

Maine Chapter Appalachian Mountain Club

2016 Winter Hiking Workshop

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AMC MAINE CHAPTER WINTER ACTIVITIES
Introduction to Winter Hiking Workshop- Dec 7, 2016

For all trips, workshops, and activities: www.amcmaine.org/calendar

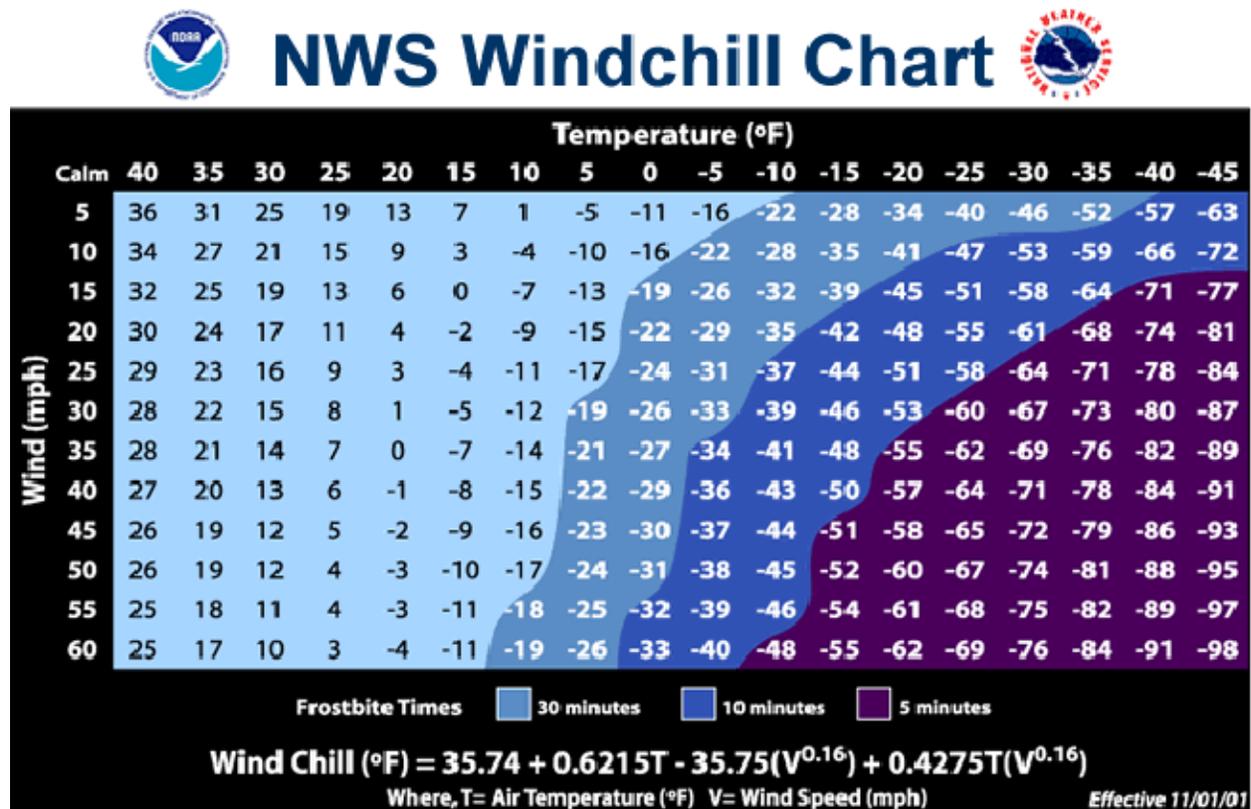
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The Winter Environment

Winter Weather

The winter environment is what separates outdoor winter activities from the other three seasons. You need to have the appropriate gear, be physically prepared, and have a positive attitude. The leader is responsible for some of these things, but a lot of it is up to you! Winter is not a season to be too “proud.”

Mountain weather is variable. It can be sunny, calm and 40F in the parking lot, but overcast (or precipitating), windy, and 0F at the summit. On average, the temperature drops 5 degrees F with every 1,000 feet in elevation gain. We have to be prepared for it all and make appropriate adjustments along the way. The weather can also change quickly and unpredictably in the same area. Check the local forecast before departing and keep an eye on the weather during your outing. Also be mindful of sunrise and sunset times- headlamps are a must-have item on a day-long winter outing. See links at the end of this document for weather forecast sites.



Hypothermia

Hypothermia is caused by a lowering of the core body temperature due to the body's inability to re-warm itself. Prevent this condition by staying dry, never depleting your energy reserves (eat and stay hydrated!), staying aware of wind-chill effect, and keeping an eye on each other.

Early symptoms include: undo stumbling, disengagement from the group, slow movement, shivering, and irritability. To treat, provide the person with dry, warm clothing, quick energy food, and warm liquids (never alcohol) in small sips.

Frostbite

Frostbite is freezing of flesh caused by exposure to cold. Susceptible areas are the nose, ears, face, fingertips and toes. Prevent by minimizing exposed flesh, staying dry, having adequate gear, staying aware of wind-chill effect, and keeping an eye on each other. Early symptoms include cold, red skin, and often painful skin. Later symptoms include whitened, waxen skin, and numbness. To treat, protect the affected area and re-warm by skin-to-skin contact. Never rub the area or heat quickly with hot water or chemical hand warmers; this can cause burns! In extreme circumstances it may be best to delay re-warming until you're back from your trip. Watch out for shock and hypothermia and never give alcohol as a "treatment".

Clothing for Winter Outings

As previously mentioned, mountain weather is variable, unpredictable, and ever-changing. As a result, we have to have in our packs an arsenal to prepare for all conditions to be dry, warm, and have fun!

Paradoxically, one of the biggest challenges in the coldest season is to avoid getting too hot! Physical activity generates body heat that induces perspiration. This wets us and our clothing, and then can quickly make us cold especially when we stop moving. Being dry is 28-times warmer than being wet due to water's specific heat capacity. That jacket you had on in the parking lot will make you roast when you start hiking up the trail. It's hard to do, but it's best to start hiking "cold"; you will warm up quickly

when you start moving. The balance to find is that you are warm enough so you are comfortable, but not too warm that you are sweating.

“Cotton kills.” Cotton retains moisture, and when it is damp or wet, it will **not** keep you warm. Cotton should be avoided during winter outings. Wool or synthetics are much better alternatives.

In 2012, there was post in AMC's "Equipped" blog on how to select winter gear:
<http://equipped.outdoors.org/2012/11/how-to-choose-best-winter-gear.html>

Layering Systems- Dress like an onion!

Whether top (torso and arms) or bottom (feet and legs), use a 3-layer system for dressing. On warmer days, the insulating layer may not be needed when you are on the move; just the wicking layer and outer layer will suffice. However, always have an insulating layer for both top and bottom, and usually at least two for the top, in your pack.

- A wicking layer- to keep moisture away from the skin. This could be polypro, silk, wool.
- An insulating layer- generally light or mid-weight- expedition weight is too warm when moving. This could be thicker poly or wool, or quality fleece. Down is generally too warm when active. This is where a lot of the “adjusting” goes on if you are hot or cold.
- An outer layer- to block wind and shed snow. This could be a hardshell or softshell (see detailed discussion below). Needs to shed snow and the elements.

Things to look for in upper body clothing

- Zip neck (turtle necks are usually too warm and not adjustable)
- Hood on your outer layer
- Full zip versus pull-over for outer layer- pull-overs are okay for inner layers that you won't be taking on and off during the day
- Handy and multiple pockets that are easy to access with gloves on
- Ventilation options- in pockets, cuffs, pit-zips
- Breathable fabric (softshell or hardshell). See below for a discussion of clothing material.

Things to look for in lower body clothing

- Full zip so you can get them on and off without removing your snowshoes/ crampons and boots
- Handy and multiple pockets that are easy to access with gloves on
- Extra protection (durable material) on the knees and buttocks
- Inner cuff to fit over your boot (keeps out snow)
- Ventilation options- side zips
- Durable material on the inner cuff/shin for an unintended encounter with a crampon
- Breathable fabric (softshell or hardshell)

Feet

Feet should subscribe to the same layering system as other clothing:

- Wicking liner (ex. poly)
- Wool or synthetic outer sock for insulation

Vapor barriers are sometimes used to prevent the wetness accumulated in the wicking layer from seeping into the outer, insulating layer. A plastic bread-bag will also do the trick for one-time use. Chemical toe warmers are available, but can actually make your toes colder if there is not enough room for them because it leads to tightness in the end of your boot that will then constrict blood-flow and decrease blood flow and therefore warmth to your toes!

Head

Much of your body's thermal regulation takes place through your head and neck. The mother's age-old saying "If you're cold, put a hat on" may have some merit. It's important to keep your noggin and ears warm when on the trail. Although typically not thought of, layering here also works well.

- A thin, breathable hat to wear when active, that might get wet from sweat or falling snow. Have a second one of these in your pack if you tend to sweat a lot.
- A hat with more insulation and/or wind-blocking to wear above tree-line or in colder temperatures
- A hood on your outer layer is often handy too.
- A balaclava/face mask protects your neck, face, forehead and nose when conditions are very cold and windy.
- Goggles to cover your forehead and eyes when conditions are very cold, windy, and/or precipitation is falling
- A zip neck on your insulating layer can keep your neck warm, or use a neck warmer.
- If a hat is too warm, try a headband or earmuffs to just keep your ears warm.

Hands

Warm hands are important to function as well as to maintain mental happiness. Gloves and mittens often get wet as they are used to adjust snowshoes, push through snow-covered branches, used when gravity overcomes us, or from sweat. So it is a good idea to have spares. In addition, different levels of aerobic activities and different weather conditions encountered necessitate the need for a variety of options. Just like other clothing, layering works best.

- Liner gloves (wool or poly) inside a shell or insulated glove/mitten. These provide quick dexterity when needed to adjust a snowshoe or unzip something. These often get wet, so have a couple of pairs.
- Mittens are generally warmer than gloves since fingers can share the heat.
- Should have a good "seal" to your outer upper body layer to prevent heat loss and snow infiltration. This can be in the form of a long cuff.

- Have a really warm pair of mittens stashed away or attached to your pack for when you (or someone else) need them.
- Store an extra pair inside your outer layer, so they are toasty warm when you need them.

Other layers

When conditions change drastically through the course of an activity, especially if you are going above tree-line, more than just 3 layers are often needed. Extra insulating layers as well as a hardshell layer that is waterproof and windproof are needed.

- Breathable insulating layers- thicker poly or wool, quality fleece
- Hardshell top and bottom to keep out wind and water
- Down parka “puff jacket”
- “Expedition” mittens

Overall

- Cotton kills- none is allowed.
- Dress like an onion (in layers); (1) wicking, (2) insulating, (3) water/wind resistant.
- Zippers and pockets are great.
- Hoods are versatile.
- Have extras- things get wet easily.
- It’s best if you don’t have to take anything off to put more clothes on; have a clothing system that works together.

--- An interlude on clothing materials ---

Clothing Material- Hardshells or Softshells? By Laura Flight

The trend in outdoor clothing and somewhat of a debate is “hardshell” or “softshell” since softshells came on the market in earnest 12 or so years ago. So, which to use? Below is a discussion about what type of fabric to wear on the trail, when to wear it, and general advantages and disadvantages of both. I am not a gear pro, but based on my experiences and a bit of research, here is what I can share with you.

The basic considerations of outdoor clothing involve conditions you will be wearing them in, breathability, versatility, packability, and of course how big of a hole it will leave in your wallet. What you wear is ultimately dictated by personal preference. If you are in the market for some new outdoor clothing or unhappy with your current system, here are some things to consider.

First, some definitions.

Hardshell. The fabric weave of a hardshell is tight in order to prevent the outdoor elements from seeping inside to you. This fabric is either laminated with a breathable membrane (a popular example being Gore-Tex), or sprayed with a waterproof

microporous coating to give it some breathability. The finish of a hardshell will feel stiff and dense, and be mostly waterproof and windproof.

Softshell. The fabric weave of a softshell has more stretch to allow for more breathability from the inside (you) to the outside. This is to allow the heat and moisture you generate from physical activity to escape and not accumulate on you, making you clammy and cold. The finish of a softshell will feel flexible and soft, and be water-resistant and somewhat windproof. Remember water-resistant and waterproof are not synonyms; water-resistant means a moderate amount of water will be repelled for a moderate amount of time. Waterproof means water will not transfer through the medium no matter the degree or duration of wetness.

Conditions

Hardshells are the rugged layers you generally don when it is raining, snowing, blowing a gale, or all of the above. These outer layers will keep precipitation and wind at bay, or at least from penetrating through to your inner layers.

Softshells have DWR (durable waterproof repellent) and although they will not keep you dry in a downpour, they work just fine in light snow or drizzle, as well as a stiff breeze. Softshells will soak through with time, and a harsh, cold wind will find its way through.

ADVANTAGE: Hardshells will ward off the harsh elements better than softshells.

Breathability

Hardshells are designed to breathe, but they are much better at keeping the elements out than releasing your moisture generated from within. Many hardshells come with physical features such as pit-zips, vented pockets, and adjustable arm cuffs to give you some control in managing breathability. But overall, unless it is raining cats and dogs or blowing a gale you might generate more condensation from within than can be let out.

Softshells overall are about three times as breathable as hardshells and are therefore great for winter outdoor activities requiring any level of exertion. If you are one of those that starts to sweat right out of the parking lot, the triple level of breathability may be your next best friend. Even if you are not, a simple base layer or two underneath provides the thermal foundation you need. Up on a windy summit on a cold day, you might want a bit more protection.

Warning: Not all hardshell or softshell materials are created equal! For a detailed review of popular fabrics, check out the following link:

<http://www.fabriclink.com/search/fabric-search.cfm>

ADVANTAGE: Softshells will breathe better than hardshells and are more effective at keeping moisture off your body.

Versatility

Hardshells are generally bomb-proof against wind, rain, and snow. Hardshells are also more likely to be used on terrain where weather is a greater factor, such as above treeline or in open areas. So if the forecast or route calls for these conditions, it's comforting to know you have a hardshell in your pack. These conditions are generally the exception rather than the rule.

Softshells can be worn during favorable conditions (when nothing is falling from the sky) as well as slightly unfavorable conditions (a light snow or drizzle). Overall, a softshell can be worn more often than not. Softshells by virtue of their nature also have some built-in insulation.

ADVANTAGE: Softshells can be used in a broader range of conditions than hardshells, although both are effective for layering.

Packability, Other Considerations

Hardshells weigh less and compress more than their softshell counterparts as far as toting and fitting them in your pack. Hardshells are stiffer when extending or reaching. Hardshells also make that incessant “wsh-wsh-wsh-wshing” noise when the fabric brushes against itself as you stride down the trail.

Softshells are bulkier and heavier than hardshells when it comes to pack weight and space. Softshells are more flexible to give you a full range of motion, and they don't generate a metronome output when moving down the trail.

ADVANTAGE: Tie. Hardshells are less of a burden in your pack, but softshells are flexible and quiet.

Price

Like anything, there is the low-end and the high-end, as well as all prices in between, and you get what you pay for. The softshell market is vibrant so competition among companies is healthy. Prices with hardshells are very comparable.

ADVANTAGE: Depends; hardshells are generally more expensive than softshells, but tend to last longer which can justify their investment.

So, hardshell or softshell? Softshells win the breathability and versatility contests hands down, but hardshells out-perform softshells when the going gets tough. Hardshells have a slight edge in the weight and packability competition, but not in the “nature at peace category” considering you can hear them coming from a mile away. And price is anybody's game. To me a simple tally provides inconclusive results. Considering that the majority of conditions are more appropriate for softshells, they may be a better bang for your buck. But don't bury your hardshell in some pile of not-often-used gear; you might want it when the sky opens up or the wind is gusting- that

hardshell can be great protection over that nice softshell you have been hiking in all day.

Footwear

Summer hiking boots are not warm enough for winter use. Let me repeat that: Summer hiking boots are not warm enough for winter use! Winter boots need to be insulated and water resistant as well as comfortable. If you purchase a winter boot, always try them on with the socks you will be wearing when using them on the trail, as well as any orthotics you may use.

Issues to consider when purchasing winter footwear:

- Protection from wet
- Protection from cold
- Ankle support
- Sturdy and non-deforming- so snowshoe or crampon bindings don't squeeze your foot
- Stiff sole- to not waste energy and ensure crampons stay affixed
- Protection from crampons and ice axes
- Fit and comfort. Try on with winter socks, orthotics etc. you will be using.

Here's an AMC "Equipped" blog post on features to consider for snowshoeing boots: <http://equipped.outdoors.org/2013/12/the-best-boots-for-snowshoeing-five-key.html>

There are four basic grades of winter hiking boots.

(1) Pac boots- Most of us started wearing pac boots during outdoor recess in elementary school- boot that had a rubber bottom, a leather/rubber top, and an insulating liner. The classic "LL Bean hunting boot." These are warm and reasonably priced. They are adequate for non-technical hiking, but they do not accept crampons. The strap-type crampons may fit them, but they are not as secure as crampons on rigid boots. Common brands include: LL Bean, Sorel, and Kamik. Price range- up to \$100.

Pac boots- Advantages

- Light, warm
- Best suited for flat or rolling terrain or bare-booting on hard surfaces
- Sufficient for use with snowshoes
- Very nice for camping, après ski, "standing" functions like sports events, workshops
- Easy to get on and off
- Cost

Pac boots- Disadvantages

- Soft sides can result in snowshoe or crampon straps constricting blood flow = cold feet
- Little if any arch support and minimal ankle support
- Minimal protection from sharp objects (poles, crampons)
- Not compatible with most crampons

- Difficult to wear with gaiters
- Don't breath, and liners are slow to dry
- Traction may be less aggressive

Bottom line on pac boots

- Decent all-around boot recommended as a starter boot if you are not sure if you will enjoy winter hiking
- Not recommended on steep terrain
- Cost up to \$100

(2) Winter hiking boots- There are now many varieties of middle-of-the-road boots that are very adequate for winter hiking, both for snowshoes and strap-on crampons in non-extreme terrain. These boots are insulated, have good soles, and are more rigid than pac boots. These have adequate insulation (check the number of grams), provide support, and have rigid soles for snowshoe and crampon attachments.

Common brands include: LL Bean, Kamik, Morrill, Salomon, Garmont, and Northface. Price range- up to \$200.

Winter hiking boots- Advantages

- Light, warm
- Good, stiff sole
- Good arch and ankle support
- Water resistant
- Compatible with snowshoes and strap-style crampons
- Easy to get on and off
- Comfortable
- Cost

Winter hiking boots- Disadvantages

- Minimal protection from sharp objects (crampons)
- Not compatible with snap-on crampons
- Liners are slow to dry

Bottom line on winter hiking boots

- Very versatile and capable boot for not much investment

(3) Mountaineering boots- These are high performance boots that are rigid and stiff both in the soles and vertically. They will accept a snap-on crampon and are waterproof. They are also

generally well insulated and some have removable liners. The newest generation of Super Gaiter Boots are lighter weight than double boots but offer the warmth advantage of the doubles. Common brands include: Asolo, Kayland, Koflach, La Sportiva, Scarpa, and Salomon. Price range- up to \$500.

Mountaineering Boots- Advantages

- Provide substantial protection from crampon and ice ax mishaps
- Offer significant ankle support
- Provide a solid, rigid platform for crampons, and permits front pointing
- Excellent for edging and kicking steps
- Permits use of step-in crampons and putting them on quickly

Mountaineering Boots- Disadvantages

- Heavy
- Uncomfortable on hard surfaces such as ledge or firmly packed trail
- Hard to put on and remove (or drive with!)
- Expensive

Bottom Line on Mountaineering Boots

- Recommended for steep terrain or where extensive crampon use is expected
- A much safer boot and one you can grow into but not out of
- Cost \$200-400, typically \$300; or, just \$30.00 per toe!

(4) Double-plastic boots- This type of boot is heavier and more rigid than the others, but it is waterproof and offers a perfect grip for crampons of any type. Some are made for ice climbers and are very stiff; look for boots that flex a bit for hiking. These may be rented from EMS and REI; it's a good idea to try them before buying. Common brands include: Koflach, Asolo, and Scarpas. Price range- up to \$500.

Plastic Double Boots- Advantages

- Provide substantial protection from crampon and ice ax mishaps
- Offer significant ankle protection
- Provide a solid, rigid platform for crampons, and permit front pointing
- Excellent for edging and kicking steps
- Permit use of quickly putting on step-in crampons
- Most have removable liners enabling quicker drying

Plastic Double Boots- Disadvantages

- Heavier than pac boots
- Uncomfortable on hard surfaces such as ledge or firmly packed trail
- Hard to put on and remove (or drive with!)
- Expensive

Bottom Line on Plastic Boots

- Recommended for steep terrain or where extensive crampon use is expected
- A much safer boot and one you can grow into but not out of
- Cost \$200-500, typically \$300; or, just \$30.00 per toe!

Gaiters

Gaiters are often worn in the winter, but not your summer ones. These articles of clothing strap around the bottom of your boot and wrap tightly around your shin. If using gaiters in the winter, look for them to be 14-18 inches high to keep deep snow out of the boots. Many also have a more durable fabric on the inner leg side to protect against crampon punctures. Bring your winter boots when you buy gaiters; the gaiters must fit over whatever boot you have! Common brands include: OR, EMS, Log Cabin Designs. Cost \$30-90

Advantages

- Prevent snow from getting into your boots (and then melting and making your feet wet)
- Protect your pants (and legs!) from an incidental crampon encounter
- Extra insulation on your legs

Disadvantages

- Many hiking pants have an adequate cuff to keep snow out and a durable patch of material over the inside cuff for potential crampon encounters.
- Gaiters add another layer and can become hot to wear.
- Another piece of gear to have and put on, the latter of which is difficult in cold conditions

Traction Devices

There are a variety of traction devices available to us denizens of winter climes. However, some are only good for a walk out to the mailbox and should be left at home while on your winter outing. Although we don't think of them as such, snowshoes are really a traction device; you will know this if you have ever tried to wallow through deep snow in just your boots.

Snowshoes

There are many different sizes, styles, shapes, binding types, and levels of quality. Snowshoes are sold at your local hardware store, your "local" big-box store, as well as retail and on-line gear stores. It is highly recommended that you purchase snowshoes from a retailer that specializes in outdoor activities (so not your local hardware store or the big-box down the road).

Types of snowshoes

- Recreational- These are often made of the same materials as mountaineering snowshoes, but not quite the level of durability and attention to components. These snowshoes are intended for walks in the backyard or over rolling terrain. They likely have cleats under the ball of your foot, but they will be much less aggressive than mountaineering snowshoes. Price range up to \$150.
- Mountaineering snowshoes- These are built to endure stresses of mountain conditions such as steep terrain and interactions with rocks and other hard surfaces when not on full snow covered areas. The components are rugged and built to last. The cleats will be larger than those on a recreational snowshoe, and there will likely be more of them. In addition to the ones below the ball of the foot, there will likely be teeth the length of the shoe near the edges to provide traction when on uneven (side-hill) terrain. Brands include Atlas, MSR, Tubbs, and Garneau. Price range \$150-300.
- Racing or trail running snowshoes- These are not intended for winter hiking unless you 100% know the trail is firmly packed out and you are only using them as a traction device. These will not provide any floatation if there is fresh snow. They are narrow, short, and therefore lightweight. Brands include Atlas, Cresecent Moon, Dion, and Red Feather. Price range \$200-400.
- Your grandparent's wooden ones- These are fine for backyard wanderings or trips to the outhouse, but should not be taken in mountain terrain, as traction is very poor. They likely provide excellent floatation in deep snow due to their sheer size, but you also have to be bow-legged to use them. The original bindings are often inadequate, but you can often purchase upgrades that will keep you attached to the shoe a bit better.

Things to consider for snowshoes:

- Your weight- the amount of floatation on the snow is related to your weight (including what you have on for clothes and what is in your pack!) and the footprint of your snowshoe.
- Snow conditions- if the snow is light and fluffy versus heavy and wet, this will impact the amount you sink into the snowpack. Also, if you are hiking on a trail that has been traveled on since the last snowstorm (is “broken-out”), this packed surface will be easy to walk and snowshoes may not be required. BUT, they may be further up the trail; you never know how far the last party went before they turned around, so never leave your snowshoes behind!
- Here’s a link to a sizing chart:
http://www.backpacker.com/november_2000_gear_snowshoe_sizing_chart/gear/1791
- Terrain- steep? flat? rocky? The more aggressive the terrain, the more durable the snowshoe you will want.
- Bindings- These should be easy to use with gloved hands and stay attached to your boot. There are a variety of systems from snaps and buckles, to step-in (on a lot of recreational models- not recommended for winter hiking), to hole-strap-plug systems, to ratcheting systems. It has to be durable and work, ideally with a gloved hand.
- Boots- Although most snowshoes will work with any boot, it is best to make sure they work well together, are easy to take on and off, and will stay on.
- Cleats- Look for cleats under the ball of your foot as well as along the sides for traction on uneven terrain.
- Heel-lifts- Many mountaineering snowshoes have a bar that optionally can be raised under your heel for steep ascents; the “high-heels” of snowshoe dancing. This significantly reduces the amount of work you have to do when climbing as your leg is already partially lifted for the next step.
- Tails- some brands have detachable tails- basically the back 6-10 inches can be on or off depending if you are in deep snow or not.

Here’s an AMC “Equipped” blog post on features to consider for snowshoes:

<http://www.outdoors.org/publications/outdoors/2012/equipped/winter-walkers-choose-right-snowshoes.cfm>

<http://www.outdoors.org/publications/outdoors/archives/equipped.cfm>

Backcountry snowshoes generally come in three sizes:

8 x 25 inches

9 x 30 inches

10 x 36 inches

The proper size for you depends on two things:

1) your weight (including pack) and 2) snow conditions. See table below.

Note: The sizes may vary by a few inches depending on the brand. Sometimes the shape of a snowshoe will affect the sizing as well, so be sure to consult the manufacturer’s own sizing recommendations.

You plus your pack weight **And most of the snow you encounter is:**

Snowshoe size

under 150 lbs.	deep, dry, powdery	8 x 25 in.
under 150 lbs.	dense, wet, and compacted	8 x 25 in.
150 to 175 lbs.	deep, dry, powdery	9 x 30 in.
150 to 175 lbs.	dense, wet, and compacted	8 x 25 in.
175 to 200 lbs.	deep, dry, powdery	10 x 36 in.
175 to 200 lbs.	dense, wet, and compacted	9 x 30 in.
Over 200 lbs.	deep, dry, powdery	10 x 36 in.
Over 200 lbs.	dense, wet, and compacted	10 x 36 in.

Mini-crampons

The last few years have seen a macro-burst of mini or less aggressive “crampons” come into the market. They are all the rage, and a worthy item to have. However, as with anything, quality is key. There are several models that are great for going to get the mail and shoveling the walk, but nothing more. These will not hold up when walking on hard, uneven terrain for several miles. The advantages of the quality micro-crampons are they are small, lightweight, and get the job done in many conditions. These are also a great option when you are on a trail that has been broken out (so you don’t need snowshoes), but it is a bit too slippery to just bare-boot (just walk in your boots), but crampons are over-kill. The most popular brand has been Kahtoola Microspikes and they have passed the durability test. Yaktrax XTR Extremes also have gotten good reviews. The 2014 going price seems to be about \$65.

Full Crampons

Full crampons are intended for travel over steep, uneven, and icy (not just slippery) terrain. The teeth on full crampons are bigger than on the mini-crampons and they are often referred to by the number of “points” (teeth); a common one is “12-point crampons”. There are two basic types of bindings for full crampons; (1) strap-on and (2) step-in (there is a two letter difference in the first word, and the preposition is different in the second). The strap-on type uses a strap through a series of loops and buckles to attach to your boot. The step-in crampons have a snap type binding system with a metal frame that clasp onto your boot. The performance of these two types (for winter hiking and mountaineering, not ice climbing) is virtually the same. The biggest factor is the type of boot you will be using them with. Neither style crampon is appropriate for pac boots.

The strap-on crampons work with most winter hiking boots (as long as the soles are stiff), all mountaineering boots, and most double-plastic boots. These crampons are versatile and somewhat easily adjustable (much easier in your living room), but sometimes a bit cumbersome as they are not mitten/glove-friendly. The straps are often hard to remove after use if they have gotten wet then frozen.

The step-in crampons are for use with mountaineering or double-plastic boots. They will not work with winter hiking boots. These are easy to put on and take off and can be done with mittens/gloves on your hands. They are adjustable, but they must be exactly fitted to your boot, which is not always easy to do on the trail. Once you have your crampons, you will also need a bag to carry these in that the teeth are not going to poke through! You can also purchase “point-protectors” for additional security.

Here’s an AMC “Equipped” blog post on features to consider for crampons:
<http://equipped.outdoors.org/2014/12/get-grip.html>

Trekking/Ski Poles

These are highly recommended in winter as most of the time by default we are moving on a slippery surface; either ice, snow or general wetness. Remember- always maintain 3 points of contact with terra firma! In addition, packs are generally heavier during winter travel so poles aid in balance/stability, weight distribution, and reduce impact to the knees.

Tips on poles:

- Helpful on difficult terrain (steep, slippery) especially with a heavier pack.
- Collapsible are nice so you can put them on your pack when not in use.
- Use winter baskets so the poles don’t sink into the deep snow on the sides of the trail.
- Flip locks, as opposed to twist locks, are more reliable.
- Cork handles are sometimes preferred since they don’t conduct heat away from your hands or attract the cold like hard plastic handles.

Packs and Straps

Winter outdoor travel demands more durable and higher volume backpack than your typical summer pack. By default, higher volume packs are usually more durable than a typical summer daypack because of their intended use. Unless you are doing ice climbing, this level of durability is likely sufficient.

For a typical winter day trip, a pack size of around 2,500 cubic inches is recommended; this is equivalent to about 15-16 loafs of bread or about 41 liters. For an overnight pack, generally packs should be greater than 4,000 cubic inches or about 66 liters. But be careful; the more space you have, the more you may put in it, which will be heavier to tote along.

It is best to purchase a backpack from a retail store where experienced staff can fit you properly. In addition, try your pack on a mini-expedition before your first big trip to get used to the fit, adjust it as needed, and become familiar with its compartments and workings. Don't forget to know how to carry your snowshoes and/or crampons when they are not on your feet! (See more below on lashing).

Things to look for in a winter backpack for a day trip

- 2,500 cubic inches or greater
- Mitten-friendly access to compartments, zippers, and adjusting straps
- Sternum strap to keep it tight to your body when on the move
- Loops and buckles on the outside to lash gear to
 - Avoid excess from being able to “fwap” you in the face during windy conditions
- Clip/special zipped pocket for your car keys
- Rain cover to fit over your pack to keep snow off
- Some packs come with heavy-duty waterproof material on the bottom for when you set it down in the snow.

Lashing Straps and/or Bungee Cords

What to do with your snowshoes when they are not on your feet? Or, your crampons? Or, both? Make sure your pack has loops to receive external straps and/or bungee cords when these items are affixed to the outside of your pack for transport when not in use on your feet. Proper length bungee cords work well. Adjustable straps with buckles also work well and can be purchased at many outdoor gear stores. Get a system that works for you and your pack and know how to attach and remove items quickly.

How to pack a pack?

- Keep center of gravity as close to your middle and lower back as possible.
- Heaviest items against the back, and progressively lighter as you go out and up.
- Avoid heavy items in the area below the hip belt.

- Keep items you will likely need throughout the course of the day near the top or in an outside compartment. These include: snacks, water, outer layer you wear during breaks, spare gloves.

Food and Water

Food

One of the best rewards for hiking besides the view from the top and the spirit of the season, is eating. There's an unofficial saying in the AMC that we are really an eating club with a hiking disorder!

- Diet for extended winter hiking should be 50-60% carbohydrates, 25-30% fat, and 15% protein.
 - 0.5 to 0.75 grams of protein/pound of body weight/day for recreational athletes
 - 0.6 to 0.9 grams of protein/pound of body weight/day for competitive athletes or those trying to build muscle
- Be sure and take things that do not freeze. Even energy/granola bars will get very hard. So unless you are looking for a trip to the dentist, it is a good idea to cut them up prior to the hike into bite size pieces. Cliff Bar now sells "Cliff Bites". Also, keep them in an inside jacket pocket to prevent freezing.
- Remove any excess packaging for all food items; this will be cumbersome to remove with mittens on and you will have to carry it out.
- Breakfast- be sure and eat one! Some combination of carbs, fat, and protein/fat such as a bowl of oatmeal and a couple of eggs make a great breakfast before a winter hike.
- Lunch- this "meal" starts right after you leave the parking lot and ends when you get back to the parking lot. Suggestions include:
 - PB&J's (peanut butter and jam)
 - GORP (good old raisins and peanuts), dried fruit
 - Beef jerky, pepperoni, cheese
 - Energy/granola bars/cookies
- You should eat something at least every 2 hours to keep energy levels up and to stay warm. It is much better to eat a small amount several times a day; be a grazer!

Water

Facts We are 55-60% water by weight so water is very important during outdoor activities.

- Males = 60%, females = 55%, kids = 70%.
- Lean muscle tissue contains about 75% water by weight- gets us up hills.
- Lungs 90% water- gets us up hills.
- Blood contains 80-90% water- digests our food into energy.
- Body fat contains 14% water- keeps us warm.
- Bone has 22% water.
- Skin also contains much water.
- Brain is 90% water- make good decisions.

How much water to drink? Drink half of body weight in ounces each day

- 20% can come from food, if practice a healthy diet.
- There are about 34 ounces in a liter. So if you weigh 150 pounds, you should drink 75 ounces or about 2.2 liters- **on a regular day.**
 - The body can only adsorb about a liter an hour.
 - It is easier to prevent dehydration than fix it.
 - Can drink too much water and dilute electrolytes.
- “Hydration Calculator” at:
 - <http://nutrition.about.com/library/blwatercalculator.htm>
 - Factors are: weight, minutes of exercise, high altitude, dry climate, weather extremely hot or cold.
- If you lose 2.5% body weight from water loss then there is a 25% reduced efficiency.
 - By the time you feel thirsty, it is too late- already under-hydrated.
 - So Sprite has their slogan all wrong “Obey your thirst!”
- Signs of under hydration and dehydration
 - Dark urine
 - Irritability
 - Dry mouth
 - Light-headedness
 - Headache
- Treatment of dehydration
 - Drink slowly
 - Rest
 - Get out of the sun

Prevent freezing

- Leave bladders (CamelBacks, MRS, Osprey etc.) at home; they WILL freeze.
- Use bottle insulators (or socks), and start with hot water.
- Add flavoring if drinking hot water is not palatable to you.
 - Ex. tea, hot chocolate
- As water bottles get close to empty, put them up-side-down in insulator so the cap doesn’t freeze on.
- Use wide-mouthed bottles.

Training and Conditioning

Everyone who participates in any winter outdoor activities wishes they were in better physical shape. No matter how strong you are, the mountains and trails are a hurdle. Winter outdoor activities are always going to be both physically and mentally challenging. That is why they are so satisfying! Many participants arrive questioning whether they will be able to keep up on a trip. Prior years' experiences have shown that those who conscientiously follow a training program and have ventured out on a cool-weather hike to test their boots and equipment prior to the chosen activity are generally more fit and self-confident. This helps them maintain a positive attitude and increases their enjoyment.

The well-conditioned winter outdoor enthusiast concentrates on the long-term development of leg, back, and shoulder strength combined with cardiovascular capacity. A month or so before the trip date is not enough time to begin and see results from a comprehensive fitness program (8-12 weeks is common for fitness program results). In the short term, the most beneficial gains can be realized by devoting available training time to cardiovascular improvement rather than to a crash strength-building program. The key point is *to start some kind of fitness program now!* Five days of running the week before your hike or ski will do essentially nothing for your overall fitness, and it may instead cause injury. But a steady and thoughtful exercise program over the period of a couple of months can have substantial benefits.

Physical expectations will vary with each group and activity you participate in. Our goal is to provide winter activities at various levels of difficulty. Selecting an activity that is appropriate for your fitness level is very important. It can be frustrating, and possibly unsafe, when a participant is under or over qualified. Leaders and co-leaders are very willing to help you select the activity appropriate to your ability.

It is unrealistic to expect that all participants have the time to follow a daily exercise regimen.

Improvement will be evident with a logical program that gets your heart rate elevated 3 or 4 times per week for 30-45 minutes. The absolute number of miles, hills, repetitions, minutes, etc. should vary according to the terrain and the individual. Remember that you really cannot be over-conditioned. The key is that for you to set your training level so you feel you have really accomplished something. It is always wise to speak with an experienced professional trainer and doctor before beginning any exercise program. This is particularly true if you have any outstanding medical conditions.

Suggested Activities (Cardio-vascular and strength):

- **Hiking:** The best way to train for a hike is to go out and do it! Choose an area with some good hills. If you only have time for a short hike, add some extra weight to your pack.

- **Aerobic Fitness Classes:** Be sure to attend a class that leaves you sweaty and tired at the end. Otherwise it is a waste of valuable time.
- **Running:** Excellent aerobic exercise. Do some hills. But, it can be hard on the knees.
- **Cross Country Skiing:** Try to include hill climbing and carry weight in your pack.
- **Bicycling:** Easier on the knees than running. You can improve the quality of your workout by choosing a hilly course and by getting up off the saddle for the uphill. Try an exercise bike in the winter.
- **Snowshoeing:** Try to include hill climbing and carry weight in your pack.
- **Aerobic Machines- Stair-Masters, Elliptical, X-C ski Machines:** Another excellent way to humble yourself, as well as get a good workout. If the machine is so equipped, choose a level of exercise so that you can stay on for about 30 minutes.
- **Back, Leg, and Core Strength Training:** Leg squats and abdominal crunches followed by back arching stretches will improve your ability to lift heavy packs and carry them. And don't forget your core; try any exercise that uses the plank position.
- **Yoga and Pilates:** improve core strength, flexibility, and efficient breathing.
- **Swimming:** Excellent aerobic training with less strain on the joints.

Stretching for hiking from Backpacker Magazine on-line

<http://www.backpacker.com/august-2011-how-to-walk/skills/15843?page=7>

Strength training from Backpacker Magazine on-line

<http://www.backpacker.com/skills/fitness/how-to-walk/1/>

<http://www.backpacker.com/skills/fitness/train-smarter/4/>

General Principles to Stay Warm

- To stay warm, stay DRY!
- It's easier to *stay* warm than to *get* warm; preserve your heat by layering up on breaks even if you don't feel cold.
- Eat often and stay hydrated.
 - Keep snacks in an inside jacket pocket to prevent freezing and keep them handy.
- Sweat now = Freeze later.
 - Regulate your body temp with a hat and hood combination.
 - Start off wearing both in the parking lot.
 - Then, remove the hood, finally remove the hat if needed.
 - At a break, put the hat and hood back on immediately, regardless of how you feel.
- Cold hands
 - Change to mittens or gloves with more insulation.
 - Don't use poles if you don't have to; gripping can constrict blood flow. The grips themselves can conduct heat away from your hands, and having your hands up higher versus down at your side makes it harder to pump blood up there.
 - Stop and make vigorous circles with your arms, or swing them briskly back and forth.
 - Use chemical heat warmers.
 - Keep an extra pair of mittens/gloves inside your outer layer where they will stay warm.
- Pacing
 - Start slow and slowly increase speed.
 - Move at a moderate, steady pace that avoids sweating.
 - Start off feeling a little under dressed; you will warm up as you hike.
- Breaks and Time Management
 - Keep breaks under 5 minutes to avoid chilling; there is often not a longer lunch break when conditions are too wet or cold to sit and eat.
 - First, put on a hat, regardless of how you feel.
 - Learn to put on your crampons and snowshoes very quickly.
 - Practice while wearing gloves, then mittens.
 - Practice in the dark.
 - Practice in the dark wearing mittens!
 - Plan your moves.
 - Adjust footgear, eat, drink, urinate, adjust clothing and footgear.
 - Lunch starts right after breakfast and ends when we get back to the parking lot.
 - Keep easy to eat food where you can reach it without removing your pack. Bring easy to eat trail snacks such as granola bars. Open them and

break them into pieces before you leave, so you don't have to remove your glove liners.

- Store water in readily accessible, insulated containers.
- o Ask for help. It's much quicker and less tiring to get items of each other's pack pockets than to remove the pack and put it back on.
- o If you're too warm, remove hat then clothing last; if you are too cold, add clothing first, starting with a hat.

The leader may ask everyone to eat and drink, adjust clothing, or put on (or remove) crampons or snowshoes. Doing this as a group saves time and energy. The leader knows the trail and what lies ahead, and may have good reason to ask you to do this now. Where possible, move off the trail; at least put your pack off trail. Prior to reaching summit or tree line, put on hat, activate hand warmers and store in mittens.

- When the break is over:
 - o Check for dropped gear.
 - o Check other's pack zippers and straps to prevent loss of vital gear.
 - o Resume hiking wearing your hat; remove it as you re-warm.
 - o Do not leave until everyone is actually ready to go.
- Spacing
 - o On steep terrain, stay 10-15 feet apart.
 - o Maneuver over tricky spots one at a time.
 - o Don't pass in tight or tricky spots.
 - o On an open slope, stay out of each other's fall line: look above and below.
 - o Please don't scatter on the summit.
- Low-Impact Hiking
 - o Carry in, and carry out.
 - o Don't damage the treadway for others.
 - Bare-booting leads to postholes, which can trip up snowshoes and skis.
 - Glissading turns the trail into a luge run.
 - o Urinate in a non-obvious place, and cover it; yellow snow is a real eye-sore.
 - o Toilet paper should be carried out, not buried in the snow.
 - o When buying gear, consider the color and its effect on others. Bright colors are safer, but obtrusive.
- General Etiquette
 - o Watch your ski pole tips and ice axes.
 - o Regroup at junctions.
 - o Don't trap the person behind you on a steep slope, on a bridge or in a stream crossing by where you stop.
 - o Warn the next person of hazards; branches at head level are common in the winter.
 - o If you lose the next person, call forward to stop the group.

- Keep your headlamps aimed low.
- Most accidents occur just before lunch (when people generally have not eaten enough), or late in the day when people are tired and are hurrying down.

Equipment List for Winter Hikes

Foot Gear

- Boots: Waterproof, insulated winter boots are required
- Socks: wool or synthetic, sock liners, spares
- Gaiters
- Ski poles (ideally adjustable and with snow baskets)
- Snowshoes with crampons and/or XC skis and boots
- Crampons and/or mini-crampons
- Ice axe, only if you know how to use one safely
- Foot and hand warmer chemical packs

Clothes

- Polypro long underwear (2 tops and 1 bottom). Zip-necks work well.
- Long pants: wool, pile or fleece (no jeans or corduroys)
- Long sleeved shirt: wool or fleece (not cotton or flannel)
- Sweater, jacket or vest: fleece, wool or down (no cotton sweatshirts) (best if it unzips fully to vent)
- Wind and rain pants and jacket with hood (no ponchos)
- Hat plus a spare, balaclava and/or neck gaiter if cold and windy
- Face mask and ski goggles (for above tree-line outings)
- Glove liners, mittens and over-mitts plus spare liners and mittens
- Down parka, for lingering on summit

Other

- Pack: with waterproof cover or liner and extra room for group gear
- Food: lunch, high energy snacks and emergency rations (fruit will freeze)
- Water (2-3 liters) in insulated wide-mouthed containers
- Topo maps or other detailed maps, guidebook (at least 2 members of group)
- Compass and plastic whistle. Keep readily accessible, not in your pack.
- First aid kit with complete ID, insurance card, and personal medications
- Repair kit (e.g., 2 garbage bags, wire, wire wraps, cord and duct tape)
- Sunglasses, sunscreen, and lip balm/sunscreen
- Headlamp or flashlight with fresh batteries, warm spare batteries, and bulb
- Toilet paper with matches and extra zip-loc bags (don't bury in snow!)
- Knife
- Camera and film; binoculars

Group Gear (to be split up)

- Stove, fuel, pot, thermos with hot drink

- Sleeping bag, foam pads
- Emergency shelter (tent or tarp), group first aid kit

Suggested Things To Do

- Check and fuel car. 30 below zero is not uncommon. Add gas line antifreeze.
- Replenish first aid kit.
- Check and pack gear early, not the night before.
- Leave towel and spare clothes in car.

AMC Activities Risk Statement

The activities on AMC outings involve varying degrees of danger. When you participate in an activity you should be both physically and mentally prepared and equipped with appropriate gear. You should always be aware of the risks involved in outdoor activities and conduct yourself accordingly. The trip leadership is not responsible for your safety - **you are**. Before registering for any activity, you are encouraged to discuss your capabilities with the trip leader.

In order to participate in AMC activities, individuals under 18 years of age must be accompanied by a parent or responsible adult. Prior consent from the trip leader is required if a person other than a parent accompanies a minor. Those accompanied by a minor are responsible for the minor's actions.

Trip waiver form- to be signed by all trip participants:

<http://www.outdoors.org/pdf/upload/volreleaseMember.pdf>

Please inform the leaders of the following:

- If you have any medical conditions or take any medications
- If you have allergies to food, drugs, bee stings, etc.
- Who should be contacted in case of accident or illness

For More Information

Outdoor Activities in Winter

- Stephen Gorman, *The Winter Camping Handbook*, 2007
- Yemaya Maurer & Lucas St. Clair, *AMC Guide to Winter Hiking & Camping*, 2009

Gear and Reviews

- AMC web pages
<http://www.outdoors.org/recreation/snow/>
<http://www.outdoors.org/winter-camping.html>
- Equipment information
 - AMC Publications
<http://www.outdoors.org/publications/outdoors/archives/equipped.cfm>
 - Backpacker Magazine on-line
<http://www.backpacker.com/>
 - Outdoor Gear Lab
<http://www.outdoorgearlab.com/>
 - How to choose the best winter gear; blog spot from AMC:
<http://equipped.outdoors.org/2012/11/how-to-choose-best-winter-gear.html>

Snowshoeing

- Gene Prater and Dave Felky, *Snowshoeing*, 2002
- Eli Burakian, *Basic Illustrated Snowshoeing*, 2012

Trails

- AMC White Mountain Guide, includes maps
- AMC Maine Mountain Guide, includes maps
<http://www.outdoors.org/publications/books/index.cfm>
- Daniel Doan and Ruth McDougall, *Explorer's Guide Fifty Hikes in the White Mountains*, 2013
- Daniel Doan and Ruth McDougall, *50 More Hikes in New Hampshire*, 3rd ed., 1998
- John Gibson, *Explorer's Guide 50 Hikes in Coastal and Inland Maine*, 2013

Trail Etiquette

- Laura & Guy Waterman, *Backwoods Ethics*, 1993; *Wilderness Ethics*, 1993
- Leave No Trace
<http://www.lnt.org>

Weather Forecasts and Radar

- Mount Washington Weather Observatory
http://www.mountwashington.org/weather/summit_forecast.php
- NOAA digital graphical forecasts for Maine
<http://www.weather.gov/forecasts/graphical/sectors/maineWeek.php#tabs>
- National Weather Service text zone forecasts for Maine
<http://www.state.me.us/mema/weather/weather.htm>
- Portland, Maine, radar
<http://www.intellicast.com/National/Radar/Summary.aspx?location=USME0328>
- Northeast U.S. radar
http://radar.weather.gov/Conus/northeast_loop.php
- National Weather Service, Mount Washington New Hampshire zone weather forecast
<http://www.mountwashington.org/weather/summit.php>

Mountaineering (Crampons, Use of Ropes, Avalanche Safety, etc.)

- Don Graydon, ed., Mountaineering: The Freedom of the Hills, 2005
- Self-arrest ice-ax YouTube video
<http://www.youtube.com/watch?v=YyRF6AjAI94&feature=related>

Instruction in Snowshoeing, Backcountry XC skiing, Winter Backpacking and Winter Leadership

- AMC Courses taught at Pinkham Notch, NH, cover clothing, map & compass, use of snowshoes, ice axes and crampons, emergency bivouac procedures, etc. Classroom and on-the-mountain training are available.
<http://www.outdoors.org/recreation/leadership/index.cfm>
- ADK Winter Mountaineering School. The Adirondack Mountain Club has sponsored Winter School for over 50 years. The purpose is to promote enjoyable and successful winter mountaineering and camping, focused on learning by doing. Registration required.
<http://www.winterschool.org/index.html>

Places to Buy and Rent Winter Equipment, and Destinations

* = Local retailer

- *Eastern Mountain Sports (EMS)- Portland and South Portland
<http://www.emsonline.com>
 - Broad selection of mid-range products
 - Excellent return policy
 - Rent snowshoes and XC skis.
- *Eastern Mountain Sports (EMS)- North Conway, NH
<http://www.emsonline.com>
 - Broad selection of mid-range products
 - Excellent return policy
 - Rent snowshoes, boots, tents, sleeping bags, pads, packs and XC skis.
- *Recreational Equipment Inc. (REI)- Reading, MA
<http://www.rei.com>
 - Mail order and retail co-op
 - Wide selection, store brands
 - Good return policy
 - Rent winter boots, crampons (if boots rented), ice axes, snowshoes, XC skis, & camping gear.
- IBEX- Boston
<http://www.ibexwear.com/shop/index.php>
 - Quality wool clothing from base to insulating layers
 - Expensive
- *International Mountain Equipment (IME)- North Conway, NH
<http://www.ime-usa.com/>
 - Retail and mail order
 - High-end mountaineering gear
 - Experienced staff- Owner Rick Wilcox has summited Everest and does winter search & rescue work as a volunteer.
 - Used gear offered upstairs on consignment.
 - Offers mountaineering courses.
 - Rental gear available: boots, crampons, snow shoes, sleds, tents, sleeping bags, pads, stoves, XC ski gear, etc.
- *Ragged Mountain, Inc.- Intervale, NH
<http://www.raggedmountain.com/>
 - Retail store
 - Excellent selection, higher end gear, manufacturer of clothing
 - Limited return policy

- Good selection of “sew-your-own” fabrics, patterns, etc.
- Small consignment shop
- Rents cross-country skis and snowshoes.
- *L.L. Bean- Freeport, ME
<http://www.llbean.com>
 - Good selection, many house brand products
 - Excellent return policy
 - Rents cross-country skis and snowshoes.
- *Epic Sports- Bangor, ME
<http://www.epicsportsgear.com/>
 - Good selection of outdoor clothing, snowshoes, packs
 - Friendly, helpful staff
- *Maine Sport Outfitters- Rockport, ME
<http://www.mainesport.com/>
 - Good selection of outdoor clothing, snowshoes, packs
 - Friendly, helpful staff
 - Rentals and instruction

Web/Mail order

- Campmor
<http://www.campmor.com/>
 - Variety of recreational gear and clothing at great prices
 - Odds and ends of the hard to find stuff
- Sierra Trading Post
<http://www.sierratradingpost.com/>
 - Limited selection; lots of seconds and unwanted colors
 - Great values
- Wiggy’s Inc.
<http://wiggys.com/>
 - Fishnet underwear, booties, insulated sweaters, excellent sleeping bags
- Mountain Gear
<http://www.mountaingear.com/>
 - Great selection of recreational and mountaineering equipment
 - Good sales
- Backcountry
<http://www.backcountry.com/>
 - Great selection of recreational and mountaineering equipment
 - Good sales

- Steep And Cheap
<http://www.steepandcheap.com/>
 - Sell one item at a time until it is gone
 - Variety of merchandise
 - Huge discounts

Destinations

- AMC Maine Wilderness Lodges
<http://www.outdoors.org/lodging/mainelodges/>
 - Year round lodges and cabins
 - Winter ski or snowshoe in
- *AMC Highland Center, Bretton Woods, NH
<http://www.outdoors.org/lodging/whitemountains/highland/index.cfm>
 - Gear rentals, lodging, trips, workshops
- AMC Pinkham Notch Center, Coos, NH.
<http://www.outdoors.org/lodging/whitemountains/pinkham/pnvc-pnvc.cfm>
 - Year-round lodging and meals
 - Instruction and guided trips
- AMC White Mountain Huts, NH
<http://www.outdoors.org/lodging/whitemountains/>
 - Three huts are open in the winter: Carter Notch, Zealand, and Lonesome Lake.
 - Ski or snowshoe in
- Maine Huts and Trails
<http://www.mainehuts.org/>
 - Year round lodges and cabins
 - Winter ski or snowshoe in