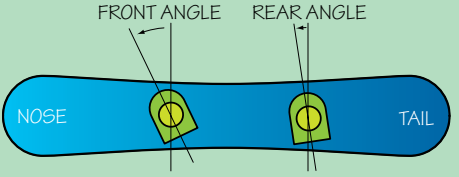
Snowboarding Skills

You are likely to fall often as you are learning to snowboard. Don't get discouraged. Once you have mastered the basic skills, you will improve quickly. With a few days of practice, you can be riding the whole mountain.

Stance and Angle

It doesn't matter which way you ride—choose the way you feel most comfortable. Riding with the right foot forward is known as "goofy"; riding with the left foot forward is known as "regular." To begin, you need to decide which foot will be your lead foot. You may already know which it is if you skateboard, wakeboard, or surf. If not, imagine sliding across a slippery floor or across some ice. You will naturally feel more comfortable with one foot or the other in front.

Adjusting Your Board



Once you get accustomed to the way the board moves and your personal style of riding it, you can adjust the bindings to allow your stance to be the most natural and comfortable for you. Your stance should always be centered and aligned with the width of the board, and about an inch wider than the width of your shoulders.

You can change the position and angles of snowboard bindings by simply unscrewing, adjusting, and then retightening them. Many rental board setups have an easy clip system that allows you to adjust the bindings with the push of a button.

Strapping boots into highback bindings while seated

Strapping boots into highback bindings while standing

You can place bindings on a board in countless ways, which gives you an amazing amount of freedom. Binding placement affects the way a board performs, so it is a good idea to start with a stance suggested by your instructor and then adjust as you become more proficient. When placing your binding on the board, angle your front binding forward about 12 degrees in relation to the center of the board. Angle your back binding rearward approximately 6 degrees.

Strapping In

To strap in, sit on a flat area in the snow, away from the flow of traffic. If required, attach a leash to your front leg or front foot. For highback bindings, step into the front binding and fasten the ankle and toe straps across the top of your foot. Tighten the straps firmly, but do not fasten them so tightly that you interfere with your circulation. (If you're using step-in bindings, you won't have straps to fasten.)

Plate bindings have either a toe or a heel lever. If they have a toe lever, insert the heel of your front foot under the front binding's heel bail and step down with your toe while flipping the toe lever to the locked position. If your bindings have a heel lever, step in toe first and lock your heel down last.

Locking down plate bindings

Skating

Skating and Sidestepping

Do not fasten your back foot. You can "skate" around the snow, propelled by your back foot, until you are comfortable. Place most of your weight over your front foot and push with your back foot. Once you push off with your free foot and your board starts to slide, you can put your back foot between the bindings and/or on the stomp pad and briefly glide with both feet on the board.

To travel up short hills, you may also sidestep. First, turn your board across the fall line, facing up the hill. Next, step up the hill with your free foot and then step the board forward, being sure to use the toeside edge to grip the snow. Small steps usually work best. Continue this one-two method of stepping until you reach the top.

Once you know how to skate, find a flat area and stand on the board with your free (rear) foot between your bindings (close to the rear binding). With your knees bent, your weight evenly balanced on both feet, and your shoulders facing toward your toes, flex and extend your legs to get comfortable in this position. This is called your neutral stance. To test the limits of your balance, rock onto your toeside edge and then your heel-side edge. You can catch yourself with your rear foot if you start to fall. Once you are comfortable with this stance, you are ready to try gliding down a small hill.

Sidestepping

Neutral stance

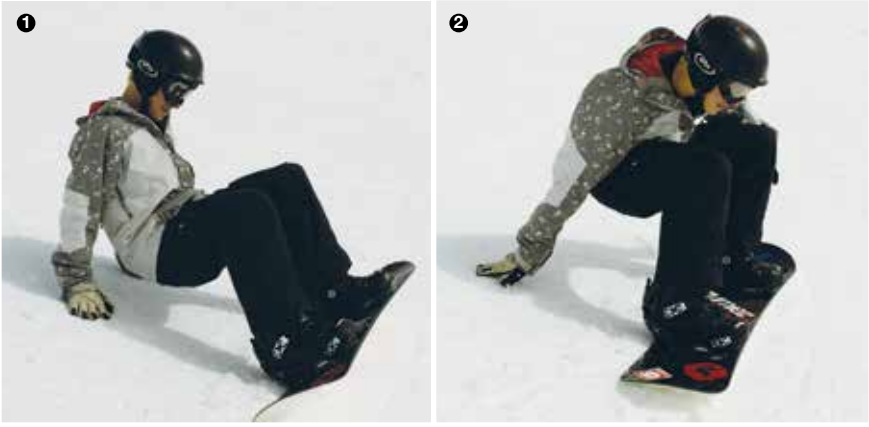
Riding Your First Hill

Find a short hill with a flat spot at the bottom. Skate or sidestep to the top of the hill, turn your board to point down the hill and place your rear foot back between the bindings next to the rear binding. While in neutral stance, allow the board to travel straight down the hill. Practice keeping your weight balanced on both feet and your shoulders facing your toes (your body should not twist but should remain in alignment). Try this until you feel comfortable riding the board down the hill with your foot out. Once you are comfortable going straight, you can try a slight turn, still with your rear foot unattached.

As you start down the practice hill, try flexing your knees and ankles to let some of your weight go onto your toes. As your weight shifts onto your toes, the board will begin to turn toward your toes. Maintain this position until the board turns and comes to a stop.

Standing

Once you are comfortable riding with the rear foot out, you can get some practice on the beginner hill. Sit down out of the way of traffic and strap in your rear foot so that both feet are in your bindings. You can stand up from either a kneeling or a sitting position. Place your board across the fall line. If you do not have your board across the fall line as you stand up, your board will start to move down the hill before you are ready.



Standing from seated position

If you are sitting down and facing downhill, you can stand up on your heelside edge. Start by pulling your feet up close to your body and dig the heelside edge into the snow. When you are ready to stand, push up with both hands until you are balanced in a squatting position. Some people find it easier to reach forward and grasp the toe edge as they push off the snow. Watch other people getting up to give you an idea of how to do it. Once you are in a squatting position, you can go ahead and stand all the way up.

If you are kneeling, face uphill with the board behind you (make sure the board is across the fall line). Pull your heels up under your rear, and dig your toeside edge into the snow. At the same time, work your hands toward the outside of your knees. Before you stand up, look uphill and check for oncoming traffic. When the way is clear, push up with your arms until you are in a squatting position on the board, and then straighten your legs.

Standing from a kneeling position

Sideslipping

Once standing, you will find it difficult to balance while standing still—this is normal. To keep from falling, you need to sideslip. This maneuver lets you slip sideways down the slope, either toeside or heelside.

Practice sideslipping on your heelside edge first because it is easier to see what you are doing and the highback binding supports the leg somewhat. Stand up, staying equally balanced on both heels. You can either gently pull your toes toward you or push them away from you to adjust the heelside edge as needed. Keep a relaxed, upright stance, and balance your weight evenly on your heels. Look where you are going—not down at your feet.

If you are having trouble standing up on a gentle slope, move to a slightly steeper hill. It is actually easier to dig your heelside edge into steeper grades than on the flats. When you are ready, gradually drop your toes slightly and start sideslipping. Be sure to make smooth, subtle movements, because it is easy to lose your balance. To go faster, allow your toes to drop a little more. To slow down or stop, lift up on your toes. Be smooth, stay comfortably flexed, stand on both feet evenly, and resist the urge to dig in your heels too hard, or you will stop and lose your balance.

Sideslipping improves your balance and reinforces your edge control.

Heelside sideslip

Toeside sideslip

When sideslipping, use your hands and arms for balance by holding them uphill in front of you.

Sideslipping is a little like riding a bike. If you go too slow or stop, balance is difficult. You need to keep moving to maintain balance. When you feel comfortable sideslipping on your heelside edge, switch to your toeside edge. Repeat the steps outlined previously, adjusting for your toeside edge. If you start to slip too much, lift your heels more to dig the uphill edge into the snow. Let your knees and ankles do the edging as opposed to just leaning uphill.

When on toeside, it is very important to watch where you are going. Your board will naturally tend to go where you look, so be careful. If you look at a tree, you will go toward—or run into—the tree. Instead, look at where you want to go, not where you do not want to go. Look across or up the hill instead of looking down the slope, which will take your board straight downhill.

Traversing

When you have mastered the sideslip—both toeside and heelside—you are ready to traverse. This maneuver allows you to go across a hill. Traversing reinforces your edging skills, helps you gain more speed, and improves your ability to stop.

To traverse, stand with your weight balanced evenly on both feet, bend your knees slightly, and align your torso with your lower body (your shoulders should be facing your feet). On the heelside, push on the front-foot toes while sideslipping. This will cause the tip of the board to drop slightly downhill, and the board will traverse. On the toeside, push the front-foot heels while sideslipping, and the tip will drop slightly downhill and the board will traverse. The longer you hold this position, with one foot pushing down more than the other, the longer you will traverse.

Traversing can be done in either direction—tip first (forward) or tail first (fakie or switch).

Traversing can be done by crossing a hill on either the toeside or heelside edge.

Stopping

To stop, turn the board perpendicular to the direction you are going. Tilt the board hard on the uphill edge, and balance over both feet. When you become more comfortable as your skills improve, you will learn to stop faster. The important thing to remember is that all your movements should be smooth—if you do anything too abruptly, you are likely to lose your balance.

Stopping

Learning to Turn

Practicing a maneuver known as the *garland* teaches the skills necessary for turning. Think of the garland as a half-turn. This maneuver is usually learned in only one direction—with the tip leading (forward).

Practice first with the heelside garland. While traversing on your heelside edge, push down on the toes of your front foot. This will force the tip of the board down the hill, toward the fall line. To stop the garland, roll back onto both heels, and lift the toes. To do a toeside garland, start in a toeside traverse, look down the hill over your front shoulder and push slightly on the heel of your front foot. The tip of the board will start to point downhill. To finish this garland, lift both heels and look back up the slope.

The more you practice garlands, the more comfortable you will be pointing your board completely downhill and then coming back across the hill. Once you have mastered garlands, you are ready to learn some turns.

Turning

There are numerous types of turns in snowboarding, but most can be categorized two ways: skidded or carved.

Skidded turns. Skidded turns are the turns you will make most in snowboarding. They allow you to control your speed on different types of terrain and make turns of different sizes.

Step 1—Start a skidded turn by standing on the center of your board. Maintain an upright stance. From a heelside position, push down on the front-foot toes to make the board go into the fall line.

Step 2—Once the board is in the fall line (pointed straight down the hill), continue to push on the front-foot toes and start pushing on the back-foot toes to bring the board around to the toeside edge. From a toeside position, look down the fall line toward the tip, and push down on the front-foot heel.

Step 3—When the board is in the fall line, continue pushing on the front-foot heel and add the back-foot heel. This will bring the board around onto the heelside edge.

This is the simplest skidded turn. You should practice this technique until it becomes easy to go from a heel turn to a toe turn and back. Once you are linking turns, you can adjust the size and shape with how much you twist the board (that is, how much you push down your toes or heels).

This technique will work on many types of terrain and can be used with different snow conditions. Practice executing skidded turns in various locations, moving toward more challenging terrain. Remember to always use your feet to make the turns and keep the body and arms quiet and smooth. If you find yourself using your arms or your body to make the turns, go back to easier terrain and review your technique.

Carved turn

Carved turns. Carved turns are a specific type of turn—one in which the tip and tail of the board follow the same track in the snow. Carved turns are smooth arcs that depend on the shape of your board, snow conditions, speed, and other factors. You must be riding faster to perform this maneuver, and balance is crucial.

Start by placing your weight equally between both feet and tip toward the toe edge or heel edge while in a traverse. Once you can achieve the balance, as your board tips over on its edge, it will turn all by itself. Try this on both edges while in a traverse until you are comfortable balancing on the edge. Once you master this, try a carved J-turn. Start with your board pointed down the fall line and tip the board over onto an edge and balance. Allow the board to make the turn back across the hill to a stop. To check if you executed the turn correctly, look at your track. If you see a very thin line in the snow, you did it!

After practicing the carved J-turn on both edges, you can try a full turn. Start by going across the hill fast. You will need the speed to help you balance. Begin the turn normally (like a skidded turn), but as soon as you start turning, try to lean into the turn and tip the board on edge. You should be able to get the same feeling you had in the skidded turn. Once you get the board on edge it should turn itself back across the hill.

Keep practicing and before too long you will go from one carved turn to another, leaving thin lines in the snow. Once mastered, it's a very useful maneuver to use all over the hill, especially in the pipe and park.

Riding Fakie (or Switch)

Riding fakie, or switch, just means riding along tailfirst. Many of the spins executed during snowboarding will leave you riding fakie. The same techniques used to ride forward are used to ride fakie, so it is a good idea to first review traversing, garlands, and turning. Then, try traversing fakie on a gentle slope. Next, try a fakie garland, focusing on using the proper technique. Once these feel comfortable, try some fakie turns, again focusing on using correct technique.

Tricks

When you are comfortable with the basic snowboarding skills, there are several types of tricks you can try, including ollies, grabs, and jumps.

OLLIES

An ollie is a basic but important way of getting airborne. If you are a skateboarder, you are probably already familiar with ollies. To ollie, start cruising along in a straight line on a gentle slope. Before you ollie, compress into a slight crouch. Jump up, bringing your front foot up first and driving it forward through the air. Lifting your front foot first loads up energy in the tail and provides some spring for your jump. Level out the board in the air by bringing both knees to your chest. Finish your ollie by landing with both feet on the ground at the same time.

Grab

Never grab in the "no-grab zones." You can grab anywhere between the feet, just outside the feet, or at the tip and tail.

GRABS

To do a grab, first get airborne. While in the air, flex your knees and ankles to pull your board up toward you. This will increase the amount of air you have and will make it easier to grab the board. Once you pull your board up to you, reach down and grab your board between your feet or by the tip or tail.

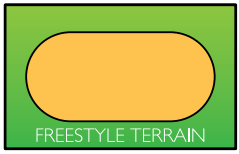
If it is difficult to grab the board, start by just touching the board or even your toes as you go off a jump. Remember to focus on the landing as well as the grab. Once you can reach down and touch your toes or board, you will get some solid grabs that will lead to the ability to tweak or poke the grabs. To tweak, you push or pull the board in some direction with the grab hand. To poke, you extend one or both legs while grabbing.

JUMPS

Doing a 180 involves jumping in one direction but landing in the opposite direction. You may ride from forward to fakie or from fakie to forward. As you approach the jump, prepare for a half-turn spin. During the jump, either spin frontside (with your chest facing the direction of travel) or backside (with your back facing the direction of travel).

You can practice the movement of the turn with your board on the snow. As you ride across the hill, go over a small bump. As you ride across the bump, execute the spin, remembering to ride away with the other foot leading (forward to fakie or fakie to forward). It is easier to start with frontside spins, because you can focus your eyes on where you are throughout the maneuver.

The 180 maneuver



Many resorts have a special trail symbol to mark freestyle terrain—the orange pill.

Features

Terrain parks contain many different features, including tabletop jumps, hip jumps, boxes, rails, and half-pipes, that can be fun and exciting to sample. It is very important that you familiarize yourself with the different features and how to maneuver on them safely before you try out a new trail. One way to do this is to observe other riders hitting the feature and to note how they do it. Noticing where riders start, how fast they go, and where they land will help you hit the features safely.

Rails

Boxes

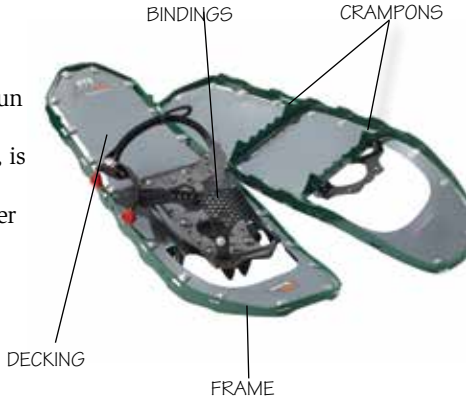
Tabletop jump

Half-pipe

Signs often mark controlled entry gates to terrain parks.

Snowshoeing

Throughout history, snowshoeing has been an important means of transportation. Today, this fun and invigorating activity is popular with winter recreationists, too. Snowshoeing is easy to learn, is inexpensive, and provides a great workout and satisfying way to explore nature during the colder months. This age-old sport appeals to a broad population because it offers low-impact exercise that improves cardiovascular fitness and is appropriate for all ages and abilities.



Parts of a snowshoe

Parts of a Snowshoe

Snowshoes allow you to float across snow-covered terrain with ease. They keep you from sinking waist-deep into new snow by evenly distributing your weight over a large surface area. Snowshoes allow you to hike, climb, or run across snow-packed trails or deep drifts of freshly fallen powder without struggling.

Frames and Decking

Until the 1950s, snowshoe frames were commonly made of wood, while the decking, or surface area, was formed from rawhide woven into a tight netlike pattern. Today's snowshoes are smaller, more responsive, and longer-lasting. Modern snowshoe frames are made from durable, lightweight aluminum or composite metals. Solid sheets of tough synthetic materials form decks that provide optimal flotation despite a smaller surface area.

Vintage snowshoes

Snowshoeing is good for your health! It burns up to 600 calories per hour—even more on challenging terrain.

Crampons

In addition to flotation, snowshoes provide traction on snow and ice. Short metal teeth called crampons clutch slippery surfaces to aid in travel uphill and over hard, frozen snow. Some snowshoes have only toe crampons under the ball of the foot, while versions made for more aggressive outdoor pursuits also have heel crampons for handling steep, mountainous terrain. Some styles also have side rails, or cleats running the entire length of the frame on both sides, to assist in climbing and descending steep slopes.

Bindings

Bindings secure snowshoes to boots and keep a traveler's feet aligned for efficient walking. They range in complexity from a few simple straps that go over the foot and around the heel to styles that mimic snowboard bindings by combining plastic bands with ratcheting devices. Bindings are critical to ensuring comfort and making the snowshoe perform well in a variety of conditions.

Snowshoes with rotating binding

Bindings can attach to decking in two ways: fixed or rotating. **Fixed bindings** limit the foot's rotation, forcing the tail, or back, of the snowshoe up with each step. These bindings maintain a natural and comfortable stride, but they also kick up snow with each step. **Floating, or rotating, bindings** pivot a good deal where they attach to the deck. They shed snow with each step, helping to reduce fatigue and making it easier to travel and steer through dense, deep snow. Rotating bindings are also better suited for climbing because the front of the snowshoe moves out of the way on uphill grades, allowing the crampons to engage more strongly. The fact that the bindings pivot, however, makes backing up or clearing obstacles a bit more difficult.

Types of Snowshoes

A snowshoe's size, shape, and features vary based on how they will be used and the type of terrain they will cover. For instance, a more oval shape allows for increased flotation, while a more tapered end adds agility and speed. Some styles include additional features, heel lifts, and side rails.

Fitness snowshoes

Running/fitness snowshoes are lightweight and durable. They have minimal traction, a tapered tail, and a sleek design that provides greater maneuverability for running and racing. The reduced surface area doesn't allow these snowshoes to float on deep snow, so this style is best for sticking to trails and packed snow.

Recreational snowshoes are perfect for beginners and others who want to explore gentle terrain. Meant for short, rolling hikes with minimal elevation change, they usually have a rounded tail, simple bindings, and little traction.

Hiking snowshoes

Hiking snowshoes are more advanced, durable, and able to handle moderate to advanced terrain and deep powder with little effort. They often have beefier bindings, more aggressive traction systems, and a streamlined design that makes them suited for longer explorations on rolling and steeper terrain.

Backcountry/mountain snowshoes are for adventurers who plan on breaking trail or backpacking over rugged terrain. They have the strongest bindings and the largest surface area for maximum flotation, even when carrying heavy loads or traveling through new, deep snow. Mountain snowshoes usually have extra aggressive crampons and side rails for added grip on steep climbs and descents. Many styles also have heel lifts or climbing bars that support the foot and reduce fatigue on long climbs.

In general, the more you weigh and the drier the snow you will be traveling, the larger the snowshoe deck should be.

Choosing a Snowshoe

When choosing a snowshoe, it's important to pick a model that is comfortable, fits your budget, and best suits your needs. Here are a few factors to consider.

What will you use your snowshoes for? Figure out if you'll primarily be backpacking, hiking, or climbing on steep terrain or running or walking on packed trails. This will help you determine which style and features are needed. For instance, if you'll be sticking to packed trails, a recreational snowshoe will meet your needs, whereas if you'll be backpacking or mountaineering, you'll want a larger, more durable shoe with aggressive crampons and a heel lift.

What snow conditions will you most often encounter? Consider a larger oval or rounded shoe with floating binding if you will spend most of your time in deep and dry powder. For heavy or packed snow, a smaller shoe with tapered, sleek design will work well.

What type of bindings will work best for you? Pick a binding that is suited for the shoes you plan to use and the conditions you will encounter. Most bindings are built to handle a variety of footwear from boots to running shoes, but make sure the binding fits the shoes you will be using and holds them snugly in place without rubbing or constricting your movement. Consider also whether you will be able to operate the binding while wearing gloves or mittens.

Will you be carrying heavy loads? Your body and pack weight is important to consider when choosing the right size snowshoe to keep you afloat. When shopping for snowshoes, look for the recommended load weight.

Caring for Snowshoes

Quality snowshoes can sustain years of use if they are well cared for. Here are some pointers to help keep snowshoes performing well.

- **Inspect snowshoes after each adventure.** Check wooden frames for splinters or gashes. In modern styles, keep an eye out for rips in the decking. Examine bindings, laces, and ratchets, and replace them when they appear worn. Check all metal and plastic for cracks, and examine nuts and bolts to make sure they remain tight.
- **After each use,** rinse snowshoes to remove dirt, salt, and minerals. Use a clean cloth to remove any remaining debris, and dry the shoes completely before storing.
- **At the end of winter,** soak snowshoes in a bath of lukewarm water to remove embedded dirt, salt, oil, and minerals. Dry thoroughly and store in a cool, dry, well-ventilated place away from direct sunlight so they'll be ready to go when the snow flies again.

In the mountains, stones, boulders, branches, and other debris can cause tears in the decking, damage to the frame, and wear on the crampons. Avoid walking on dry ground, hard surfaces, or rocky ridges while wearing snowshoes. Instead, for safety and comfort, take the time to switch out snowshoes for hiking boots.

Keeping Your Snowshoes in Good Condition

If something goes wrong with your snowshoes miles from civilization, you could be in for a long, wearisome trudge home. Avoid this situation by carrying an emergency repair kit containing a pair of pliers, a small roll of duct tape, a screwdriver, cord or picture wire, and any other repair items your instructor might suggest.

Snowshoeing Skills

Learning to snowshoe is fairly simple: Firmly plant the leading foot, place your weight on it, pause for a moment, and then step forward with your other foot. At this point, the only real skill you need to focus on is perfecting a wider than normal stance so you can avoid stepping on the frames. As you gain experience, you will develop more advanced skills so you can venture onto more varied terrain.

Using Poles

Using poles can help distribute the work throughout your body, providing an upper-body workout and conserving energy in your legs. Using poles also improves balance, provides additional stability, and takes some strain off joints, especially the knees and back. Poles are also a huge help with getting up after a fall in deep snow.

When choosing poles, look for adjustable poles that can change to handle the terrain. For instance, make them shorter for added power and ease while ascending and longer to help reach in front of your body when descending. Be sure to choose poles with straps. Putting your hand up through the straps from below allows you to rest on the straps and ensures that you won't lose the poles even if you drop them while on a steep slope.

Climbing Uphill

Kick step

When ascending, place your foot firmly into the snow to engage the toe crampons under the ball of your foot. This will provide the added traction needed to tackle a steep slope. If the snow is crusty or packed, you will need to rely largely on the claws of your crampons to dig in. If you are traveling over new and/or powdery snow, you might need to actually kick a step (called a kick step) into the hillside with each movement forward. This will drive your cleats into the freshly fallen or soft snow.

Certain conditions might call for the herringbone step, or "duck walk," where you point your toes out and lean forward, keeping your heels in and your poles in front of you to ease your progress uphill. For long ascents, flip up the heel lift (if you have one) to reduce fatigue and strain on your legs.

Traversing a Slope

If you encounter extremely steep terrain or snow conditions that make climbing a slope impossible, you will want to traverse the slope. Traversing, also known as side-hilling, minimizes muscle strain and ultimately saves time and energy. It is a critical skill to have when exploring more challenging terrain.

To begin, kick your snowshoe into the hillside and stomp down, trying to keep your snowshoes horizontal to the slope as you do this. Dig the uphill edge of each snowshoe into the hillside to create a shelf. Move along slowly, being sure to always weight the uphill snowshoe and remaining mindful of maintaining your balance. Use poles for added support. Try to keep gaining elevation by creating switchbacks, or a series of turns by which you traverse the steep sections. To change direction, get solid footing and then pivot on the downhill foot. Take turns leading, and do your best to follow the steps of the person in front of you.

Traversing on challenging terrain is best done by those wearing snowshoes with more aggressive traction systems and/or side rails.

Traveling Downhill

On the way down, stay relaxed, and let gravity work for you. Plant your heel and follow with your toe (the "plunge step"). Keep your weight slightly back, keep knees bent, and maintain a smooth rhythm. If your snowshoes have heel crampons, lean back farther to engage them. If you have only toe crampons, keep your weight more forward to engage the spikes. Keep poles out in front to help add balance and control on descents.

Traveling downhill

Breaking Trail

If you venture out after a snowstorm or frequent areas that are rarely used in winter, you'll likely find yourself breaking trail. Breaking trail can be tough in new, deep powder or in wet, heavy snow. Appropriate equipment for venturing off the trail includes larger snowshoes designed to help you sink less and stay somewhat afloat. Step efficiently, utilize poles, and keep a slow and steady pace so you don't overheat. Take frequent breaks and alternate taking the lead with your hiking partners to spread out the effort and prevent exhaustion.

Choosing a Trail

Snowshoeing can be done almost anywhere that is covered in snow. Many people enjoy snowshoeing at ski resorts and Nordic ski areas, which offer varied terrain, marked trails, and groomed routes. On Nordic trails, practice proper trail etiquette by yielding the right-of-way to skiers. If you want to stay close to home or just practice some skills, golf courses, parks, city or county open spaces, and local sledding hills make great spots for short jaunts.

Before hitting the trail at a ski resort, check to make sure snowshoers are allowed and if there are any restrictions. Some resorts limit snowshoers traveling uphill to certain areas or times in order to avoid conflicts with downhill ski traffic.

Traveling in the Backcountry

For a different perspective, explore your favorite summer hiking trails, state parks, or national parks on snowshoes. Venturing into these areas can be peaceful and challenging, but it requires advanced skills and knowledge so that everyone returns safely and without incident. Here are a few of the specialized skills needed for backcountry winter travel.

- Each team member must be physically fit for the demands of backcountry travel; breaking trail and climbing steep slopes can be exhausting.
- All members of the group should be efficient and skilled navigators. Before you embark, chart a course using map, compass, and terrain association. Do not rely solely on GPS devices because they can be inaccurate or fail.
- Know how to assess avalanche danger. Each member of your party should have a beacon, probe, and shovel and know how to use them in an emergency.

Watch the weather, carry survival gear, travel with a partner, and make wise decisions—even if it means not reaching your goal. Better to turn around early and get everyone home safe than find yourself in a survival situation.


BSA

Snow Sports Resources

Scouting Literature

BSA Deck of First Aid cards*; Basic Illustrated Wilderness First Aid; Emergency First Aid* pocket guide; *Be Prepared First Aid Book;* and *Emergency Preparedness, First Aid, Orienteering, Personal Fitness, Search and Rescue, Signs, Signals, and Codes,* and *Wilderness Survival* merit badge pamphlets

With your parent's permission, visit the Boy Scouts of America's official retail website, www.scoutshop.org, for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

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Organizations and Websites

American Association of Snowboard Instructors
133 S. Van Gordon St., Suite 200
Lakewood, CO 80228
Telephone: 303-987-9390
www.thesnowpros.org

American Institute for Avalanche Research and Education
avtraining.org

Cross Country Ski Areas Association
Telephone: 802-236-3021
www.xcski.org

National Ski Patrol
133 S. Van Gordon St., Suite 100
Lakewood, CO 80228
Telephone: 303-988-1111
www.nsp.org

Professional Ski Instructors of America
133 S. Van Gordon St., Suite 200
Lakewood, CO 80228
Telephone: 303-987-9390
www.thesnowpros.org

United States of America Snowboard and Freeski Association
P.O. Box 15500
South Lake Tahoe, CA 96151
Toll-free telephone: 800-404-9213
www.usasa.org

United States Snowshoe Association
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ussnowshoe.com

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