Getting outfitted for mountaineering can be a daunting task. We are proud to offer a curated selection of some of our favorite equipment picks.
ALL ABOUT GEAR

This lexicon offers a simple, item-by-item description of the purpose and use of each piece of gear generally needed for a variety of mountaineering objectives.

Mountain climbing is an intensely equipment-dependent activity. Due to the extreme nature of the environments mountaineering takes us to, we depend on our equipment not just for comfort and performance, but ultimately for safety and survival. Having good equipment in the mountains is a crucial foundation for increasing your chance of having a successful climb.

This lexicon represents decades of in-field knowledge and expertise by a multitude of guides, instructors, and climbers. We have found that by being well-equipped on climbs and expeditions we are able to succeed in conditions that force other teams to turn back. Alpine Ascents constantly strives to stay on the leading edge of clothing & equipment technology, and this lexicon is updated regularly so as to offer the best information available.

WE'RE HERE TO HELP

Our staff works with our equipment partners year-round to provide the best possible gear selection for our shop and for our guided trips. Our expert gear staff is happy to help you with the outfitting process: choosing the right gear, advising on fit, or deciding whether to rent or buy.
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A WORD ON LAYERING

One of our most frequently asked about subjects is layering. Specifically, how does one properly layer clothing for safety & comfort in the mountains? The best place to start is with the simple five-part system outlined here. Layering is a unique and challenging concept. Each climber stays comfortable with a slightly different system. With years of practice, it is possible to hone a layering system so that it is easy to stay comfortable in any conditions during a climb or trek.

(1) BASELAYERS
Also known as long underwear or “long johns”, these layers are worn next-to-skin. While an upper body baselayer is always worn, lower body baselayers may or may not be worn depending on conditions.

(2) MIDLAYERS
Typically used only for the upper body and worn over baselayers, midlayers can take many forms—from lightly insulated garments like the Rab Paradox Pull-On to classic grid-fleece jackets like the Rab Baseline—and offer extra warmth beneath a softshell or hardshell when temperatures are cool.

(3) SOFTSHELLS
Stretchy, very breathable, and both wind and water resistant, softshells can be worn over baselayers or over a baselayer and midlayer. It is common to hear softshell layers called the “action suit” in the mountains!

(4) HARDSHELLS
Waterproof & windproof, hardshells are alpine armor against precipitation and strong gusting winds. Hardshells are often worn as the next layer in deteriorating conditions, but are best avoided as waterproof membranes are not very breathable, and thus trap sweat against the body.

(5) INSULATION
When the mercury dips significantly, insulation is added as the final layer. Counter-intuitively, insulation is added over top of hardshells when necessary, never under hardshells, as insulation is required only once precipitation has turned to snow, which will shed easily from the outer fabric of insulation.
HEADWEAR

HEAVYWEIGHT BALACLAVA

A piece of fabric that covers the entire head and mouth, a heavy balaclava is made of thick synthetic or fleece fabric. Balaclavas are designed to block the wind, and should provide full-face coverage without obstructing vision. The mouth area should be able to vent moisture but still provide warmth. Models without mouth perforations can be cut or punctured at home if necessary. A heavyweight balaclava is critical for avoiding frostbite to your face at high altitudes or in polar regions. Size to fit a lightweight balaclava beneath your heavyweight balaclava.

STAFF PICKS: Rab Powerstretch Pro Balaclava, REI Power Wool Balalclava

LIGHTWEIGHT BALACLAVA

Similar in purpose and construction to a heavyweight balaclava, lightweight balaclavas serve as standalone protection at lower altitudes or in mild climates, or they can be layered beneath a heavyweight balaclava for protection in extreme environments. We recommend a breathable, stretchy material.

STAFF PICKS: Rab Meco Balaclava, OR Option Balaclava, Rab DryFlo Balaclava
BUFF

Neck gaiter, bandana, headband, sun protectant... a buff is a must-have for all outdoor activities! It is a tubular piece of UV-resistant fabric, offering protection from sun, light wind, or cool temperatures. A buff is far superior to a bandana, and is a small but key tool on any trip, whether a shorter trek or a longer expedition.

**STAFF PICK:** AAI Logo Buff

SUN HAT

Any hat, whether a baseball cap or sombrero-style hat, can serve to protect you from the sun in the mountains. You will use this piece on sunny days to keep your head, face, or neck protected from UV radiation. Many styles can work well.

**STAFF PICK:** AAI District Trucker Hat

WOOL/SYNTHETIC HAT

Choose a non-cotton wool or synthetic hat that covers your ears and is comfortable when worn for several hours at a time. For any trip requiring the use of a helmet, a low-profile skull cap-style hat is preferred. For trips not requiring a helmet, thicker beanies are often preferred. Your hat should be air-permeable to allow moisture to evaporate from your head.

**STAFF PICKS:** Rab Merino+ 160 Beanie, Sherpa Adventure Gear Dorje Beanie, AAI Logo Beanie

GOGGLES

Worn when glacier glasses cannot block blowing wind or snow, goggles are key to your ability to travel in the mountains in adverse conditions. Choose a reputable brand to ensure adequate protection from solar radiation, and to ensure a longer lifespan for your goggles. A variety of lens colors can suffice, however, we recommend a Visible Light Transmission (VLT) of approximately 8-35%. While single-lens goggles are sufficient, photochromic lenses which self-adjust VLT are increasingly preferred for excellent visibility regardless of changing conditions. Alternatively, models with interchangeable lens options can offer the same range of VLT for a reduced cost. Your goggles should fit snugly around your face, and must be fitted with your helmet if your trip requires a helmet. Those requiring eyeglasses may opt for prescription goggles or choose a pair designed to fit over eyeglasses.

**STAFF PICKS:** Zeal Slate or Voyager Goggles, Smith Cascade Classic
**Nose Guard**

Completely optional but still preferred by a few mountaineers, a nose guard is a piece of fabric that attaches to your glacier glasses to provide a physical barrier from the sun and wind. Guards are sized to fit your nose, and feature an adjustable attachment loop. Those who quickly sweat sunscreen away may wish to strongly consider a nose guard for high-altitude expeditions.

**Staff Pick:** Beko Classic

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**Sunglasses**

For trekking or travelling mostly on dry trail or below treeline, almost any pair of high-quality sunglasses that provide 100% UVA/B protection will suffice. Wrap-around models are recommended, but more standard models can often suffice. For outdoor travel, polarized lenses are often a plus.

**Staff Pick:** Zeal Essential Sunglasses

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**Glacier Glasses**

Glacier glasses play a key role in any climber’s kit, protecting your eyes from exceptionally bright and harmful UV rays, which are amplified by the snow reflection and grow increasingly strong with increased altitude. We recommend a category 4 lenses with a VLT of approximately 3%-8%. Your glasses must wrap around your face, providing 100% coverage from above, below, and each side of the lenses. In very rare cases, dark, high-quality wraparound sport sunglasses can suffice—however, in the vast majority of cases purpose-built glacier glasses are necessary. For those requiring eyeglasses, we recommend obtaining prescription glacier glasses from Julbo USA or Opticus.

**Staff Picks:** Julbo Bivouak, Julbo Tensing

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**Over-the-Glasses Sunglasses**

In lieu of purchasing prescription glacier glasses, climbers may purchase over-the-glasses sunglasses, which are designed to offer total sun protection while wearing eyeglasses. This setup is significantly less comfortable due to wearing two sets of glasses over your ears, and is significantly more cumbersome for wearing beneath warm hats or helmets.

**Staff Pick:** Cocoons Over-the-Glasses Sunglasses
HEALDLAMP

All modern headlamps are LED powered. We recommend models with +100-250 lumens of output (this measures the brightness). You will use your headlamp to see at night in your tent and for pre-sunrise starts. Weather-resistant models offer a significant advantage in the harsh conditions of the mountains. Your headlamp should fit comfortably on both your helmet and head. Rechargeable models can work well on short trips, but models with replaceable batteries are better for longer trips.

STAFF PICKS: Black Diamond Storm, Black Diamond Spot, Petzl Actik

LINER SOCKS

Worn next-to-skin with a heavier pair of socks layer on top, these very lightweight socks are designed to quickly move moisture away from your skin, reducing the instance of blisters by absorbing friction and keeping your feet dry. Liner socks are typically constructed from synthetic materials. These are not required, but may increase your comfort level.

STAFF PICKS: Fox River Alturas Liner Sock, REI EcoMade CoolMax Liner Sock
**MIDWEIGHT SOCKS**

Designed for comfort and warmth at moderate altitudes and in moderate to cold weather, these socks must be spun from merino wool or synthetic fiber (no cotton!). Midweight socks should be sized to fit snugly but without constricting any blood flow, and must be sized to fit over liner socks if you plan to use liner socks.

**STAFF PICKS:** Darn Tough Hiker Boot Sock, SmartWool PhD Outdoor Medium Sock

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**OVER-THE-CALF MOUNTAINEERING SOCKS**

Designed for comfort and warmth at higher altitudes and in cold to very cold weather, these socks must be spun from merino wool or synthetic fiber (no cotton!). The extra height in this sock adds warmth, increases blood flow to the feet through a gentle compression, and provides extended comfort for longer expeditions or when using boots with integrated gaiters. Size these socks to fit as you would a midweight sock.

**STAFF PICKS:** Darn Tough Mountaineering Over-the-Calf Socks, Smartwool PhD Outdoor Heavy OTC Socks

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**DOWN OR SYNTHETIC BOOTIES**

To be worn in camp or in your tent at high altitudes or in very cold conditions. There are benefits and drawbacks to each insulation material: synthetic booties perform well in very wet environments, since they do not lose loft even when damp, and will remain warm even when wet. However, down booties are typically lighter than synthetic booties, are more packable, and offer a longer lifespan at maximum warmth. Often, booties are worn inside the outer shells of your double boots while moving about camp.

**STAFF PICKS:** Forty Below Synthetic-Fill Camp Booties, Feathered Friends Down Booties

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**WATER SHOES / SANDALS**

Water shoes or sandals are required primarily for stream crossings. Emphasize lightweight designs with good traction. Open-toed or semi-closed toed models are equally sufficient.

**STAFF PICK:** Chaco Classic Sandal, Teva Original Universal
**TREKKING SHOES**

These comfortable shoes should be lightweight, comfortable, and offer excellent traction. Trekking shoes are also sometimes referred to as trail running or approach shoes. A variety of lightweight shoes can serve well as trekking shoes.

**STAFF PICKS:** Scarpa Zen, La Sportiva TX3

**COLD-WEATHER CAMP BOOTS**

Warm, waterproof boots that can be worn around camp. These boots should be non-technical and very comfortable; you will not be hiking or climbing in these boots. Weight and bulk are not concerns for this kind of footwear- emphasize warmth and comfort.

**STAFF PICKS:** Sorel Caribou Boots, Salomon Tundra Pro Boots

**SINGLE MOUNTAINEERING BOOTS**

A boot designed for mountaineering and engineered to accept crampons, single boots are suitable for use in drier, warmer conditions. Choose a model purpose-built for climbing or mountaineering- note that even a sturdy hiking boot does not take the place of a single mountaineering boot! The boot shank (sole) should be rigid and provide significant support, and the boot must be waterproof. Single boots often fit best when sized up one full shoe size from your typical street shoe size.

**STAFF PICK:** La Sportiva Nepal Cube, Scarpa Mont Blanc GTX

**PLASTIC DOUBLE BOOTS**

A workhorse cold-weather boot, plastic boots are used the world over by experienced guides and by rental shops due to their dependable warmth, consistent waterproofedness, and long lifespan even under heavy use. A plastic boot is constructed on a fully rigid sole with a flexible plastic upper, with a soft and flexible inner boot designed to fit inside the plastic shell. Plastic boots may be lined with either a low-altitude liner (suitable to 5000m) or high-altitude liner (suitable to 6000m, or 8000m with an overboot) depending on the intended climbing objective. With proper fit instructions, plastic boots are very comfortable.

**STAFF PICKS:** Koflach Degre, Scarpa Inverno, Lowa Civetta
HIKING BOOTS

Hiking boots should be waterproof with a flexible sole, while still offering cushioned comfort and support underfoot. Gore-tex, OutDry, KeenDry, or a similar waterproof membrane is recommended to keep your feet dry.

STAFF PICKS: Scarpa Kailash GTX, Asolo Fugitive GTX, Keen Targhee II Mid

LOW-ALTITUDE PLASTIC BOOT LINER

Soft, flexible, and simple in construction, a low-altitude plastic boot liner provides sufficient warmth for plastic double boot use up to approximately 5000m- and looks similar to a house slipper. These liners are typically designed to dry quickly, and may feature either laceless or lace-up closures. A stand-alone liner can often be purchased for use with a used plastic boot shell. Liners may be heat-moldable, or may be constructed of standard non-thermoforming materials.

STAFF PICKS: Sorel Caribou Boots, Salomon Tundra Pro Boots

HIGH-ALTITUDE ACCESSORY BOOT LINER

Constructed to fulfill the same purpose as a low-altitude plastic boot liner, but designed to offer even greater warmth, high-altitude boot liners allow climbers to travel to heights such as the summit of Aconcagua in plastic double boots. Without question, the best high-altitude liner for mountaineering is Intuition’s Denali Liner. The Denali is an exceptionally light, exceptionally warm thermo-moldable liner that fits well in a variety of plastic double boot shells.

STAFF PICK: Intuition Denali Liner

LOW-ALTITUDE DOUBLE MOUNTAINEERING BOOTS

Unique to the Arc’teryx brand and representing new technology in the mountaineering world, low-altitude, non-plastic mountaineering boots are a climber’s dream come true for cool, damp climbing conditions such as those found in Washington’s Cascade Range. These boots offer the benefits of a double boot—the liner can be removed and dried out—but are lightweight and low-bulk, meaning they are comfortable for use in more moderate environments.

STAFF PICK: Arc’teryx Acrux Boot
HIGH-ALTITUDE DOUBLE MOUNTAINEERING BOOTS

Warmer than a single mountaineering boot, these boots are constructed with a removable insulated liner which nests into a durable waterproof outer boot. Beyond offering greater warmth and waterproofness than a single boot, the liner of double boots may be removed, allowing you to dry out your boot liners day-to-day—a feature which is absolutely key on longer expeditions. Double boots are constructed with fully-rigid soles to allow climbing on flat to vertical terrain with or without crampons. These boots are ideal for longer trips even in moderate conditions, or may be used on expeditions to higher altitudes such as Aconcagua. In combination with overboots, high-altitude double boots are suitable for use as high as the summit of Denali or Ama Dablam!

STAFF PICKS: La Sportiva G2 SM, La Sportiva Spantik

HIGH-ALTITUDE ALL-IN-ONE BOOTS

Alternatively called “triple boot” or a “single boot system”, high-altitude all-in-one boots are the warmest boot style on the market. They are constructed of a warmer material than high-altitude double boots, and offer the extra warmth and waterproofness of an insulated and integrated gaiter. These features make an overboot and separate pair of gaiters unnecessary. This style is best-suited for trips to Cho Oyu and Mount Everest, although they are growing increasingly popular on peaks like Denali, Mount Vinson and even Aconcagua.

STAFF PICKS: La Sportiva Olympus Mons Evo, Scarpa Phantom 8000

OVERBOOTS

Overboots are used in combination with a high-altitude double-boot to offer just enough extra warmth to achieve summits like Denali. Overboots are designed to wrap insulation entirely around the boot (like a sock for your boot), and are usually constructed of neoprene with reinforcements in high-wear areas. Crampons with a heel bail and toe strap fit with overboots the best; however, crampons with a heel bail and toe bail can still be utilized with overboots.

STAFF PICK: Forty Below Purple Haze Overboot
SNOWSHOES

Used for backcountry travel in deep or unconsolidated snow. We recommend snowshoes constructed of a rigid plastic composite decking, and strongly recommend traction bars, aggressive crampons on a rotating binding, and fully adjustable straps. Heel-riser bars have become increasingly key for sustained uphill travel. Do not bring snowshoes designed for light use or flat terrain use.

STAFF PICKS: MSR Revo Ascent, MSR Lightning Ascent

GAITERS

Used to keep snow and other debris from entering your boots, gaiters are a tube of fabric which fit over your boots. For most climbing trips, we recommend taller gaiters designed for mountaineering. For trekking trips or climbs in the Alps, where trails are well-travelled, shorter trekking gaiters can be sufficient. Regardless, choose gaiters with a durable, waterproof construction. Fit your gaiters to eliminate gaps between the gaiter and your boot, but avoid fitting too snugly on the ankle and calf.

STAFF PICKS: Outdoor Research Crocodile Gaiters, Rab Latok Alpine Gaiters
LIGHTWEIGHT LINER GLOVES

Generally very lightweight and moisture wicking, liner gloves represent the lightest handwear used in the mountains. Fit your liner gloves snugly, but without constriction of blood flow. Liner gloves serve several purposes: when temperatures are warm but the sun is strong, they can serve to protect your hands from sunburn. When at high altitudes or in very cold conditions: liner gloves can be worn beneath heavier layers to allow you to quickly accomplish fine motor tasks without ever exposing your skin. Some prefer light colored liner gloves, especially in situations where significant time is spent on lower altitude glaciers or snow.

STAFF PICKS: OR PL Base Sensor gloves, OR Chroma Full Sun Gloves

SOFTSHELL GLOVES

Often referred to as a “ski glove”, softshell gloves come in a variety of weights, styles and warmths, but are generally designed to offer weather protection and insulation in cool to cold conditions while minimally impacting dexterity.

While many different softshell gloves can serve you well in the mountains, we recommend looking to models featuring a durable & non-absorptive outer fabric, with leather palms for grip and durability while handling ropes or ice axes. Climbers who “run hot” can often use a lighter softshell glove, whereas climbers who often experience cold fingers will want to use a warmer, heavier model of softshell glove.

Fit your gloves snugly, but be sure not to constrict blood flow or finger movement. Different brands of gloves may fit you differently- we recommend trying on several brands as you select your gloves.

STAFF PICKS: Rab Baltoro Gloves, Rab VR Tour Gloves, Black Diamond Impulse Gloves

INSULATED MITTENS

The “little sibling” of heavier expedition-weight handwear, insulated mittens are worn at lower altitudes, when the temperature is too cold for gloves to provide sufficient warmth. We recommend choosing mitts made with a waterproof/breathable shell and removable insulated liners. Note that mittens without removable liners are often significantly less warm!

Fit your mittens more loosely than you might a pair of gloves, but so that they easily remain on your hands during active use.

STAFF PICK: Rab Alliance Mitt, Mountain Hardwear Medusa Mitt, Black Diamond Guide Finger Gloves
EXPEDITION GLOVES

For higher altitude climbing or polar exploration, a pair of thick, insulated gloves with an insulated and removable liner is key. These extra-warm gloves allow for sufficient dexterity while climbing even in very cold conditions. A removable liner allows for modular use in changing conditions.

Choose a model with a waterproof/breathable shell and removable synthetic inner glove. Look for gloves with curved fingers, a cinch strap at the wrist, cinch cord at the gauntlet and an wrist keeper leashes (to prevent dropping gloves in windy conditions).

STAFF PICKS: OR Alti Gloves, Black Diamond Guide Gloves

EXPEDITION MITTS

High-altitude expedition mountaineering mittens are designed to keep your hands warm in the most extreme conditions. Look for a mitten that is advertised for use on 8000m peaks or for polar exploration—ordinary ski mittens will not suffice! Either down or synthetic-insulated models are sufficient.

Size your mittens so that your lightweight liner gloves can fit comfortably inside without constricting blood flow to your fingers.

STAFF PICKS: Rab Expedition Mitts, OR Alti Mitts

HAND WARMERS

Disposable, one-time use chemical heat packs are immensely useful and can, for some, be absolutely necessary for higher altitude summits. In certain situations, only the extra warmth of a chemical heat pack will help your hands warm up. These are a light, compact safety net well worth carrying to cold locations.

STAFF PICK: Little Hotties Hand Warmers
ACCESSORY CORD

Used primarily for making prussiks (friction knots used to ascend a rope or create a crevasse rescue system), accessory cord is a key item for most mountaineers. Often, cord can be purchased by the foot from climbing shops. Good quality cord has a “soft hand” (i.e. it bends easily). 6mm cord is preferred as the ideal diameter for good friction on modern climbing ropes but with sufficient extra strength margin for normal usage. Standard nylon cord is preferred for most uses, although in special cases newer Spectra/Dyneema cord can be ideal.

Please note that cord larger than 6mm is often too large for use in friction hitches on modern ropes, and that cord smaller than 5mm offers a significantly reduced breaking strength when compared to 6mm cord.

STAFF PICK: PMI Accessory Cord

SLINGS

Slings (or runners) are pieces of climbing-spec webbing pre-sewn in a loop, and sold at a variety of lengths. Construction materials can range from nylon to spectra, dyneema to dynex. While most materials are suitable for most uses, we recommend carefully reading requirements when purchasing gear, as there are situations in which the [cont'd]
SLINGS CONT'D

construction materials of your sling are more important.

Pre-sewn slings are measured from end-to-end as sewn, and are NOT measured by the length of total material utilized. A single-length sling is 60cm or 24” in length, whereas a double-length sling is typically 120cm or 48” in length. In modern climbing, pre-sewn slings have superseded tied webbing slings, though lengths of webbing still have certain applications.

STAFF PICKS: Black Diamond Dynex Runner, Mammut Contact Sling

ASCENDER

This mechanical rope-gripping device is used to ascend fixed ropes, whether they are hung vertically or less than vertically. A mechanical cam with uni-directional teeth slides easily up a rope, but grips the rope as the ascender comes to a stop, allowing for easy & safe upwards travel.

Ascenders are sold in right or left-handed designations, which denotes what thumb operates the camming device in one-handed operation. This designation is not important for mountaineering, as the fixed ropes on climbs like Island Peak or Denali will require ascender use with both hands. With a single “hand size” offered, each ascender is more or less universal, and each typically offers a suitably wide range of rope compatibility from 8-13mm in diameter.

STAFF PICKS: Petzl Ascension Ascender, Black Diamond Index Ascender

AVACHANCE TRANSCIEVER

Transceivers are worn while traveling in areas where there is potential for avalanche risk. Digital units are a must. Antiquated analog units are no longer considered acceptable for use. Digital units operate at a standard frequency of 457 mhz. While many of the features of more expensive units are unnecessary for mountaineering use, we do recommend 3-antenna models and models with a greater transmission range. If you plan to use your transceiver for backcountry skiing, extra transceiver features become more important, as each feature increases your safety margin by making you a more effective rescuer or more easily-found victim.

STAFF PICKS: Mammut Element Barryvox, BCA Tracker3
BELAY DEVICE

For mountaineering and alpine climbing, we recommend a simple tube-style device designed for climbing rappelling and climbing belaying. Older “figure-8” style devices are preferred only for specific end-uses, such as canyoneering. Your device should be double-slotted and fit rope sizes 8mm-11mm. V-style or high-friction slots are beneficial but not required, as they help increase braking power.

Assisted-braking devices like the Petzl GriGri 2 are excellent for certain situations (single-pitch cragging, long big-wall belays, climbing gym sessions, etc.), but do not take the place of a tube-style belay device.

STAFF PICKS: Black Diamond ATC Guide, Petzl Reverso

NON-LOCKING CARABINER

Many styles of non-locking or standard carabiners are available today. However, for mountaineering applications, lightweight D-shaped models with a wiregate closure are preferred. Solid-gate models freeze more easily, and are heavier to carry.

Consider your end-use as you purchase standard carabiners- if you will need to operate your carabiner while wearing gloves, models with a larger body & larger opening are ideal, like the Black Diamond Hotwire or Camp Photon Wiregate. For lightweight pursuits or dry rock climbing, smaller-bodied models like the Black Diamond Oz can be ideal.

STAFF PICKS: Black Diamond Oz Carabiner, Black Diamond Hotwire Carabiner

LOCKING CARABINER

These carabiners have a locking mechanism on the gate, allowing them to be securely closed. Locking carabiners are available with either an “automatic” or “twist” lock, or a more standard “screwgate” lock. For most purposes, screwgate locking mechanisms are significantly preferred over twist locking mechanisms.

A variety of sizes and styles of locking carabiners are available; as with selecting non-locking carabiners, consider the end-use you intend for your locking carabiner. A smaller locking carabiner is ideal for securing a sled to a pack trace, whereas a larger carabiner is better for use on your climbing harness.

STAFF PICK: Black Diamond Positron
**Belay Carabiner**

These are the largest type of locking carabiner and have a larger gate opening and inner diameter as compared to other carabiners. They are generally used in conjunction with your harness and other mechanical devices for roped travel—like when belaying or rappelling. Either an auto-locking or screw-locking carabiner can be suitable. Belay carabiners are also ideal for building rock anchors or creating a masterpoint.

**STAFF PICK:** Black Diamond Vaporlock Screwgate

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**Ice Axe**

For general mountaineering, a straight-shafted ice axe with a pointed spike, standard-curved pick, and adze is ideal. These axes are used as a piolet (cane) for stability, for self-arrest in a fall and for chopping ice for a tent platform.

Many models are available with varying features and construction. Aluminum models are less durable, but significantly lighter in weight, whereas steel models are far more durable but heavier. Steel models are preferred on longer expeditions or when you may travel across rocky terrain with your axe, such as on Mount Rainier’s Disappointment Cleaver route. You may elect to choose models with other features, such as a rubber grip, based on your personal preference.

Ice axe sizing is always approximate—some prefer a longer axe, which is ideal for lower-angle travel, while others prefer a shorter axe, which is lighter and more ideal for higher-angle travel. As a rough guide, you may size your axe by height:

- under 5’2” – 50cm axe
- 5’3” to 5’7” – 55cm axe
- 5’8” to 5’11” – 60cm axe
- 6’0” to 6’2” – 65cm axe
- above 6’3” – 70cm axe

**STAFF PICKS:** Black Diamond Raven Ice Axe, Petzl Glacier Ice Axe

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**Ice Tool**

Featuring a curved shaft and aggressively recurved pick, these are used to climb steep alpine or water ice. Modern ice tools also feature an exaggerated hand grip for support in vertical environments. Choose a tool appropriate to your intended climbs. Exceptionally curved tools designed for high-end mixed climbing are less appropriate for moderate ice climbing and vice versa.

**STAFF PICKS:** Petzl Quark, Black Diamond Viper
HYBRID ICE AXE

“In between” a standard, straight-shafted ice axe and a more aggressive ice tool, a hybrid ice axe features a curved shaft, a dedicated grip, and is typically available with different head configurations- the pick may be standard or recurved, and the rear of the head may feature an adze or a hammer. A hammer and recurved pick become more desirable the greater the proportion of time you intend to spend in highly technical terrain or climbing with two tools.

With a hybrid ice axe, emphasize smaller models over larger models. We do not recommend purchasing models larger than 60cm.

STAFF PICKS: Petzl Sum'tec, Black Diamond Venom

GENERAL MOUNTAINEERING CRAMPONS

For moderate mountaineering, we recommend modern steel 12-point crampons with anti-balling plates. These are attached to your boots for traction on slick snow and ice surfaces, and as a self-arrest aid in the event of a fall. Choose a model with two horizontal front points and anti-balling plates, which are slick plastic bases that prevent snow from sticking to the bottoms of your feet. Rigid single-piece crampons, which do not accept anti-balling plates, are not recommended.

There are many other styles of crampons, though most are better suited to other types of climbing. Ultralight aluminum crampons or 10-point crampons are best used for fast-and-light ascents. Crampons with vertical front-points are best suited to higher angle ice climbing, where snow travel is minimum. Mono-point crampons are designed for high-end ice or mixed climbing only.

Crampons can attach to your boots via straps or by a bale system. Straps attach to your boots in a straightforward way and are considered to be universal, even able to attach to boots lacking a fully-rigid sole. Bale attachments are typically lighter, lower in profile and even more precisely secure, but require that your boots feature a heel and/or a toe welt where the bale will attach. Alpine Ascents prefers a bale attachment in the rear, with a strap attachment in the front as the ideal blend.

When fitting your crampons, no part of the crampon should be loose, and the spreader bar connecting the front and rear sections of your crampon must be properly adjusted. Any extra “wiggle” will result in progressive loosening, and thus risk detachment. Note that some boot sizes will require a longer spreader bar than the stock spreader bar, but this will vary by manufacturer.

STAFF PICKS: Black Diamond Oz Carabiner, Black Diamond Hotwire Carabiner
**ALPINE CLIMBING HARNESS**

An alpine-style climbing harness is a lightweight, primarily webbing-based seat harness designed for attachment to a climbing rope. These harnesses are extremely light and packable, and are typically designed with fully-separating leg loops and waist belts—key features for putting on or taking off your harness in the alpine environment. Most models feature gear loops, which are important for alpine versatility, and belay loops. Models without a belay loop are typically older in design and less ideal. Most models are not padded, and thus are not designed for traditional rock climbing where longer “hangs” in the harness would be expected.

Fit your harness to allow for wearing with a variety of layers. Most importantly, your harness must offer sufficient size in the legs and waist to be put on over top of your outermost layer.

**STAFF PICKS:** Black Diamond Couloir, Mammut Zephir Altitude

**ROCK CLIMBING HARNESS**

A rock climbing harness is a padded, comfortable seat harness designed to safely attach you to the climbing rope whether you are climbing or belaying. A huge variety of models exist, with a variety of features and specifications. For big-wall climbers, heavier, more padded models with more gear loops are ideal. For high-end sport climbers, lighter and trimmer harnesses devoid of extra features are ideal. Other features might include a rear anchor loop, adjustable leg loops, chalk bag attachment point, ice clipper slots, dual belay loop, or extra gear loops. Choose your features based on your intended use.

As with an alpine climbing harness, your rock climbing harness should be designed to fit snugly over the top of the heaviest layers you intend to wear while wearing the harness.

**STAFF PICKS:** Black Diamond Xenos Harness, Petzl Sama Harness

**CLIMBING HELMET**

A climbing helmet is a unique style of helmet specifically designed for climbing. This style of helmet is highly ventilated, easily adjustable to accommodate changing headwear, has headlamp attachment points, and is durable yet lightweight. Ski/snowboard and bike helmets should not be used for climbing.

A variety of styles exist. The lightest helmets are constructed only of expanded foam—these helmets are not very durable, and are recommended only for fast-and-light pursuits. The heaviest helmets feature a hard shell with an interior harness. This older style is less ideal due to weight. [cont’d]
LIQUID FUEL STOVE

Used for cooking meals, and melting snow for water, liquid fuel stoves are the traditional stove style for expeditions around the globe. Liquid fuel (typically “white gas”) is stored in a steel bottle, which is then pressurized with a pump during stove use. Liquid fuel stoves operate more efficiently at a wider range of altitudes and temperatures than canister-fuelled stoves, but are heavier and slightly more complicated to use. [cont’d]

CLIMBING HELMET CONT’D

The most popular style of climbing helmets feature a lightweight, hardened polycarbonate shell with an expanded polystyrene foam liner. This combination of materials offers the best blend of light carrying weight, exceptional protection, and sufficient durability for the climbing environment. Fit your helmet to comfortably accommodate any hats you might wear while using your helmet, including a warm hat if you intend to climb in cooler climates.

STAFF PICKS: Black Diamond Vector, Black Diamond Half Dome
LIQUID FUEL STOVE CONT'D

On longer expeditions or trips where significant quantities of snow will be melted for water, liquid fuel stoves are preferred due to the space efficiency of the liquid fuel over canister fuel. Liquid fuel stoves should be kept clean of carbon buildup between uses, and it is always prudent to carry a complete stove repair kit when traveling with a liquid fuel stove. Liquid fuel stoves can be used with just about any cookware.

When traveling, be sure the proper kind of fuel is available at your destination. While some liquid fuel stoves can burn nearly any kind of fuel, like the MSR Whisperlite International, other liquid fuel stoves can only burn pure white gas, like the MSR Dragonfly.

STAFF PICKS: MSR Whisperlite, MSR XGK EX

COOK POT & COOKWARE

For backcountry cooking, a pot is key for both cooking meals and melting snow for drinking (where applicable). Backcountry pots should be lightweight, and made from either anodized aluminum, stainless steel, or titanium. Pots with a lid and handle (or accessory pot grips for models without a handle) are always preferred.

Anodized aluminum conducts heat evenly, is lighter than stainless steel, and sticks to food less- although it can be easily dented and scratched. Stainless steel is heavier and can heat unevenly (causing scorching), but it does not scratch and is extremely durable. Titanium is the lightest of the three materials and is extremely durable, although it does cost more.

One exception to traditional all-metal pots is now available: the Sea to Summit X-Pot. It is a composite metal/plastic pot that can be collapsed in accordion fashion. While this pot requires some extra care so as not to collapse it unexpectedly, it is extremely light and convenient for packing, as well as easy to clean.

Cooking pots are available in a variety of sizes- smaller pots (1-3 liters) are more suitable for solo or small-group cooking, whereas larger pots (6-10 liters) are critical for larger groups or when melting significant quantities of snow for water.

For gourmet cooking, you may elect to use a frying pan. This allows for frying eggs, toasting bread, or other more complicated cooking that is challenging to accomplish in a cooking pot. Most choose to bring a small camping spatula if using a frying pan.

STAFF PICKS: MSR Quick 2 Pot Set, Sea to Summit X-Pot
**CANISTER STOVE**

Newer canister-fuelled stoves, like the ever-popular Jetboil or MSR Pocket Rocket, represent the simplest and lightest backcountry stove option. These stoves screw onto a canister or cartridge containing a blend of isobutane fuel, and are typically very easy to light and use.

Standard stoves, like the MSR Pocket Rocket, can be used with nearly any cookware; however, these single-burner stoves are very inefficient in windy environments, and are best left to very calm, warm-weather camping or backpacking below the treeline.

High-efficiency all-in-one systems, like the MSR Windburner, are growing increasingly popular for backcountry use. These systems require model-specific cook pots which “mate” to the stove burner, offering a sharp increase in the efficiency of thermal transfer and a sharp increase in wind resistance. Thus, efficiency is gained at the expense of flexibility. For the most part, single-pot or boiled water meals are the only options when using a system stove.

When using a canister stove, keep in mind that higher altitudes and lower temperatures decrease the pressure in the fuel canister, resulting in decreased efficiency. In really cold conditions, it can be necessary to physically warm the canister with your hands to get sufficient output to your stove.

**STAFF PICKS:** MSR Windboiler, Jetboil Mini-Mo, MSR Pocket Rocket

**STOVE REPAIR KIT**

For any liquid-fuelled stove, a repair kit is key. If parts are utilized, be sure to replace them prior to your next expedition. Don't forget a lighter to light your stove!

**STAFF PICK:** MSR Expedition Service Kit

**FUEL BOTTLE**

For liquid fuel stoves, a fuel bottle is required. These are made of steel, with a spill-proof lid, and can be attached to a stove with the stove’s pump. Fuel bottles are refillable, and are available in a wide range of sizes to best suit the duration of a trip. Note that airport security will confiscate any fuel bottle that hasn’t been diligently cleaned of all fuel residue and odor!

**STAFF PICK:** MSR Fuel Bottle
**BOWL**

For any backcountry travel, a lightweight plastic bowl is key for cooking and eating. A vast variety of styles are available, from fully rigid bowls to collapsible bowls to newer flat-folding origami-style bowls. Bowls are available in many sizes to suit specific needs.

**STAFF PICKS:** Sea to Summit X-Bowl, Fozzils Bowlz, MSR Deep Dish Plate

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**CUP/MUG**

For any mountain travel or backpacking, a quality, insulated mug with lid is key! This item allows safe consumption of hot beverages or small servings of soup. Non-insulated, “traditional” steel cups are strongly cautioned against—the immediate heat conductivity of these styles decrease the time liquids are kept hot and risk burning hands. Modern double-walled, lightweight mugs are barely noticeable in a pack, offer ergonomic shapes and textured grips, and can keep liquids hot for surprisingly long periods of time.

**STAFF PICKS:** Sea to Summit Delta Mug, MSR Stainless Steel Insulated Mug

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**DROMEDARY**

A lightweight, flexible water reservoir. These are highly useful in situations where a water source is not located near camp, or when early morning “alpine starts” make it necessary to melt water the night before. These are puncture-resistant (fabric-backed models work best) and have a wide-mouth opening at the top. These reservoirs do not replace water bottles, but are used in conjunction for storing liquid water in camp.

MSR’s designs are the best available today, with abrasion-resistant outers that are light enough not to weigh your pack down significantly.

**STAFF PICKS:** MSR DromLite, MSR Dromedary

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**KNIFE**

For climbing & mountaineering applications, knives should be simple, small, and lightweight. Very trim multi-tool knives can be nice on longer expeditions where the ability to repair a broader range of equipment is desirable. For shorter climbing trips, simple blade-only models are preferable.

**STAFF PICKS:** Petzl Spatha, Gerber Obsidian
**SPOON / SPORK**

Lightweight polycarbonate or titanium utensils work well. Some prefer “spork” versions with small fork tines, while a spoon-style utensil is sufficient for others. A variety of styles are available and offer different and sometimes competing benefits. Long-handled models allow reach into deep bowls or freeze-dried meal bags. Titanium or other metal models get colder in colder environments, which some find to be uncomfortable. However, metal models are significantly more durable than plastic models. Folding polycarbonate models are exceptionally light and compact, but do not offer the same durability and reach as metal.

**STAFF PICKS:** Sea to Summit Alpha Light Long Spoon, MSR Spoon V2

**SPORTS DRINK MIX**

Powder or tablet-style electrolyte drink mix is recommended for maintaining a proper balance of sodium and electrolytes when exercising or sweating heavily. Staying well-hydrated requires more than merely water intake- consuming water only while exercising aggressively over a long period of time can deplete key vitamins and minerals from your system- literally “watering down” the mineral balance of your body. This depletion will cause a decrease in your performance, and can cause cramps and other side effects. Providing your body with a surplus of sodium, potassium, and magnesium (to name a few) will not only help you perform in the moment, will help your body recover better upon reaching camp.

While a variety of powdered and tablet-style mixes exist, Alpine Ascents prefers the nutritional balance present in Skratch Labs products. Regardless of what you use, be sure to test the flavor before beginning a trip or expedition!

**STAFF PICK:** Skratch Labs Exercise Hydration Mix

**WATER BOTTLE**

For any outdoor pursuit, nothing beats the classic 1-liter, wide-mouth Nalgene bottle. Nalgenes are extremely durable, and can provide many years of reusable water carrying. Nalgenes are produced without BPA, so no harmful chemicals leech into your liquids.

Narrow-mouth bottles are not recommended, as they are both more challenging to fill and more likely to freeze shut in cold conditions.

**STAFF PICK:** AAI Logo Nalgene
WATER BOTTLE PARKA

Insulated carriers for your water bottles designed to completely enclose the water bottle, for protection against the extreme cold found at higher altitudes or in polar regions. Models with a zippered opening offer more robust insulation, whereas velcro closure neoprene models offer less insulation at a reduced weight and bulk penalty.

STAFF PICKS: OR Water Bottle Parka, Forty Below Deluxe Bottle Boot

THERMOS

Lightweight vacuum-insulated stainless steel models are best. Large-mouthed models between .5-1L in capacity seem to work best- and make sure the lid is leak-proof! Thermoses, while a nicety at lower altitudes and in warmer climates, provide critical warmth and hydration at higher altitudes and in colder conditions.

A small drink of hot, sugary tea has jump-started successful summit attempts across the world. In fact, Denali National Park mandates that all climbing parties carry a thermos during any summit attempt.

STAFF PICK: Hydroflask 20oz. Coffee Flask
**DRUG KIT**

A personal kit of the medications (both prescription and over-the-counter) you take on a regular basis as well as basic over-the-counter medications such as ibuprofen, Excedrin, etc.

For international and high-altitude travel, other prescription medications may be required. Consult a physician or with a reputable source to determine what other drugs may be useful to you. In addition, we recommend carefully exploring contraindicating circumstances related to your specific climb or trek. For example, altitude does not mix well with Ambien, and anti-malarials have a wide range of side-effects.

**SMALL FIRST AID KIT**

Lightweight vacuum-insulated stainless steel models are best. Large-mouthed models between .5-1L in capacity seem to work best. Make sure the lid is leak-proof! Thermoses, while a nicety at lower altitudes and in warmer climates, provide critical warmth and hydration at higher altitudes and in colder conditions.

A small drink of hot, sugary tea has jump-started successful summit attempts across the world. In fact, Denali National Park mandates that all climbing parties carry a thermos during any summit attempt.

**STAFF PICK: Adventure Medical Kits Ultralight .5 First-Aid Kit**

**BLISTER PREVENTION & TREATMENT**

Moleskin: An adhesive pad with a soft pile made of heavy cotton fabric used to treat hot spots. Catching and treating hot spots early on can prevent blisters from forming.

Mole foam: Like moleskin, but used in “U” or donut shaped pieces and placed around a blister to provide relief from pressure or rubbing against a blister.

Athletic Tape: Used to adhere bandages or treatments (molefoam), but also for preventative taping in known problem spots.

Triple Antibiotic Cream: A topical antimicrobial cream used to cover cuts, scrapes, and open blisters to prevent problematic infections from developing and speed up healing.
**EAR PLUGS**

Inexpensive, disposable foam ear plugs are often overlooked when packing for a trip, and sometimes to disastrous ends! Whether your tent-mate snores or the winds are howling, inexpensive foam ear plugs will allow you to sleep soundly.

**STAFF PICK:** Mack's Soft Foam Earplug

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**HAND SANITIZER**

A key item to keep hands sanitary for eating and cooking, hand sanitizer needs to be alcohol based, containing at least 60% alcohol. A small bottle with a flip lock lid is recommended. This will be used after using the bathroom, or before preparing/handling food. Illness due to dirty hands can have a strong negative impact during a backcountry trip.

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**INSECT REPELLENT**

A small, plastic, leak-proof bottle is recommend for when the bugs are bad in your planned climbing or hiking destination. 100% DEET varieties are the most effective, though they can be irritating to sensitive skin and can eat through technical garments. Lower concentration mixes (30-40% DEET) work well but require more frequent reapplication to be effective. Insect repellent is only necessary when bugs are problematic, so seek guidance before traveling.

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**LIP BALM**

For sunny or dry climates, lip balm is a must to prevent chapped, cracked, or sunburnt lips. Mountain-ready lip balm needs to have UVA/B protection with an SPF rating of at least 15.

**STAFF PICK:** Aloe Gator Medicated Lip Balm SPF 30

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**TOILETRIES**

Bring basic personal toiletries, including a toothbrush, toothpaste, and floss. We recommend leaving behind items like deodorant and makeup. On longer trips, items like wet wipes can be nice for extra cleanliness.
PEE BOTTLE

Used in the tent at night when it is cold and you don't want to head out to use the bathroom, a pee bottle is a climber's best friend, especially in extremely cold temperatures or during storms. After nighttime use, the bottle is dumped out at a designated location. Experienced climbers recommend allotting sufficient space for two nighttime uses, so carefully consider what capacity you will require.

Bottles can either be a 1-liter wide-mouth plastic bottle or a plastic collapsible canteen. Alternatively, an empty Gatorade bottle can suffice, but this is only recommended for shorter trips due to durability. Be sure to mark the bottle clearly!

**STAFF PICK:** Nalgene Cantene

PEE FUNNEL (FOR WOMEN ONLY)

Used to pee discreetly in the field, or to utilize a pee bottle in a tent. These are lightweight urinary directors, and are loved by female guides and users. They allow a minimum of exposure while urinating, but require some practice to utilize.

**STAFF PICK:** Sani-Fem Sport & Travel Freshette

TOILET PAPER

High on the list of items to remember when heading into the backcountry, toilet paper is key to cleanliness and comfort in the mountains. Bring an amount (plus some extra) appropriate to the length of your trip. Remove the amount needed from a roll, and store it in a waterproof bag (a Ziploc works well!).

**STAFF PICK:** Bio-Wipe Toilet Paper

SUNSCREEN

Sunscreen is necessary all the time in the mountains, and becomes increasingly critical with each foot of elevation gained. Your sunscreen should have UVA/B protection with a minimum of 30 SPF rating.

Grease-free, sweat-resistant blends are strongly preferred for effectiveness on longer trips requiring exertion. For extra protection, climbers often turn to blends containing Zinc Oxide, which is exceptionally effective at providing sun protection to the skin. [cont’d]
SUNSCREEN CONT'D

It is often helpful to have several small tubes of sunscreen while climbing, for storing in several convenient locations. Also note that the SPF rating of sunscreen decreases as the age of the sunscreen increases—especially for trips to high altitudes, we recommend purchasing new sunscreen so as to avoid a very surprising sunburn.

STAFF PICK: Dermatone Z-cote

WATER TREATMENT

Iodine or Chlorine dioxide tablets will do the trick to purify your water. A small bottle or pack will be sufficient. Taste-neutralizing tablets will remove the iodine taste, and chloride dioxide formulas will not discolor your water. Modern UV pen devices also work well but require battery power.

Perhaps the best available chemical water treatment is Aquamira. Favored by climbers & outdoorsmen across the world, it is a chlorine-dioxide formula that leaves water tasteless, and neutralizes all of the bugs contained in backcountry water sources.

STAFF PICKS: Steri-Pen Adventurer Opti, Aquamira Water Treatment Drops
**SHORT SLEEVE BASELAYER SHIRT**

Lightweight crew-neck t-shirt that wicks away moisture, to be used in warm conditions. Many fabrics are suitable, from lightweight merino wool to full-synthetic models. Full-synthetic will wick moisture and dry more quickly, but are typically less durable and absorb underarm smells more quickly. As a short-sleeved baselayer shirt will be used in warm conditions, white or lighter-colored models are better so as to absorb less sunlight.

**STAFF PICKS:** Arc’teryx Phase SL Crew, Rab Merino+120 S/S Tee

**LONG SLEEVE BASELAYER SHIRT**

Worn against the skin but beneath an outer layer (like a softshell jacket), baselayer tops are also known as “long johns”, “long underwear tops”, or frequently called by a popular brand name- Under Armor. Baselayer tops are made of either wool or synthetic materials (not cotton!), and are generally designed to be close-fitting for comfort beneath other layers.

For mountaineering, lightweight models are preferred to heavier models, as they are significantly more versatile for a range of conditions. Some prefer wool or wool-blend models, as wool’s natural anti-microbial properties stave off unpleasant smells better. However, synthetic models are often more breathable and cheaper. Crew-neck models are simple, but zip-neck models can be ideal for venting heat. Consider light-colored models, too- in bright sunlight, they will absorb less heat. A snug, contoured fit is important as it helps reduce bulk and allows full range of motion.

**STAFF PICK:** Rab Merino+ 120 Crew

**MIDLAYER TOP**

Designed to be worn as a baselayer in cold conditions or over your light baselayer shirt in very cold conditions, midlayer tops have a lightweight and breathable fleece-like weave which is moisture-wicking. Note that true pile fleece jackets are not considered a midlayer, as they are not breathable nor usually trim-fitting.

Flat-style fabrics, like Polartec Power Stretch, can work well. Alternatively, very light purpose-built gridded fleece, like Polartec Powergrid or Patagonia’s R1 fabric, can work very well. A snug, contoured fit is important as it helps reduce bulk and allows full range of motion.

**STAFF PICK:** Rab Baseline Jacket, Rab paradox Pull-on, Patagonia R1 Hoody
**SOFTSHELL JACKET**

The next layer donned after a baselayer and/or a midlayer, the softshell jacket is a stretchy, wind-resistant or windproof breathable layer constructed of woven or knit polyester & nylon. Softshell jackets are designed to protect against light precipitation and wind.

Softshell fabric gained popularity in the early 2000’s, and was a critical paradigm shift in layering. Effectively, softshells allow you to avoid donning a hardshell (waterproof) jacket until absolutely necessary, ensuring that your body is drier and more comfortable than inside a moisture-trapping hardshell. Furthermore, softshell fabric allows for greater freedom of movement, typically offering similar stretch to a baselayer. Softshell is preferred over fleece as it is less bulky, sheds moisture better, and has a more dynamic temperature comfort range. Unlike fleece, to which snow and moisture stick, softshell fabric has a harder (smoother) face.

A variety of softshell jacket fabrics and designs exist; the warmest kind feature Gore-tex Windstopper outer fabric and a gridded fleece interior, while the lightest kind are typically a single layer of very stretchy, wind-resistant and highly breathable nylon. Choose a model that best fits you: “hot” climbers should pick lighter models, while “cold” climbers should choose thicker models.

This will usually be your primary outer layer while on the mountain, and should be sized to fit over a baselayer or a baselayer and midlayer.

**STAFF PICKS:** Outdoor Research Ferrosi Hoody, Rab Exodus Jacket

**HARDSHELL JACKET**

A hardshell jacket, also known as a rain jacket, Gore-tex jacket, or waterproof jacket primarily provides protection against rain or snow, and secondarily provides protection from wind. Hardshell jacket fabric must be waterproof/breathable (such as Gore-Tex, eVent, or Pertex).

Hardshell jackets are available in a variety of fabric weights and with a variety of waterproofing technologies. Generally, lighter 2 to 2.5-layer jackets are more suitable to shorter or drier trips. Heavier 3-layer jackets tend to be “more waterproof” in extended use in wetter or more adverse conditions. Though not always true, a more expensive hardshell jacket will offer greater durability and weather protection than a less expensive hardshell jacket.

For mountain travel, hardshell jackets MUST have a hood and MUST be uninsulated. Dual-purpose, insulated hardshell jackets do not allow for modular layering. [cont’d]
**HARDSHELL JACKET CONT'D**

For any trips requiring the use of a climbing helmet, you must ensure helmet compatibility- not all hardshell jackets are designed with a tall enough hood for a helmet. Underarm zippers to regulate ventilation can be helpful to prevent overheating in warm conditions, but are not required. Generally speaking, a hardshell jacket should never be worn unless extreme wind or precipitation requires it- it is better to use more breathable layers (like a midlayer or softshell jacket) when possible to avoid trapping sweat.

Hardshell jackets are worn, potentially, over all layers excluding insulated jackets. Depending on your intended use, you may need to size your jacket up to accommodate your baselayer, midlayer, and softshell jacket. However, potential is ever-present to wear your hardshell jacket over only a baselayer in warm but wet conditions.

**STAFF PICKS:** Rab Muztag Jacket, Arc’teryx Alpha SV Jacket

**INSULATED SYNTHETIC JACKET**

Synthetic insulations (tangles of various poly-fibers like Primaloft, Polartec Alpha, and CoreLoft) mimic down’s insulative, air-trapping properties, but are not susceptible to a loss of loft in damp conditions like goose down. Thus, insulated synthetic jackets are especially desirable in “middle” conditions, where the weather is cold enough to require insulation but warm enough to ensure wet or damp conditions. Models with a hood are significantly more versatile than hoodless models.

An insulated synthetic jacket can be a key piece for summer mountaineering- especially in wet locations like the Cascades. Alternatively, many climbers use light insulated synthetic jackets as layering pieces on colder or higher-altitude trips, as the synthetic insulation handles body moisture without any problem and dries quickly.

Synthetic insulations are typically measured in grams of weight per square meter- this number helps indicate how warm a jacket will be. A 60g insulated jacket is ideal as an insulator on a windy but sunny day on the summit of Mount Baker, whereas a 180g insulated synthetic jacket would be warm enough for climbing as high as 5000m.

Increasingly, highly technical insulations like Polartec Alpha and Patagonia’s FullRange are offering jackets with a much greater dynamic comfort range. These insulations trap warm air well when necessary, but dump heat and moisture well when you begin to overheat. Examples are the Rab Alpha Direct and the Patagonia Nano Air.

**STAFF PICKS:** Rab Nimbus Jacket, Rab Xenon X Jacket
**INSULATED DOWN JACKET**

Lighter than an expedition parka but still designed to offer significant insulation, an insulated down jacket is a mid-sized down-insulated jacket designed for use in cold conditions or at moderate altitudes. These are worn during breaks, around camp, and when climbing in cold conditions. Down jackets must have a insulated hood—hoodless models are not typically warm enough for true mountain uses.

For climbs like Mount Elbrus, Mount Rainier, or Chimborazo, jackets weighing approximately 2-4 lbs., and stuffed with approximately 225g of 700-850 fill-power down are suitable. Ascertaining exactly how warm a down jacket is can be challenging; myriad factors such as down quality, construction method, and fabric choices can greatly impact the warmth of a jacket. We strongly recommend contacting an expert resource when choosing a down jacket. Note that advertisers and salespeople often do not possess the knowledge necessary to recommend an appropriate jacket for alpine climbing!

In lieu of a down insulated jacket, certain synthetic insulated jackets can suffice. Models like the Patagonia DAS Parka have a storied history. While synthetic insulation offers a shorter lifetime and is less warm and packable by weight than down, some may prefer the water-resistance of synthetic insulation.

The fit of a down jacket is typically less trim-fitting and slightly oversized as compared to a shell or soft shell jacket, so generally if you are a large in other items then a large parka will fit.

**STAFF PICKS:** Rab Neutrino Endurance Jacket, Feathered Friends Volant Jacket

**EXPEDITION PARKA**

An expedition parka, also called an 8000m parka, represents the warmest insulated jacket available and is suitable for use anywhere that extreme cold is a certainty or possibility. As with down pants, expedition parkas are down-insulated rather than synthetic insulated - the quantity of synthetic insulation required to render a jacket suitable for 8000m use would be too heavy and too bulky. Note that features such as a longer cut (the hem is below the hip), an insulated hood, baffle box construction, and 800+ fill-power down help to mark out a jacket as expedition-worthy.

On 6000m climbs like Denali and Aconcagua, the expedition parka is typically used sparingly, when temperatures experienced while relaxing at high camp or climbing on summit day require it. However, despite less use, expedition parkas are key to safe travel in these storm-prone areas. [cont'd]
EXPEDITION PARKA CONT'D

On 8000m climbs like Cho Oyu or Mount Everest, or during polar exploration, the expedition parka may be used frequently, but this depends on weather conditions.

A down parka should fit slightly oversized compared to a shell or soft shell jacket, as it is designed to fit over these layers. Generally, you will wear the same size expedition parka as you would a shell or softshell. However, manufacturer’s designs vary so it is best to try on the clothing you will be wearing while climbing.

**STAFF PICK:** Rab Expedition Jacket (AAI is proud to be the only US-based distributor)

BASELAYER PANTS

Worn against the skin but beneath an outer layer (like softshell pants), baselayer bottoms are also known as “long johns” or “tights”. Baselayer bottoms are made of either wool or synthetic materials (not cotton!), and are generally designed to be close-fitting for comfort beneath other layers.

For mountaineering, lightweight models are preferred to heavier models, as they are significantly more versatile for a range of conditions. Some prefer wool or wool-blend models, as wool’s natural anti-microbial properties stave off unpleasant smells better. However, synthetic models are often more breathable and cheaper.

A snug, contoured fit is important as it helps reduce bulk and allows full range of motion. Boot-cut fits are also acceptable when used for climbs where tall boots are always worn.

**STAFF PICK:** Rab Merino+ 120 Pant

MIDLAYER BOTTOM

Designed to be worn as baselayer pants in cold conditions or over your light baselayer pants in very cold conditions, midlayer pants have a lightweight and breathable fleece-like weave which is moisture-wicking. Note that true pile fleece pants are not considered midlayer pants, as they are not breathable nor usually trim-fitting.

Flat-style fabrics, like Polartec Power Stretch, can work well. Alternatively, very light purpose-built gridded fleece, like Polartec Powergrid or Patagonia’s R1 fabric, can work very well. A snug, contoured fit is important as it helps reduce bulk and allows full range of motion.

**STAFF PICK:** Rab PS pants
**CLIMBING PANTS**

Thin, comfortable pants designed for dry rock climbing with a gusseted crotch for flexibility. The pant should be lightweight, breathable and allow for a wide range of motion. Many fabric choices are available. Light softshell pants can work well, but cotton pants or safari-style pants are even better for very warm conditions. Zippered pockets can also be nice; beware of using open pockets while rock climbing!

When fitting climbing pants, consider how the waist closure will feel beneath a harness.

*STAFF PICK:* Rab Vertex Pants

**SOFTSHELL PANTS**

Weather resistant, air-permeable, stretchy, and durable- softshell pants are the primary pants worn by mountaineers and cool-weather trekkers. These can be combined with a baselayer for increased warmth, or a hardshell layer when precipitation moves in.

Keep in mind that thicker softshell fabric or softshells listed as waterproof are less versatile for warmer conditions, and should generally be avoided. See “Softshell Jacket” for general information regarding softshell garments, including information on fabrics.

*STAFF PICKS:* Rab Vector Pants, Arc’teryx Gamma AR Pants

**HARDSHELL PANTS**

Hardshell pants are designed to protect you from rain, snow and/or wind, and are worn as the outermost layer (except when using Insulated or Down Pants). For mountaineering, hardshell pants must offer full-length side zippers; this allows for layering in changing conditions without removing any footwear such as boots and/or crampons. Pants with 7/8th zippers (zipper stops short of the hip) are sufficient, but are not as easy to take on and off if you are wearing mountaineering boots. For trekking or backpacking, shorter side zippers can suffice.

Regardless of your intended use, hardshell pants should be uninsulated to allow for modular layer. A light nylon or nylon mesh lining is OK, but adds weight and usually indicates an older model. You should be able to comfortably wear your hardshell pants over either just baselayer bottoms, or potentially over your baselayer bottoms and softshell pants. See “Hardshell Jacket” for general information regarding hardshell garments, including information on fabrics.

*STAFF PICKS:* Rab Latok Alpine Pants, Arc’teryx Alpha SL Pants
**INSULATED SYNTHETIC PANTS**

Synthetic insulated pants which provide excellent warmth-to-weight ratio, compress easily, and insulate even when damp or wet. These pants are key to keeping your legs sufficiently warm in cold or windy conditions in the mountains, and are used when basic layering isn’t sufficient, but expedition down pants would be unnecessarily warm.

For mountaineering, insulated synthetic pants must have full side zippers which allow for temperature regulation and easy on/off while wearing boots. Note that insulated ski pants do not serve the same purpose—these pants are light & packable, but also very warm. Most ski pants do not offer full size zippers, are heavy, or are designed with a waterproof shell, rendering the pants non-breathable.

For fit, be sure you can wear your other pant layers underneath this pant. Unfortunately, please note that no manufacturer is currently offering a women’s specific model of insulated synthetic pant.

*STAFF PICK:* Rab Photon Pants

**DOWN PANTS**

Also called 8000-meter pants, these pants are designed for use on the world’s highest peaks such as Cho Oyu or Mount Everest. Due to the need for such a high level of insulation, these pants are not available with synthetic insulation—only down insulated pants provide a sufficient warmth-to-weight ratio. A quality pair of down pants can be used in combination with an 8000-meter parka to make a modular down suit.

Key features include full side zips for entry/exit and using the bathroom, reinforced high-wear areas like the seat and knees, fully baffled construction for warmth, and suspenders or a “salopette” style build for keeping the pants up.

Pants should be sized to accommodate wearing all other layers at the same time, however, manufacturers often account for this. Typically, there is no need to “size up”.

*STAFF PICKS:* Rab Expedition Salopettes, Feathered Friends 40 Below Pants
ABOUT BACKPACKS

A backpack is used to carry your gear, and is one of the most important items to own and practice using. Note that this guide will not refer to external-frame backpacks, which feature an exterior metal frame and low internal carrying capacity—this is because external frame backs are not recommended for backpacking, trekking, nor especially for climbing. Thus, all comments here refer to only internal-frame backpacks in which padding, metal stays, or rigid materials are used to give a backpack shape, and which are designed to carry all loads internally rather than strapped to the outside.

MAKING A SELECTION

A vast range of backpacks are available today with a variety of features, volumes, and intended uses. There are a few key things to consider as you select a pack:

1. What features will I need?

A range of features are available, but pick a backpack with features specifically designed for your intended use. A backpacking pack will feature many pockets, access points, and often a very heavy or cushioned suspension. It is ideal for moderate terrain. A climbing pack will feature a trim suspension, typically top-only access, ice-axe & crampon attachment points, and lightweight fabrics. It is ideal for climbing mountains or technical routes. Each is ideal for the intended
use, though in many (but not all!) cases a climbing pack can be used for backpacking, and a backpacking pack can be used for climbing.

2. What size backpack do I need?

Backpacks are measured in “liters of capacity”, although some manufacturers list backpack capacity in cubic inches (1 liter = 61 cubic inches). A “town” backpack will be 15-25 liters; a weekend-ready backpack 45-55 liters; a pack designed for 3+ days will be even larger, with the largest packs measuring 105 liters. Refer to an expert or packing list when choosing a pack size, and practice packing your gear before heading into the field.

3. How do I fit my backpack?

Backpacks are fitted to your torso size. Thus, height alone is not a sufficient measurement to fit a backpack. 6’0” climbers may wear a small or extra large frame size! So, you must measure the distance between the top of your iliac crest (hip bones) and the uppermost spinal bone where the slope of your shoulders meets your neck. Compare this measurement to the manufacturer’s specifications, and always weight and then try on your backpack.

Once your backpack is on, first seat the hipbelt on or above your iliac crest (based on personal preference), and cinch it down. Then, pull each shoulder strap into a comfortably snug and even position. Next, adjust the “load lifters” (when relevant) running from the top of the shoulders to the backpack. Finally, locate any other adjustment points—such as behind the hips—and ensure all straps have a small amount of tension on them. Each individual is different. Seek expert assistance in fitting your pack, or spend time making different adjustments until you are comfortable.

Note: Backpack covers are to be avoided in the mountain environment due to high winds.

**BACKPACK RECOMMENDATIONS:**

30-35 Liter Packs (Single-Day Use)

**STAFF PICKS:** Arcteryx Alpha FL 30, Black Diamond Speed 30

35-50 Liter Packs (1-2 Days Use)

**STAFF PICKS:** Black Diamond Speed 40, Osprey Exos 38

50-65 Liter Packs (2-5 Days or Ultralight Expedition Use)

**STAFF PICK:** Black Diamond Mission 50

70-105 Liter Packs (5+ Days or Expedition Use)

**STAFF PICKS:** Osprey Xenith 105 or Xena 85, Mountain Hardwear BMG 105
CLOSED CELL FOAM PAD

Used beneath an inflatable sleeping pad, your foam pad should be a light piece of closed-cell foam (cut from a roll) or a factory-made foam sleeping pad designed to be used for outdoor activities. Pad should be roughly shoulder width, and can be full or ¾-body length.

A foam pad is primarily used to provide extra insulation when sleeping on snow, glaciers, or frozen ground. Secondarily, a foam pad provides versatile comfort around camp as a seat on rough ground or on snow benches. Lastly, on longer trips, foam pads provide an insurance policy should your inflatable mat develop a leak that cannot be repaired.

Many models are available; models with eggshell patterns trap more warm air, but can also collect spindrift which subsequently melts. Roll-up models are versatile, but accordion fold models can be easier to pack.

**STAFF PICKS:** Thermarest Z-Lite SOL, Thermarest RidgeRest

INFLATABLE SLEEPING PAD

Commonly referred to as a “Therm-a-Rest” due to the popularity of that brand’s pads, an inflatable sleeping pad is used to provide cushioning and insulation when sleeping on the ground. Most pads are inflated using lung power and a valve which can be opened or closed. Self-inflating models are typically bulkier and heavier. Due to technological innovations, lightweight and low-volume pads are available in a wide variety, including square or tapered models. Pads should be fitted to height—only use an extra-long pad if your height requires it.

Always have repair items in case of a leak (especially on longer trips) including: a valve repair kit and multiple one-step adhesive patches.

**STAFF PICK:** Thermarest Neoair XLite

COMPASS

For backcountry use, a compass is a handheld navigational tool that points to the Earth’s magnetic north pole, allowing for positioning in association with physical observations and a map. A compass does not utilize batteries nor depends on Global Positioning satellites, thus, compass navigation is a key backcountry skill.

A compass should have a sighting mirror and a declination adjustment. The sighting mirror helps to improve the accuracy of your readings. Other features that are good to have are a magnifying glass on base plate, luminescent markings, and a clinometer (measures slope angle). Note that compasses will only work properly in their intended hemisphere, so utilize a Northern Hemisphere compass in Washington, and a Southern Hemisphere compass in Argentina.
**COMPRESSION STUFF SACK**

Used to decrease the storage volume of a sleeping bag or other heavy down insulation, a compression stuff sack is a lightweight nylon bag with ratcheting straps, and may be waterproof or simply provide storage. Especially for longer trips or for sleeping bags rated to -20°F or greater, compression stuff sacks are key.

Note that compression stuff sacks and stuff sacks in general are NOT necessary for all of your clothing or food items.

**STAFF PICK:** Sea to Summit eVent Compression Drysack

**SLEEPING BAG: 20 DEGREE**

At a 20°F rating, a sleeping bag must have a full side zipper, hood, and head cinch cord. While either a down-insulated or synthetic-insulated bag may be chosen, keep in mind that down insulation has a longer lifespan, and is both lighter and more compressible than synthetic insulation. However, at this rating, synthetic bags are sometimes preferred due to the likelihood of encountering rain during usage. Choose a mummy-cut model for weight and space savings, as well as for thermal efficiency. Taller users may need an extra-long version.

Generally speaking, a 20°F bag is suitable for use in warm conditions in the Cascades or at lower elevations worldwide.

**STAFF PICKS:** Rab Neutrino 600, Marmot Helium

**SLEEPING BAG: 0 DEGREE**

At a 0°F rating, a sleeping bag must have a full side zipper, hood, and head cinch cord. While either a down-insulated or synthetic-insulated bag may be chosen, keep in mind that down insulation has a longer lifespan, and is both lighter and more compressible than synthetic insulation. Choose a mummy-cut model for weight and space savings, as well as for thermal efficiency. Taller users may need an extra-long version.

Generally speaking, a 0°F bag is suitable for use on Mount Rainier, in the Lower Alaska Range, and on most moderate volcanoes (such as Chimborazo).

**STAFF PICKS:** Rab Neutrino 800, Feathered Friends Snowbunting EX 0
**SLEEPING BAG: -20 DEGREE**

At a -20°F rating, a sleeping bag must have a full side zipper, hood, draft collar, zipper draft tube, and head cinch cord. Only a down-insulated bag should be chosen, as synthetic insulation is too bulky and heavy in the quantities required to meet this temperature rating. Choose a mummy-cut model for weight and space savings, as well as for thermal efficiency. Taller users may need an extra-long version.

While “shelled” sleeping bags exist at this rating, keep in mind that any exterior waterproof shell will trap air inside the bag as you attempt to pack it, and trap body moisture inside the bag. Shelled models are only highly relevant in extreme bivy situations, where sleeping completely exposed to the elements or in a single-walled tent is likely.

Generally speaking, a -20°F bag is suitable for use up to about 6000m, and is ideal for use on peaks like Denali and Aconcagua.

**STAFF PICKS:** Rab Expedition 1000, Feathered Friends Ptarmigan EX

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**SLEEPING BAG: -40 DEGREE**

At a -40°F rating, a sleeping bag must have a full side zipper, hood, draft collar, zipper draft tube, and head cinch cord. Only a down-insulated bag should be chosen, as synthetic insulation is too bulky and heavy in the quantities required to meet this temperature rating. Choose a mummy-cut model for weight and space savings, as well as for thermal efficiency. Taller users may need an extra-long version.

While “shelled” sleeping bags exist at this rating, keep in mind that any exterior waterproof shell will trap air inside the bag as you attempt to pack it, and trap body moisture inside the bag. Shelled models are only highly relevant in extreme bivy situations, where sleeping completely exposed to the elements or in a single-walled tent is likely.

Generally speaking, a -40°F bag is suitable for use up to 8000m, and for polar exploration. Very few warmer models exist, and are only necessary for winter Himalayan exploration or winter polar exploration.

**STAFF PICKS:** Rab Expedition 1400, Feathered Friends Snow Goose EX
**TENT: MOUNTAINEERING OR 4-SEASON**

For mountain climbing, a high-quality double-walled tent is necessary, selected with a number of occupants in mind—although it is worth considering that each climber's gear, especially on an expedition, represents nearly a half-person worth of space occupied.

In high winds, dome or tunnel-style tents work well. Single-pole shelters are not as strong in higher winds or snow-loading events. Likewise, single-walled tents are strongly cautioned against without significant experience and training for any travel to high altitudes or in stormy mountain conditions.

Tent should have guylines attached to the fly to hold the tent in high winds. If you have questions about guying out your tent please consult your manufacturer’s information.

**STAFF PICKS:** North Face VE25, Hilleberg Jannu, MSR Access 3

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**TREKKING POLES**

Collapsible three section poles are recommend. They are used for balancing when traveling over uneven terrain. Click lock style poles tend to hold up longer over time than twist locks.

**TREKKING POLES WITH SNOW BASKETS**

Collapsible three section poles are recommended. Poles are used for balancing when traveling over snow and uneven terrain. Click lock style poles tend to hold up longer over time than twist locks. Poles should have large baskets at bottom to keep poles from sinking deep into the snow.

**TRASH COMPACTOR BAGS**

Durable plastic garbage bags provide an inexpensive but effective way to keep your gear dry within your backpack. Compactor style bags are more durable than traditional garbage bags. 18-25 gallon bags work well as backpack liners, which you can simply drop open into your backpack and then begin packing. Carrying extra trash compactor bags is ideal on longer trips.

**WATERPROOF DRYBAG**

Referred to most commonly as a “Boundary Bag”, and loved by porters worldwide, the waterproof dry bag is generally a thick waterproof bag with backpack straps and roll-top closure for easy carriage in any environment. On Kilimanjaro, these bags are critical for keeping personal gear dry during travel, and while bags sit outside before tents have been erected for the night, 100+ liter models are ideal.
Climbers are indeed modern-day explorers with particular dreams and visions. We look to carry the rhythm of exploration by highlighting not only our climbs, treks and courses, but the overall experience of these journeys. Whether attending our mountaineering school, trekking in the Himalayas or attempting an 8000m peak, we treat each expedition as a unique exploration. We realize that every team member is an adventurer in his or her own right, and joins us to embrace a challenge and to learn through experience. We encourage you to visit our website to gather additional information about each expedition.

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