Introduction to Backpacking

Lightweight and Ultralight Backpacking



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Why Go Backpacking?

When I first became a Scoutmaster, my family and I lived in New Orleans. Most troops in New Orleans didn't go backpacking -- why would anybody want to go backpacking in the South? Isn't it too hot, too humid, too wet, etc., etc.? When we first suggested backpacking as an activity, we got some push back from some of the youth and their parents. We implemented a backpacking program in our troop and it was one of our best activities. Here in California, we have great weather, numerous destinations, and much variety. So, whether you live in an area surrounded by swamps or live among great backpacking areas, why go backpacking?

Of course, backpacking is a great exercise. But beyond that, there is something innately pleasurable about being outside, far away from civilization, with everything that you need to survive (at least for a few days) on your back. After the first few hours of physical hurt, your second wind kicks in and time seems to slow down, and we have time to focus on things that really matter.

> *"Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves." John Muir*
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> *"I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived." Henry David Thoreau*
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> *"I want to know how God created this world. I am not interested in this or that phenomenon. I want to know His thoughts, the rest are details." Albert Einstein*
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> *"Men go back to the mountains, as they go back to sailing ships at sea, because in the mountains and on the sea they must face up, as did men of another age, to the challenge of nature. Modern man lives in a highly synthetic kind of existence. He specializes in this and that. Rarely does he test all his powers or find himself whole. But in the hills and on the water the character of man comes out." Abram T. Collier*

Why teach backpacking to youth? When you have to be totally dependent on only that which you can carry, you develop a higher level of self reliance. The trip needs real planning. You need to think about what is important and what is a luxury. Once on the trail, backpacking builds strength. You need to stick together as a patrol. You need to be able to adapt to situations – in the middle of a 50-mile hike, it is 25 miles back and 25 to finish – finishing is just as easy as quitting. Backpacking is hard and completing a hard thing builds character and confidence. The challenge of doing hard things is fun.

Finally, so much of what youth do these days is book learning, classroom lectures, and theory. Backpacking and camping are real – a scout can implement theory on a backpacking trip and come away from it really knowing something. And, the teamwork and personal interactions that are fostered on a backpacking trip develop character – the scout will have opportunities to put to use the Scout Oath, Law, Motto, and Slogan.

A word about the syllabus. I taught an Advanced Backpacking course in a 2002 University of Scouting in New Orleans where I introduced our troop's experience to other area scout leaders. This syllabus was mostly created for that training program. Most of the syllabus was copied and pasted (and sometimes adapted) from Internet sites (particularly REI.com and books that I own). In preparation for 2006, I updated and adapted the text slightly, but most of it stayed the same. I apologize, but I have not sourced things. There is a lot of information available, perhaps too much. So, I have selected that which I generally agree. Hopefully, I am no too opinionated for your tastes. Hopefully, you will find the following material useful. And, I hope you go backpacking. Enjoy!

Selecting Gear: What's the Right Amount?

How much gear do you need for a safe and satisfying experience in the wilderness? It's a question that yields no easy, one-size-fits-all answer. Your decisions will depend on:

- Your level of outdoor experience.
- Your style of backcountry travel (Do you like low-key strolls? Or high-risk expeditions?).
- Your long-term ambitions.
- Your personal comfort level.

Some basic guidelines, though, can be applied to nearly everyone. Here are some suggestions you might find helpful:

Fundamental Gear Guidelines

- Select equipment designed to perform in the **toughest overall conditions** you anticipate experiencing. It's better to be a little over-prepared than to find yourself 20 miles from the trailhead and wishing you had chosen a sleeping bag rated 10 degrees warmer.

- Conversely, **don't go overboard** buying too much gear, or expedition-level gear that exceeds your realistic needs. For instance, you probably don't need a GPS receiver for modest strolls in nearby foothills. Good equipment is a big help in the wilderness, but don't view it as a replacement for backcountry smarts and good preparation. Your most valuable asset in the wilderness is an assured, well-informed mind.

- Choose gear that best accommodates your **long-range ambitions**; look beyond your near-term trip and anticipate what your needs will be 2, even 5 years ahead.

- **Try before you buy**. Rent gear or borrow it from friends to help you gain insight on backcountry equipment. It will make you a savvier shopper when you finally make a purchase.

- **Start with the essentials**; add gear as you gain experience. If you are new to outdoor adventure, multi-purpose clothing makes a smart first purchase. Start with a light- or midweight synthetic top, one that wicks moisture from your skin. These garments will work well on the trail—or while biking, running or just working around the house. Another smart initial purchase: durable, trail-ready footwear. Consider a rugged trail shoe such as the men's Merrell Mesa Dry Lo or Timberland Omni Pass for women. They can handle wet sidewalks as well as slippery trails.

- **Know your personal preferences** and comfort level; work at keeping your load light, but carry enough items to ensure that you feel cheerful (maybe a few favorite food items) and secure (extra flashlight batteries) in the wilderness.

- Scan a trip-planning **checklist.** See what items you already have. Select a few items you would most like to own and begin researching them.

- Understand that all of your gear will wind up **on your back**; strive to be properly equipped while keeping your load light. Don't, for example, take both cups that came with your cookset if you only need 1; skip the lantern if you're already carrying a headlamp.

What About Price?

It's smart to shop for quality. The good stuff performs reliably and lasts for years. Happily, in this performance-minded industry, even modestly priced gear from established equipment-makers conforms to elevated standards of quality.

Many outfitters offer a product mix that caters to all experience levels and budgets. Lines of less expensive gear can be counted on to perform well in the field, delivering greater long-term satisfaction than lower-priced (and lower-quality) items found in department stores and mass discounters.

Many times customers tell us they "just want the best" when selecting new gear. That's good; just keep in mind that what's "best" for your ambition level does not necessarily have to be the most expensive item in the store.

Some Thoughts About Weight

Some outdoor purists lament that the modern wilderness visitor has become overly reliant on wonderfabrics and specialized gizmos. Recreational hikers, they believe, simply carry too much stuff into the woods.

We all like to travel light in the backcountry. Some ultralight hikers step out for week-long trips with all of their equipment and supplies stuffed into a compact daypack.

That's impressive. Yet a minimal load typically requires a wilderness traveler to make some soul-searching choices. For instance, should you:

- Skip a tent and opt for only a tarp?
- Leave the stove and fuel behind and rely solely on ready-to-eat foods?
- Minimize your clothing options?

Only you can answer such questions. Reflect on your past outdoor experiences. Can you live the life of a backcountry minimalist and remain content? Or are you really a hedonist at heart? Or do you fall somewhere in between?

We encourage backpackers to travel wisely and lightly. So don't take 2 fuel bottles when 1 will do. Carry a 4-ounce tube of sunscreen, not a 32-ounce bottle. If your tent came with 12 stakes, do you really need to carry them all?

Tip: Minimize; just don't compromise.

Quick Review

The reason you carry gear is to help you feel **comfortable, secure and content** in the wilderness. How much is enough? It depends on your individual standards of comfort, security and contentment. How can you know what those are? Take a hike, get some experience, ask friends for advice—educate yourself about what factors are most important you in the outdoors. Equip yourself accordingly.

Bottom line: Know thyself. It's your best first step when approaching a gear purchase.

How to Choose a Backpack

Some people need to get out more. Way out, that is — beyond the limits of a day hike, out to lovely, lonely places where a person has the time and space to absorb the deeper satisfactions of what John Muir described as "vast, calm, measureless mountain days."

In the last year, 29% of Americans camped overnight at least once. Less than a fourth of that group actually hiked and camped more than 1/4 mile from where they parked their vehicle.

— Leisure Trends Group, 1999 data

It takes a backpack to get you there. Modern backpacks, unlike their shoulder-gouging ancestors that you sometimes still see hanging in a neighbor's garage, feature intelligent design concepts that provide surprising comfort and load-carrying efficiency. Such advancements have made the art of self-propelled adventure a much more agreeable pursuit.

Here are some tips that can help you sort through your options:

Select Your Style: Internal or External

Long-haul backpacks (suitable for 2-day trips or longer) are known as frame packs, meaning a metal frame supports the packbag and helps focus the weight where your body can most effectively carry it — on your hips. Manufacturers offer 2 styles of frame packs: **internal-frame packs** and **external-frame packs**.

Internal-Frame Packs

Internals feature a narrow, tower like profile and integrate their framework inside the pack, behind the shoulder harness. The frame usually consists of "stays," or flat bars, about an inch wide and 1/4 inch thick. Stays are usually aluminum and are configured in a V-shape. Alternative frame materials (composites) and stay-alignments (parallel, X-shaped; U-shaped) are sometimes used. The hipbelt is removable and can be shaped to conform to your torso.

Internal Frame Pack

Internals are popular packs with many advantages:

- **Flexibility.** Stays make internals stiff, but not rigid. This allows the pack to more easily move in harmony with body movements, a big plus for climbers and skiers.
- **Balance.** Internals hug your body. This holds your equipment closer to your natural center of gravity and helps you keep your balance when it counts — for example, while you're scooting across a log above a stream.
- **Stability.** Compression straps are everywhere on an internal. You use them to cinch down your load and keep individual items bunched together. This keeps them from shifting and throwing you off-balance if you make any abrupt moves.
- **Maneuverability.** Because internals feature a slimmer shape, it's easier to swing your arms freely — another reason why these packs are popular with climbers and Nordic skiers. This narrow profile also helps hikers whenever they have to squeeze through tight spots or when they're bushwhacking through thick brush.
- **Adjustability.** Internals use suspension systems (involving the shoulder harness and hipbelt) that can be adjusted more precisely than external-frame systems.

The downside of internals:

- **The black hole.** Most internals have 1 cavernous main storage compartment, plus a separate section for a sleeping bag. Other than a lid pocket, nearly everything gets stuffed into that single, deep compartment. So, if it's necessary to find 1 particular item during a rest stop, you may have to hunt a while to locate it. Want some packing tips? See “How to Pack a Backpack” section below.
- **Hot stuff.** You'll sweat more wearing an internal because it rides so close to your back. The design offers little room for ventilation.
- **Cost.** Internals typically cost more than externals of a similar size.

External-Frame Packs

Externals connect a packbag to a rigid frame made of aluminum tubing. Externals ruled the backcountry until internal-frame design was introduced in the late 1970s. Internals have surged in popularity, yet externals are still a great choice for transporting heavy loads along trails. With an external, the pack's weight sits more squarely on your hips; with an internal, the back, shoulders and hips share the load.

External Frame Pack

The advantages of externals:

- **Cooler to carry.** An external's load does not sit flat against your back, allowing air to circulate.
- **Easier to pack.** Externals feature at least 2 main compartments plus several side pockets. You can organize your gear into "zones" and locate it more easily.
- **Heavy loads won't sag.** They might in an internal, depending how you pack it. Plus, since your center of gravity sits higher in an external, it's easier to walk upright.
- **Cost.** You'll pay less for an external.

The shortcomings of externals:

- **Minimal agility.** They tend to make you walk more stiffly, making externals cumbersome when you try to walk off-trail. Attempting to scramble up rocks or hop across a boulder field while wearing one is difficult, even unpleasant.
- **Poor traveling companions.** Sometimes you can squish a loaded internal into a car truck or back seat; an external frame won't give an inch. Plus, in the luggage-transport systems of airports, externals sometimes can take a pounding.

Rucksacks

Rucksacks are a third category of overnight packs. These are usually frameless packs (some models include a single stay) that can store between 2,500 and 3,500 cubic inches of gear, enough for 1 or 2 nights — or more, if you are an ultralight specialist. These are essentially overgrown daypacks and often feature lightly padded backs. They are popular with skiers, trail-runners, rock scramblers and peak-baggers.

Which Is Best for Me?

The answer depends on your hiking style and the types of places you explore most often.

Which people are better suited for an **internal**?

- Climbers/mountaineers
- Scramblers/peak-baggers
- Skiers
- Off-trail (cross-country) hikers covering rough terrain

Why? The snug fit of an internal allows your load to move with you, helping you stay balanced and agile on uneven terrain. Recreational backpackers have also grown to prefer internals, valuing their comfort and versatility. Internals have emerged as very popular general-purpose packs, typically outselling externals by a sizable margin.

Which people are better suited for an **external**?

- Beginning hikers
- Hikers hauling heavy loads over easy to moderate trails and terrain

Why? Externals appeal to juniors and beginners because they cost less. For people toting monster loads, the frame becomes an efficient extension of your upper thighs and pelvic region — an area of stout bones and thick muscle groups that are well-suited to the task of bearing the weight of a backpack. Are externals becoming obsolete? Don't count on it. Tradition is on their side, and they're a great bargain.

What Features Should I Look For?

Hipbelt: Generously padded hipbelts (unlike the thin cloth waistbelts found on Sixties-era backpacks) represent a major advancement in pack design and greatly enhance your ability to carry tonnage into the backcountry.

Most consist of various grades of foam: open-cell foam for cushioning, closed-cell or molded foam for firmness. The hipbelt should straddle your "iliac crest" — the 2 prominent bones on the front of your hips. This is the area where your pelvic girdle begins to flare out, providing the hipbelt with a stable, fortified foundation.

Some packs offer interchangeable belts, permitting a more customized fit, and even belts where the angle of the fit can be adjusted. The hipbelt's padded ends should not touch; you need some space to be able to cinch the belt securely. On the other hand, don't tighten a belt excessively. Your hips could be irritated if you do.

Internal-frame models include a lumbar pad. This large pad should offer cushioning yet should not feel spongy. If it does, it could break down quickly under a load.

Framesheet: Some internal packs place a thin but stiff sheet of plastic between you and the packbag. Often this is a material known as HDPE, or high-density polyethylene. This adds stiffness to the frame without adding much weight. Plus, it prevents objects in your pack from poking you in the back.

Internals sometimes include some type of mesh or foam panel that rests near the middle of your back. This is an attempt to separate the pack from your back and encourage some air flow between the two. It

offers modest help. Here is a trail-tested truth: Count on having a sweaty back if you tote an internal.

Suspension system: This involves the shoulder straps (padded and contoured), load-lifting straps, a sternum strap and belt-stabilizer straps. These items, and tips for adjusting them, are discussed in our clinic “How to Fit a Backpack” section below. So-called ladder suspensions typically allow you to reposition the shoulder harness in 1-inch (or, preferably, smaller) increments. The more fine-tuning a pack permits, the better the fit.

Packbags: Common materials are packcloth (a sturdy grade of nylon) and Cordura, a burly fabric with a brushed finished. Both resist abrasion and are coated for water resistance. Cordura is tougher and a bit heavier. Ballistics nylon, a strong, lightweight material, has popped up in newer pack designs and seems to work well. Internals usually offer an "extendable collar" or "spindrift collar" — additional nylon with a drawstring closure that allows the main compartment to stretch higher and hold extra gear.

Detachable pocket: Many internals allow you to detach the "floating lid" pocket from the pack and convert it into a fanny pack or daypack. That's a handy feature when you choose to make day hikes from a backcountry basecamp.

Water-bottle holders/hydration pockets: Externals offer plenty of side pockets where you can stash a water bottle. Internals rarely do, although several now offer elasticized mesh "holsters" on the side where you can keep small bottles handy. Hydration systems (water reservoirs, or bladders, connected to a long sipping hose) have boomed in popularity. Many high-end packs now offer such systems.

Extras and attachments: Lash points allow you to attach even more gear to your pack if you feel the need. Climbers and early-season hikers should look for **ice-axe loops, daisy chains** (a series of small loops where you can dangle gear, such as carabiners) and **crampon patches**. A so-called **shovel pocket** holds items tight against the back of your pack; it's a good place to stash wet things. All of these extras, of course, add weight to a pack.

Loading options: Most internals are "top-loaders," where all gear passes through one big hole at the top of the packbag's main compartment. This requires you to keep quick-access items near the top. Some internals now provide zippered, slit-like openings on the sides of their main compartments. This allows you to stash smaller items (water bottles, for instance) lower in your pack but still have quick access to them. Most externals, meanwhile, are "panel-loaders." In this configuration, a zipper follows a U-shaped track along one side of a compartment. When unzipped, the compartment's side panel falls away like a flap to give you wide access to the compartment's interior.

Packs for women: Several packs, both internal and external models, have been modified with narrower shoulder straps, smaller hipbelts and shorter torso lengths.

Packs for travel: Travel packs offer you the ability to conceal and protect a pack's suspension system when using it on public transportation. Typically, the suspension systems are not quite as substantial as regular internal-frame packs.

Packs for kids: External-frame packs are traditionally the first choice for a youngster's first pack. Some options: The REI Long Trail Jr., the Long Trail Regular and Long Trail Large; the JanSport Scout II and the Kelty Yukon. Midsize daypacks may be sufficient if an adult can transport the child's sleeping bag. If your child needs to be self-sufficient, one of the beginning externals mentioned, all under $100, represent good choices.

Packs for dogs: Even your pooch can carry a pack. Dog packs are sized according to a dog's weight.

How Much Can I Expect to Spend?

Many outfitters offer some external-frame packs for less than $100; a few high-end internals sell for nearly $500. Most internals cost between $200 and $350. Externals rarely exceed $200.

If you regularly visit the backcountry and anticipate at least a couple of overnights trip per year, invest in a quality pack with a capacity that matches your ambitions. Inexpensive discount-store backpacks are poorly made, rarely last, have inadequate padding and can be miserable to wear. An uncomfortable pack can ruin an otherwise beautiful outing.

Consider renting a pack before buying your first backpack. It will help you become better acquainted with how a pack fits and performs. A good rental shop such will adjust a pack to conform to your body shape.

What's the Right Capacity?

As the phrase goes, your numbers may vary. But here's a general guide for internals:

Up to 3,000 cubic inches: Good for day hiking or a 1-night trip in warm weather where your supplies will be minimal.

3,000-4,000 cubic inches: Enough space for 1- or 2-night trip. You can go even farther if you team up with a partner who could help carry the load of shared items.

4,000-5,000 cubic inches: Generally good for up to 3 days of overnight camping.

5,000-6,000 cubic inches: Can accommodate up to 6 days of overnight camping. The lower end of this range is good for most backpackers. Don't buy too large a backpack, though, if you don't anticipate needing the space. The more compact and lightweight your load, the better.

6,000-plus cubic inches: For long hauls lasting a week or more.

> **Keep in mind: Capacity figures** for internal and external packs **vary significantly.** Sleeping-bag storage accounts for the discrepancy. Internals carry sleeping bags in a special compartment behind the hipbelt, and synthetic bags can consume 2,000 or more cubic inches of a pack's stated capacity. With externals, bags are usually strapped to the underside of the packbag. This does not influence the pack's capacity figures.
>
> **By the numbers:** Not every manufacturer measures cubic inches the same way. So one company's measurement of 4,000 cubic inches may differ a bit from another company's calculation.
>
> **Weight:** Internals tend to be a touch lighter, but the differences are minimal. Large packs can weigh up to 8 pounds. That's 8 pounds on your back before you add any gear! This should remind you to buy a pack that fits your ambitions. If you hike only modest distances, you don't need a monster pack.

How Do I Know If It Will Fit?

Fit is crucial. Follow the guidelines detailed in “How to Fit a Backpack” section below. DO NOT SKIP THIS STEP!

The clinic will offer instruction on:

- Measuring your torso
- Selecting a pack size appropriate for your torso length
- Custom-fitting a pack to your body
- Interpreting product specification charts

What Else I Should Know?

- As the fitting clinic points out, people may be the same height yet have different torso lengths. Make a backpack purchase based on your torso length.
- How do you hoist a heavy backpack onto your back? Study the tips found in “Packing a Backpack” clinic.
- If a pack feels burdensome while you walk, consider porters in Nepal who still transport large loads on their backs using a tump line — a long strap of fiber that wraps around the load, then is worn across the forehead.

Quick Review

Internal-frame packs, with their body-hugging design and low center of gravity, are ideal for any outdoor activity — mountaineering, skiing, scrambling and hiking on- or off-trail. They offer you good balance and more freedom of movement. Internal packs are the popular choice of most outdoor adventurers.

External-frame packs are good choices for carrying heavy loads over easy to moderate terrain, primarily trails. Their rigid design makes you walk more stiffly and is not the best for rock-hopping or other types of cross-country travel. They cost less than internals.

Rucksacks are, in essence, extra-large, frameless daypacks that can accommodate enough gear for a lightweight overnight trip.

Fit is crucial. Make sure you review “How to Fit a Backpack” clinic and make the effort to have your pack customized for your torso.

How to Fit a Backpack

Forget about the color and the fancy logos. What really matters when selecting a new backpack is making sure that it's a good fit for your body.

You want to choose a pack well suited to your individual dimensions, then you need to customize it to your body shape. Here are some tips to help you accomplish that:

Determine Your Torso Length

Torso length is a crucial measurement. It is important to distinguish between your height and the length of your torso. Just because you are a certain height — say a 5' 9" female or 6' male — does not mean you automatically need a "large" or "tall" pack. Your torso length, not your height, determines your pack size. Here's how to measure yours:

- Enlist the help of friend. Have that person locate the bony bump at the base of your neck, where the slope of your shoulder meets your neck. (It's known as the 7th vertebra.) Tilt your head forward to locate it more easily.
- Using a flexible tape measure, ask your friend to start at that spot and measure down your spine, following the curves of your back along the way.
- Place your hands on your hips so you can feel your iliac crest—the twin pointy protrusions on the front of your hips. (The iliac crest serves as the "shelf" of your pelvic girdle, the area that is gripped by your pack's hipbelt.) Position your hands so your thumbs are reaching behind you.
- Have your friend finish measuring at the point where the tape crosses an imaginary line drawn between your thumbs. This distance is your torso length.

Generally, your measurement will fall into one of these frame-size categories:

Small: Up to 17 1/2".

Medium/Regular: 18" to 19 1/2".

Large/Tall: 20" and up.

Pack manufacturers typically use general terms (small, medium, large) to identify their frame sizes; look at each pack's technical specifications to find the actual numeric range. You may want to go to the manufacturer’s website or an outfitter’s like REI.com to get a chart that accompanies gives the pack’s specific description.

A person with a measurement right on the border (say, 17 3/4") might want to visit an outfitter’s store to try on both a small and medium version of a particular pack. Many outfitters’ product line includes adult packs sized to fit torso lengths as compact as 14" (10" for children) and as long as 23". If your measurement lies outside that range, you might require a custom-built pack.

Determine Your Hip Measurement

While not as crucial as your torso length, your hip measurement is useful to know. It's very helpful if you are considering a pack that offers interchangeable hipbelts.

Take your tape measure and wrap it around the top of your hips, the "latitude line" where you can feel your iliac crest — those two pointy bones just above the front pocket on your pants. A properly positioned hipbelt will straddle your iliac crest, about an inch above and below that line.

Test Fit Your Backpack

Shopping for a backpack online is not the same as examining the packs firsthand. How do you know if it's going to feel good without first trying it on? A comfortable fit, after all, is crucial to your satisfaction.

Ideally, you should visit an outfitter in person and try on some packs. If that's not possible, try the procedure described below at home with any pack you order. If it just doesn't feel right, send it back. Many outfitters will accept returns -- they don't want you to try and lug an uncomfortable pack into the wilds. And, they want your return business. To be fair, you need to keep in mind that no fully loaded pack ever feels truly "comfortable." What you are seeking to avoid is any sharp or unreasonable discomfort.

A Good Fit, Step by Step

If possible, start with about 20 or 30 pounds of weight to place inside the pack: sandbags or weighted pillows supplied by the store; items of personal gear packed into stuff sacks; climbing ropes. (If you're able to visit a store, throw some things in a duffel bag and bring them with you.) Distribute these throughout a pack's interior, keeping the weight close to your body with the heaviest portion near your shoulder blades. Next:

1. Loosen the pack's shoulder straps, load-adjustment straps and hip belt.

2. Slip your arms through the shoulder straps.

   Tip: What's the best way to hoist a heavy pack on your back, you ask? See the “How to Hoist a Backpack” clinic below.

3. Position the hipbelt so it basically straddles your hipbones (iliac crest); close the buckle and make the hipbelt straps snug.

   Tip: The belt should completely, comfortably cover your hips, but its two ends should not touch. If the belt is too loose or too tight, reposition the buckle pieces on the hipbelt straps. If this doesn't give you a secure fit, you may have to try a different pack or hipbelt. Do not tighten your hipbelt excessively. Keep it snug, but if it's too tight or too long on the trail, you'll have sore spots on your hips the next morning.

4. Cinch the shoulder straps down tightly, then ease the tension slightly.

5. Look sideways in a mirror. Check the position of your shoulder straps:

- For internal-frame packs: The padded sections of the shoulder straps should wrap around the crest of your shoulders comfortably and attach to the frame about 1" below that point. No gaps should appear
- For external-frame packs **without** load-lifter straps: The shoulder straps should attach to the pack frame at a point slightly higher than the top of your shoulders.
- For external-frame packs **with** load-lifter straps: The padded sections of the shoulder straps should wrap around the top of your shoulders comfortably and attach to the frame about 1" below that point.

6. Check your load-lifter straps. These should attach to your shoulder straps at a point just above your collarbone and just below the top of your shoulders. From there, they should rise up to join with the frame at an angle of between 40 and 50 degrees. If the angle is higher than that, your frame is too long. Any lower and your shoulders will carry too much of the load.

7. Check the shoulder strap length and width:

    - The buckle on the strap should be far enough below your armpit that it won't chafe. How far? Try a hand-width.
    - The straps should be far enough apart that they don't squeeze your neck, but close enough together that they don't slip off of your shoulders during hiking. The width is sometimes adjustable.
    - Women need to pay special attention to the fit of shoulder straps. On some unisex packs, the distance between shoulder straps may be too wide, or the straps themselves are wide enough to gouge an armpit or breast. If you find a good fit is elusive, seek out a pack designed specifically for women.

8. Check for a good torso fit. If the pack fits you correctly, you should be able to redistribute the weight of the pack between your shoulders and your hips simply by loosening and tightening your shoulder straps slightly.

    Tip: Make any adjustments by moving the shoulder harness up or down, using whatever means the individual pack provides. On a "ladder" system, for instance, you can rethread the webbing and fasten it at a new position on the ladder.

9. Adjust the sternum strap. Position it about 2" below your collarbone. You should be able to breathe comfortably when the strap is fastened. It is not essential that you keep your sternum strap fastened at all times. It is most helpful when you are negotiating uneven terrain.

10. Check for comfort:

    - Does the pack feel good on your back?
    - Does it pinch or bind or unusually restrict your movement?
    - Can you look up without hitting the pack with your head?
    - Can you squat down without cutting off the circulation to your legs?

    This may seem like a lot to keep in mind, but all of the above will become automatic as you gain experience. Now walk around with your pack. Climb and descend a flight of stairs. Hop from spot to spot. Reach. Walk a line. If anything is pinching, try adjusting the various straps.

Additional Considerations

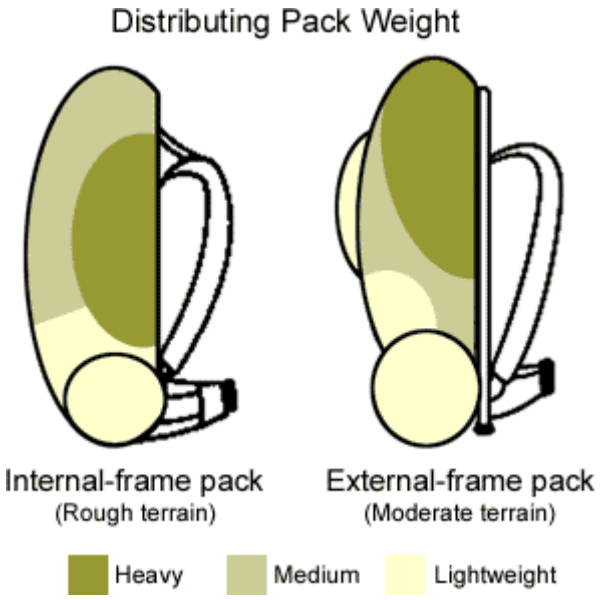
Bending the stays: The stays that serve as the frame of internal-frame packs are almost always removable and can be bent to conform to the contours of your torso. How meticulously and precisely should they be bent? It's a matter of choice. It's usually sufficient to give the stays a modest bending so they follow your spine's natural S-shape. To make sure your stays are not damaged when bending them, it's best to have a trained technician bend them for you.

Breaking in your pack: Ideally, make your first trip with your new pack a short one. You can make some modest adjustments during rest stops. Over time, with regular wear, items such as internal stays and the padded hipbelt will conform to your body configuration.

How to Pack Your Backpack

You've planned, shopped and prepared. Now it's time to load up and head out. What's the smartest way to get all that gear into your backpack?

It depends on what you're carrying (internal-frame pack or external?) and where you're going (on-trail or off-trail?).



Internal-Frame Packs

- Whether you're traveling on- or off-trail, keep your **heaviest items close to your back,** centered between your shoulder blades.
- For **on-trail** travel, keep heavy items **higher** inside your pack. This helps focus more of the weight over your hips, the area of your body best equipped to carry a heavy load.
- For **off-trail** exploration, reverse the strategy. Arrange heavier items **lower** in the main compartment, starting again from the spot between your shoulder blades. This lowers your center of gravity and increases your stability on uneven terrain.
- Stuff your **sleeping bag** into its lower compartment first. Squeeze in any additional lightweight items you won't need until bedtime (pillowcase, sleeping shirt, but nothing aromatic). This will serve as the base of the main compartment, which you'll fill next.
- **Tighten** all compression straps to limit any load-shifting.

External-Frame Packs

- As with an internal, keep your **heaviest items close to your back,** near your shoulder blades.

- Externals are recommended for **on-trail travel only.** Load heavier items **high** inside your pack and close to your body. Doing so centers the pack's weight over your hips and helps you walk in a more upright position.
- Pack your **sleeping bag** in its stuff sack. Finish loading your main packbag, then strap the bag to the lash points on the bottom of the packbag. If rain seems likely, consider stuffing your sleeping bag inside a second stuff sack or wrapping it in plastic.

Tips for Either Pack Style

- **Women** and people of short stature often find they prefer to pack the weight low whether they're traveling on- or off-trail, regardless of which pack style they're carrying. You are the ultimate judge of what feels comfortable to you. Experiment with different load arrangements to determine what feels best.
- Make sure some items are **easily accessible,** packed in places where they can be reached with a minimum of digging:

Map	Compass
Sunglasses	Insect repellent
Snack food	Flashlight/headlamp
First-aid supplies	Water bottles
Rainwear	Packcover

- Don't waste empty space. **Cram every nook** with something. Put a small item of clothing inside your pots, for example. Smaller items, such as food, pack more efficiently in individual units rather then when stored loosely inside a stuff sack.
- If you are part of a group, **split up** the weight of large items (a tent, for instance) with other group members. Don't make 1 person become an involuntary packhorse.
- **Cluster** related small items (such as utensils and kitchen items) in **color-coded stuff sacks** to help you spot them easily.
- Minimize the number of items you **strap to the outside** of your pack. Gear carried externally may adversely affect your balance. Secure any equipment you carry outside so it doesn't swing or rattle.

  Tips: How about **long tent poles,** for example? Stow them horizontally with your sleeping pad across the top of an external pack; with an internal, carry them vertically, secured behind the compression straps on one side of the pack with the ends tucked into a "wand pocket" at the pack's bottom. A **daisy chain** and **ice axe loops** are designed for specific mountaineering gear; feel free to improvise with them, but don't get so creative that you jeopardize your comfort or stability.

- Make sure the cap on your **fuel bottle** is screwed on tightly. Position it below your food inside your pack in case of a spill.
- Carry a **packcover.** Backpacks, though made with waterproof fabric, have vulnerable seams and zippers. After a few hours of exposure to persistent rain, the items inside your pack could become wet—and thus much heavier.

Quick repair tips: Wrap strips of duct tape around your water bottles; in case a strap pops or some other disaster occurs, a quick fix could keep you going. Take along a few safety pins in case a zipper fails.

How to Hoist a Loaded Backpack

Once you stuff your backpack, how do you get that big honker on your back? Try these steps:

1. With the pack sitting upright on the ground, move one of your legs close to it and, with one hand, grab the pack's haul loop. (That's the half-circle of webbing stitched into the pack just above the shoulder harness.)

2. Using a wide stance with knees bent, slide the pack up the side of your calf. Bring it up to your thigh and let it rest. Your thigh should be roughly parallel with the ground.

3. Steady the pack with one hand. Slip the other arm and shoulder through one of the shoulder straps, pushing your shoulder in as far as you can.

4. Without any abrupt or jerking motion, swing the pack onto your back and slip your arm through the other shoulder strap.

5. Buckle the hipbelt first, then cinch down the shoulder straps. Lastly, adjust the load-lifter straps. You're set to go! When you're ready to remove the pack, be sure to first loosen the shoulder straps.

Tip: As you walk throughout the day, tinker slightly with the tightness of your hipbelt and shoulder straps. A brief amount of relief might help your hips or shoulders feel less fatigued.

How to Choose the Right Footwear

Choosing the right footwear may be the most important decision you make as a beginning backpacker. The shoes or boots you choose must be comfortable, durable and protective, mile after mile.

Step #1: Consider the Kinds of Trips You Have Planned

Outdoor footwear can be divided into 3 basic categories. Begin your search for the right boots or shoes by focusing on the category that best matches your backpacking plans.

- **Lightweight hiking** - These boots (and trail shoes) are designed for day hiking and very short overnight trips only. They stress comfort, cushioning and breathability. As a result, they are less supportive and durable than the options below.

- **Midweight hiking/backpacking** - These boots are designed for on- and off-trail hiking with light to moderate backpacking loads. They are more durable and supportive than lightweight hiking boots, but they are still intended primarily for short to moderate trips over easy to moderate terrain.

- **Extended backpacking/mountaineering** - These boots are designed for on- and off-trail hiking with moderate to heavy backpacking loads. They are designed with multi-day trips in mind. Durable and supportive, they provide a high degree of ankle and foot protection. Some of these models are designed specifically for rough terrain with heavy backpacking loads. They offer the very best in durability, support and protection. Some are stiff enough to accept crampons for snow/ice travel.

Step #2: Consider the Materials

The materials used in a given boot or trail shoe will affect its weight, breathability, durability and water-resistance. Since boots made of different fabrics can be very similar in performance, however, personal preference is often the key when choosing between them.

- **Nylon mesh and split grain leather** - Nylon and split-grain leather boots are lightweight and breathable, which makes them perfect for warm- to moderate-weather use and short to moderate backpacking trips. They tend to be softer on your feet, they take less time to break in, and they are almost always lighter than full-grain leather boots. They also cost less. Unfortunately, nylon/split grain boots tend to be less water-resistant than full-grain leather boots (although styles that feature waterproof liners can be just as water-tight, if not more so).

- **Full-grain leather** - Full-grain leather is extremely water-resistant, durable and supportive (more so than split-grain leather or nylon). It's used primarily in backpacking boots designed for extended trips, heavy loads and hard terrain. Not as lightweight or breathable as nylon/split grain combinations, but it typically lasts far longer. Full-grain leather usually requires a break-in period..

- **Waterproof barriers** - Lightweight, waterproof barriers (like Gore-Tex®) are built into many hiking boots to enhance their water resistance. These barriers are available in a variety of boot styles, from lightweight hikers to extended hiking/backpacking models. Waterproof performance depends upon the type of barrier used, the materials protecting it and how well the boots/shoes are taken care of. If cared for correctly, these waterproof barriers often last longer than the boots themselves.

NOTE: Be careful when shopping for backpacking boots to differentiate between the following:

- **Waterproof leather** -- This is leather that's been treated to be waterproof. It's great stuff to have, but remember -- leaks may still occur (depending on how well the boot pieces are put together).

- **Waterproof (or water-tight) construction** -- This refers to construction techniques designed to keep leaks out (like seam-sealing, special stitches and precise designs). Water-tight construction is typically combined with waterproofed materials.

- **Waterproof liners** -- These are the special waterproof barriers described above that are built right into the boot to protect you from whatever leaks make it through the boot materials. These liners typically do a great job of keeping you dry. But remember, Gore-Tex (and the others) don't last forever.

TIP: The waterproofness (or water-resistance) of your hiking boots depends significantly on how well you treat them. Be sure to follow all care instructions that come with your boots so that they can perform well and last a long time.

Step #3: Consider the Way the Boots are Constructed

Upper construction
The more seams a boot or shoe has, the higher the risk for leaks and/or blow-outs. Leaking occurs when water seeps through the needle-holes or spaces between the boot panels. Blow-outs occur when general wear, repeated flexing or a snag causes a stitch to break and 2 panels to separate. In general, the less seams an upper has, the more water-resistant and more durable it will be.

The connection between the upper and the sole
Hiking boot soles are either stitched or cemented to the rest of the boot.

- **Stitching** - Durable, reliable, can be undone to replace the sole once it has worn down. Different techniques (Littleway, Norwegian) result in different strengths and stiffnesses.

- **Cementing** - Faster and less expensive than stitching, resulting in lower boot prices. It hasn't always been reliable, but most modern methods produce durable, lost-lasting bonds (depending upon the process and specific glue used). Most cemented boots can now be resoled just like traditional stitch-down models.

Step #4: Test for Fit

Once you've narrowed down your options to a handful of boots or shoes, the best way to decide between them is to try them on. Don't rely solely on your "regular" shoe size when searching for the best fitting boots or shoes. One manufacturer's "9" may vary widely from another's (see below).

Fitting tips:

- **Begin with a foot measurement** - Have an experienced salesperson measure both of your feet using a Brannock device. Use these measurements as your starting point for trying on boots. If one foot is larger than the other (which is quite common), fit your larger foot first. You may need to use extra socks or an insert to take up extra space in the other boot.

- **Pick the right socks** - Wear the type of socks and sock liners that you'll be using out on the trail whenever you try on boots.

- **Check the initial fit** - Lace up the boots and stand up. They should feel snug around the ball and instep of your foot, but loose enough that flexing your foot forward is not uncomfortable. Your heel should be held firmly in place. If your foot feels like it's "floating" inside the boot, try a half size down. If your foot feels cramped or your toes make contact with the front or sides of the toe box, try the next bigger size.

- **Take a walk** - Take a walk and see how comfortable the boots/shoes are. Check for any looseness, foot movement and/or heel lift. Good-fitting boots will hold your feet firmly in place without binding or pinching them. New boots may feels a little stiff at first, but they should still be comfortable.

  After a quick walk across a flat surface, step onto an incline facing downhill (if one is available) to check for foot slippage. Your feet should not slide forward easily, nor should you be able to move your heel from side to side. If either of these is possible, try a smaller (or lower volume) boot. If your toes make contact with the front of the boot without much forward movement, try a larger size or a different boot.

- **Investigate your options** - Try on a number of boot models before you decide on a single pair, even if the first pair feels good. Every boot model is built around a different "last" (standard foot shape), so each one will grab you a little differently.

Boot Care Basics

Keep your boots and trail shoes clean between uses by brushing off dirt and mud (both can ruin leather over time). Most fabric boots/shoes can be washed on the outside with mild soap and water (not detergent).

If your boots get drenched, stuff them loosely with newspaper and dry them in a warm place. Never rush the drying process by placing them near a fire, heater or other heat source.

Boots, especially leather ones, should be conditioned from time to time to maintain your investment. This is true whether you hike in dry, hot conditions or wet, temperate ones.

Caring for your Hiking Boots

All hiking boots, especially leather ones, benefit from frequent cleaning and occasional conditioning with special boot treatments. These treatments condition leather and provide additional water protection to keep your feet dry.

Proper boot care and conditioning is important whether you hike in dry, hot climates or wet, temperate areas. Taking a little extra time to care for your hiking boots can add years to their useful lives.

Basic Boot Care
The key to keeping your boots in good shape is to keep them as clean as possible. Dirt particles are very abrasive and over time they can damage just about any boot material. It's hard to keep your hiking boots clean while you're using them, of course, but brushing the dirt and mud off them after every hike will help keep them in good condition.

Drying your Boots
Whenever possible, dry your boots completely after each trip. To dry them, simply store them in a dry, warm area. Don't set your boots near a fire (or other heat source) to dry them more quickly, since high temperatures can damage boot materials and the cements used to hold them together. If you need to speed up the drying process, try stuffing dry newspaper inside your boots to absorb water. Replace the newspaper frequently for best results.

NOTE: If your boots are wet and dirty, it's best to dry them first, then brush the dirt off.

Washing your Boots
Most fabric boots can be washed on the outside with non-detergent soap and water to remove built-up dirt. Leather boots can also be rinsed off, but repeated washing and drying can dry out the leather over time and make it brittle.

Footwear Repair
Repairing outdoor footwear is a complex task. Older boot designs (typically involving stitched welts) and modern footwear (where a wide variety of sophisticated adhesives are used to bond thermoplastic rubber soles to leather uppers) require different repair techniques, and cobblers possessing the expertise to repair both are rare. Dave Page, an independent cobbler with more than 30 years of experience is a good choice. Page is an authorized repair agent for Asolo, Vasque, Vibram, Montrail, Merrell, Salomon and many other footwear makers. He services an international clientele and repairs all kinds of boots, rock shoes and footwear. You can contact his shop directly for an evaluation of your repair needs.

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DAVE PAGE COBBLER

A Note on Oil Treatments
Avoid using oil-based treatments like Mink Oil on any leather hiking boots. Oil-based products are intended to soften leathers and make them more supple, which can negatively affect the support of hiking boots. Use wax or silicone-based treatments only.

How to Choose Backpacking Socks

The socks you wear on the trail can have a significant effect on your backpacking experience. Like footwear, socks must be chosen carefully to match the kinds of conditions you expect.

Step #1: Consider the Kinds of Trips You Have in Mind

Backpacking socks are designed to provide warmth, cushioning and abrasion resistance in a variety of conditions. The right sock for you depends on the kinds of trips you have planned and the weather conditions you expect. Here are the basic categories you have to choose from:

- **Liners** - Sock liners are thin, lightweight wicking socks designed to be worn right next to your skin. These liners wick sweat away from the surface of your foot to keep you dry and more comfortable. Liners also limit the amount of abrasion between your outer sock and your skin. They are designed to be worn under other socks.

- **Lightweight hiking/backpacking socks** - Designed for warm conditions and easy trails, lightweight backpacking socks stress wicking performance and comfort over warmth. These socks are thicker, warmer and more durable than liners alone. They also provide more cushioning. But they are relatively thin so that you can stay comfortable on warm weather trips. Because most lightweight backpacking socks are made from wicking materials, they can be worn with or without liner socks.

- **Midweight hiking/backpacking socks** - These socks are designed to provide reliable cushioning and insulation in moderate to cold conditions. They tend to be thicker and warmer than lightweight hiking socks. Many models have extra padding built into high-impact areas like the heel and the ball of the foot for maximum comfort. These socks should be worn with liners.

- **Mountaineering socks** - Mountaineering socks are the thickest, warmest and most cushioned socks available. They are designed for long trips, tough terrain and cold temperatures. Usually, mountaineering socks are too thick and warm for basic backpacking journeys in warm conditions.

Step #2: Consider Your Material Options

- **Wool** - Wool is an extremely popular natural sock material. It is warm, cushioning, and retains heat when wet. Unfortunately, wool can take a long time to dry and it can be scratchy next to your skin (NOTE: many new wool options, including mohair, do not have this problem). It can also wear out quickly if not reinforced with other materials. Wool blends (combinations of wool and synthetic materials) are extremely popular because they address many of these problems.

- **Synthetic insulating materials** – Many outfitters offer a number of man-made materials designed to insulate like wool and wick moisture, without the negatives mentioned above. These materials (Hollofil(R), Thermax(R), Thermastat(R)) trap warmth like wool, but they are softer on the skin. They also dry more quickly and are more abrasion resistant. These materials are available in a variety of sock styles and thicknesses.

- **Silk** - Silk is a natural insulator. It's comfortable and lightweight, but not as durable as other options. It's occasionally used in sock liners for reliable wicking.

- **Synthetics wicking materials** - The synthetic wicking materials (like polypropylene and Coolmax) used in wicking sock liners are often woven into thicker backpacking socks as well, to enhance wicking performance.

- **Cotton** - 100% cotton is not recommended as a sock material for backpacking. Cotton absorbs sweat, dries slowly, provides no insulation when wet and it can lead to discomfort and blisters out on the trail. However, cotton is extremely comfortable. And when combined with wool or other wicking and insulating fibers, cotton can be a great choice for light hiking in summer.

Cushioning materials - Many backpacking socks provide extra cushioning around the heel, the ball of the foot and the toe area to increase comfort. The padding is created either by increasing the density of the weave in those areas, or in some cases by weaving long-wearing materials like acrylic into those areas. This extra padding can be a real foot-saver on hard trips over rough terrain.

Support materials - Many of today's hiking socks include a small percentage of either stretch nylon or Lycra(R) spandex. These elastic materials help socks hold their shape and keep bunching and wrinkling to a minimum.

Step #3: Take a Test Drive

When possible, take a quick walk in the sock styles you are considering to get a feel for how much cushioning they have. And be sure to buy the right size--your socks should fit snugly. Bunched up sock material can make any backpacking trip an uncomfortable one.

How to Choose a Tent

Wind. Rain. Cold. Bugs. Dust. Creepy crawlers. If someone asks you why you feel the need to carry a tent into the backcountry, those are 6 good reasons.

Tents also provide a place of privacy in the middle of wide open spaces, plus an intangible feeling of security once you're zipped inside for the night. It's impressive how much comfort and reassurance we humans find between a few well-stitched panels of nylon. Which model is right for you? Here are some guidelines:

QUICK READ

1. Pick a tent equipped to withstand the harshest conditions you might encounter. Example: If you're a three-season backpacker who hikes late into the fall, you might want a four-season tent or a convertible model.
2. Four-season tents are roughly 10 to 20 percent heavier than three-season models (typically due to extra poles). Convertible tents allow you to add or omit poles and adjust ventilation as conditions dictate.
3. Freestanding tents (those that can stand without the aid of stakes) are very handy. You can move them easily or lift them to shake out debris. Very lightweight tents are rarely freestanding.
4. Capacity ratings, assigned by individual manufacturers, sometimes tend to be optimistic. A two-person tent may be a tight squeeze for two large adults and their gear.
5. Use a tarp, ground cloth or footprint to extend the life of a tent's floor.

Types of Tents

Backpacking tents fall into two general categories: three-season (general backpacking) and four-season (winter/mountaineering) models. Here's a look at how tents differ:

Lightweight **three-season tents** are intended for spring, summer and fall usage in temperate climates. They perform well in wind and rain, though their designs are not suited to handle significant snow loads. A three-season model won't collapse if two inches of snow fall on it, but 20 inches could be a problem.

Super-sturdy **four-season** tents usually integrate one or two additional poles into their designs to fortify walls and help them stand firm against severe wind or heavy snow loads. Winter tents feature some type of rounded dome design, thus eliminating flat spaces on a tent's rainfly where snow can accumulate. Of course, these winter/mountaineering tents work just fine during mild conditions. Their extra poles will make them a touch heavier than their three-season cousins.

Convertible tents are four-season models that can be converted into three-season tents. This usually involves shedding one or two poles from the tent's four-season design. Models may also offer zippered panels that can be opened during milder conditions or feature a detachable vestibule.

Warm-weather tents are lightweight shelters, usually designed for one or two people, that feature large mesh walls for superb ventilation. They can be used in three-season settings, but their special appeal is their usefulness in warmer, humid climates.

Single-wall tents are designed with the minimalist in mind. Essentially, they are rainflies equipped with a few vents you can zip open during warmer conditions.

Bivy sacks are minimalist solo shelters that offer little space for anything but you and your sleeping bag. (If you're a climber and plan to spend nights on steep rock faces where tents would be impractical, a bivy is definitely the way to go.) If saving weight is your chief priority, a bivy is worth considering. If you like room to move inside your shelter, look elsewhere. For more on bivy sacks, there is a section on bivies below.

Sleep screens and tarp tents are ultralight shelter options. Sleep screens, including screen houses, are useful in warm conditions and offer mesh coverings, some fully enclosed, some not, to keep occupants shielded from bugs, but not rain. Tarp tents offer minimalist shelter, at a minimal weight, for three-season usage.

Family (or basecamping) tents and shelters can accommodate large groups (between four and six usually, sometimes more). Dome-style models can be transported into the backcountry, as long as group members are willing to carry a share of the load; house-like models are intended for campgrounds and basecamps.

A Few Terms Explained

- **Dome Tents:** Most four-season tents involve some form of rounded, geodesic-dome design. Domes avoid flat spots and shed snow more easily. They stand strong in the wind and provide generous interior headroom.

- **Tunnel Tents:** Many three-season models use this narrow, linear design, typically involving a rectangular floor plan. Also called hoop tents, these models use fewer poles, less fabric and often have wedge-like shapes. Their rainflies, which lie flatter, can collect snow. A heavy snow load could flatten them.

- **Freestanding Tents:** Domes are freestanding, meaning they do not require stakes in order to stand up. You can pick up a freestanding tent (it's like a huge beach ball) and move it to a different location. You can also easily shake it out before you disassemble and pack it.

Which Type is Right for You?

Questions worth asking:

Q: What times of year will you use your tent?

- Winter campers need a four-season tent, period. If you have an Arctic expedition in mind, consult with people who have already made such trips and get their advice.
- If you're a three-season hiker who heads out in March or tries to squeeze in late trips in October and November, give yourself an extra buffer of security—get a four-season tent or at least a convertible.
- If you're a recreational traveler and do the bulk of your camping between May and September, choose a three-season model.

Q: How many people usually travel with you?

- Do you consistently travel with a partner? You need at least a two-person tent. Are the two of you large people? You might need to bump up to a 2-to-3-person model or even a three-person tent.
- Does your group size vary? You'll probably need more than one tent to fulfill your needs. If your budget is tight, buy the size that fits most of your trips; when your group size changes, rent a tent.
- If you're sharing a tent at the end of the day, share the load as you hike. Someone can carry the poles, another person the rainfly, and so on.
- Do you travel solo? If you demand lots of space, look for a compact two-person model. If you count every ounce, select either a bivy or a very light one-person tent.

Q: Won't a cheap tent from a discount store work just as well as a brand-name model?

- Department-store tents are typically mass-produced items that supply less attention to details. Example: Examine the stitches of a quality tent. You'll find a greater number of stitches per inch in that tent than you'll find in the discount tent, and you'll often find seam sealing. This means a stronger tent is at work for you when the weather turns nasty. Quality tents use high-grade aluminum poles. Bargain tents often rely on fiberglass poles, which are less shatter-resistant. Top-brand tents often give you more ventilation options as well.
- Inexpensive tents use large panels of coated nylon on their canopy (side walls). That material is not breathable, so if it's a balmy night, you might swelter inside.

Understanding Tent Specifications

When surveying the selection of tents, you'll find a general description and a list of specifications that accompany each model. These "specs" look technical, but the information is really quite helpful. It may take a little time, but do your homework and make comparisons between different tents' specifications so you make sure that you get the tent that meets your exact requirements.

Tent Capacity

Manufacturers classify their tents according to sleeping capacity: solo tents, two-person tents, three-person tents and so on. You'll also find references to items such as 1-to-2-person tents or a 2-to-3-person model. To better understand what all this means, we'll "go inside the numbers" to explain some terms in detail.

Range of Tent Sizes (Mountaineering and Backpacking)

Solo (1-person) tents: Personal, lightweight shelters for the rugged individualist—and not another soul. You'll find no fudge factor for extra space in this minimalist category, which includes bivy sacks.

1-plus or 1-to-2-person tents: These are shelters with enough space to provide a spacious shelter (at a reasonable weight) for a solo hiker and a snug fit for 2 people.

2-person tents: The most popular size in backpacking tents, with plentiful choices. Designs can vary widely, so seek out one that offers a combination of features that appeal to you.

2-to-3-person tents: These are 2-person tents cut wider and often taller to provide extra elbow room for its inhabitants. In a pinch, you could squeeze in a third person; it's unlikely, though, you would want to do so on a regular basis. These models can make good choices for parents with a small child.

3-person tents: If your trail party is consistently a threesome, these models are custom-fitted for your needs. Or, if you have a 2-person party and you simply prefer loads of room inside a tent and don't mind carrying a little extra weight, these models offer a luxurious amount of space.

4-person tents: Compact, low-profile group backpacking tents designed to be split up and carried by all members of the party. They typically weigh between 13 and 16 pounds. These also make good car-camping tents for those who want to avoid the bulk of a traditional cabin tent and don't mind a tent where you can't stand up.

Family (or basecamping) tents: A few models can be transported in the wilderness by several people who share the load. Standard family tents, meanwhile, use inch-thick poles and heavy-duty materials that are great for drive-in campgrounds.

Getting a Good Fit

How do you know if a tent is a good fit—physically—for you?

Here's one technique—not perfect, but certainly useful—to help you envision how you might fit into a tent: Measure your backcountry sleeping pad and use its dimensions as a general guide when you consider a tent's measurements.

- **Example:** The popular Therm-a-Rest standard model from Cascade Designs is 72" long and 20" wide. Width is the crucial measurement. To fit two people inside a tent, you will thus need at least 40 inches of width to feel even marginally comfortable—if you don't mind sleeping close. If you need a few inches of separation, then add a couple of inches to your measurement. If you thrash around a lot at night, you might need to add several inches.

Compare your numbers with the **floor dimensions** provided with each tent. That gives you some idea of how snug, or spacious, a tent might feel. Floor dimensions, of course, indicate only the maximum width a tent offers, typically the spot where your shoulders lie. Tents often taper in the foot sections, and walls angle in toward the ceiling. All of this impacts the amount of space found inside a tent's walls. Roomy tents are nice, but tend to weigh more.

Tip:—Looking at two-person tents? Consider one that could adapt well to some of your other travel plans. Maybe you're anticipating future solo hikes, or a long-distance bike trip. If so, a 1-to-2-person model might be a good choice. If you're a couple and you sometimes invite along a friend or relative, consider a 2-to-3-person, or even a three-person model. You'll like the flexibility, plus the extra bit of space, these models give you.

Additional Considerations

Do you camp often in rainy climates? Take a look at roomier tents, and consider adding a gear loft. That's basically a piece of interior netting that stretches out, hammock-like, near the ceiling of your tent. Overnight you can dangle damp items from a loft and hasten their drying process.

A tarp, ground cloth or footprint can help protect the floor of a tent and extend its life. Plus, it gives you a clean place to fold your tent in the morning.

A list of other helpful tips follows:

Weight: As a general rule, group backpacking tents should weigh approximately four pounds or less per person. Some 1-person or 1-plus tents exceed that guideline—understandable because a solo hiker will be toting all tent components (stakes, poles, etc.) on his or her own.

Pole sleeves or clips? Poles hold the tent's canopy upright and give you space to move around inside. Poles connect to the tent in one of two ways—via sleeves or clips. Some tents have "continuous" pole sleeves, meaning you don't have to thread poles through multiple sections of smaller sleeves. It makes tent setup a little easier and speedier. Clips are a breeze to use. They generally provide a larger gap between the rainfly and canopy, which helps minimize **condensation** on the body of the tent. Sleeves are considered more stable.

- **Note:** In damp or wet conditions, avoid letting your tent canopy touch the rainfly. If it happens, count on moisture invading your tent space at that point. Use guy lines to keep it taut.

Ventilation: On balmy or humid nights, you want your tent to encourage air flow. If you frequently hike in warm-weather environments, consider tents that offer plenty of mesh openings to take advantage of nights when you don't need a rainfly.

- **Note:** Ventilation is one reason why you want to buy a quality backpacking tent. Inexpensive **department store tents** offer very little, if any, breathable fabric on their canopy walls. If you're inside such a tent on a mild night, your body heat can turn it into a sauna and leave you sweltering. These tents may also include lower-quality poles and irregular, mass-production stitching. Their low prices are head-turners, true, but their durability is suspect. These tents may be fine for backyard campouts, but not for long-term trips into the backcountry.

Price: Most outfitters work to accommodate campers with budgets of all kinds. Expedition-quality tents can be very expensive. Most outfitters carry less expensive models that outperform department-store tents and offer budget-minded explorers a quality product at a fair price.

Pole sections: Length is a factor to some people. Shorter sections are handy, making it possible to pack a rolled tent in a more compact spot inside your pack. Long poles often must be carried vertically while strapped to the outside of your pack.

Shape: The most popular shape in tents these days? Domes. Their symmetric design, strength-to-weight ratio and relative ease of assembly has endeared them to the camping and hiking masses. Weight-saving designs, particularly wedges, have also remained popular.

Ground cloths: Many manufacturers are now creating "footprints" for their tents—customized ground cloths tailored to fit specific tent models. Footprints are sized slightly smaller than the tent's floor to prevent pooling of water underneath you during rainy weather. Most come with attachment points that connect them to the tent. Both footprints and traditional ground cloths/tarps help shield a tent's floor from abrasion and, in the morning, offer you a dirt-free place to roll up your tent. It's smart to carry one.

Extras: Look for helpful nuances such as inside wall pockets (very nice to have), gear lofts, factory-sealed seams and convenient vent windows. Roomy vestibules are also nice.

Setup: Practice setting up a new tent before you take it into the backcountry. If you need to seal the seams, you'll have to set it up before your first trip.

Does Everybody Need a Tent?

Some hardy souls will argue that a tent is a burdensome luxury. Ultralight advocates point out that a tarp, a little cord and some ingenuity are all people need to create sufficient shelter in the wilderness.

In many situations, that's a valid point. But then an unexpected overnight weather front blows through, or skeeters arrive by the thousands, or you're not really sure if a nearby ant hill is inactive after all. A night or two like this is usually all it takes to convince most recreational hikers that the full enclosure a backpacking tent provides is worth a little extra bulk and weight in their packs.

Chosen wisely, a tent will add only a modest amount of weight to your load. In return, it will give you the confidence to know you are equipped to take shelter from just about any rude surprise nature may dish out during your trip.

Quick Review

- Tents serve both a physical and psychological function; they protect you from the elements and surround you with a sense of security.
- Anticipate what awaits you in the backcountry—the weather, number of people in your party—and seek out a tent equipped to accommodate your most demanding ambitions.
- General backpacking (three-season) tents are excellent, lightweight performers; winter/mountaineering (four-season) tents are good year-round and give you extra stability during harsh conditions.

How to Choose a Bivy Sack

Ultralight camping equipment is growing ultra-sophisticated. Nowhere is that trend more apparent than in the evolving category of solo shelter systems, more commonly known as bivy sacks.

If you are unfamiliar with the expanded number of bivy options in circulation, take a look. You'll be impressed by the variety of choices and intelligent designs available to independent adventurers who are determined to keep their loads as light as possible.

Who uses bivy sacks? People who:

- Frequently travel solo in the backcountry.
- Climb big-wall routes that require more than a day to complete.
- Camp during long-distance biking trips.
- Seriously desire to shed every possible ounce from their loads.
- Don't mind sleeping in snug spaces.

Bivy Basics

Bivy sack is short for "bivouac sack." It originated as an invention to serve the needs of climbers who wanted lightweight emergency weather protection for sleeping bags during multiple-day ascents, particularly on big walls.

Early bivy sacks were little more than waterproofed nylon slipcovers for sleeping bags—good for keeping sleeping bags shielded from rain, not so good when ventilating vapor produced by body heat.

Bivy design today involves 2 tiers of fabric. The **bottom tier** typically consists of a durable grade of nylon (usually taffeta, sometimes oxford) that is coated with urethane to make it waterproof. This is the same material used for most tent floors.

The **top tier** is usually made of ripstop nylon (a lighter fabric) and treated with a waterproof/breathable laminate such as Gore-Tex®, Tegraltex or REI Elements®. Multiple layers of a laminate are often applied for durability and performance.

Over time, the original bivy spawned a sister product with tentlike characteristics, the **bivy shelter**. For an extra pound or so, a bivy shelter adds 2 features not available with traditional bivies— an expanded area of shielded headspace and a full enclosure to block out bad weather and insects. These extras have helped bivy shelters grow in popularity with nonclimbers, particularly ultralight hikers.

In addition, a bivy-inspired subcategory of **2-walled tents** has emerged. The average weight of these streamlined tents (about 4 pounds) is heavier than a standard bivy (2 pounds or less), yet they offer more interior wiggle room at a modest weight—a comforting fact for soloists who like a little sit-up space in their shelter but want to travel light. Examples: REI Sololite; Kelty Clark Tent; Walrus Micro Swift; Sierra Designs Clip Flashlight.

Bivy Sacks

Even when designed with modern fabrics, a traditional bivy sack is intended primarily for mountaineers or committed minimalists—people who drill holes in their spoons to save a few fragments of an ounce.

A basic bivy performs 2 basic functions: It keeps a camper's sleeping bag dry and increases its warming capacity by approximately 10 degrees.

A bivy sack includes an opening for your head. When rain falls, some moisture can potentially find its way inside via the unshielded head opening. A camper can minimize that risk by pulling the headhole's drawstring very snuggly. Doing so, of course, turns the headhole into more of a nosehole, which some people find far too restrictive. Yet this is a small sacrifice to ultralight travelers who prize a bivy's next-to-nothing weight.

Additional bivy considerations:

- Some models make it possible to create armholes on the side of a bivy, allowing you to sort gear or cook while you are protected and warmed inside the shelter.
- Full-length zippers are nice features, giving you more options for ventilation.
- Look for factory-sealed seams; top brands now routinely offer this desirable feature.
- Some models include straps for securing your sleeping pad in place.
- In warm conditions, people sometimes skip a sleeping bag altogether and simply sleep inside the bivy shell.

Examples of a basic bivy: Moonstone Personal Shelter; Standard Bivy by Outdoor Research; REI Cyclops.

Bivy Shelters

Bivy sack evolution has led to a category of low-rise tents known as bivy shelters. These models include mesh panels attached to the head opening, plus small suspension systems (poles, hoops or stiffened wires) that lift fabric off a camper's face. In a bivy shelter, it is possible to achieve full enclosure and shut out bugs and rain. This requires a little resourceful venting during a downpour, but it can be done.

For many go-light long-haul backpackers, a bivy shelter's fortified wedge of head space provides just enough of a comfort zone to make a bivy's restricted air space seem acceptable. In areas of persistent rain, bivy shelters lose some of their appeal; it can be tough to wait out a storm inside a shelter that offers no sit-up space. Yet bivy shelters make a lot of sense in areas blessed with benign weather, such as the Sierra Nevada. Examples: Integral Designs' Unishelter; Advanced Bivy Sack by Outdoor Research.

Bivy Considerations

Is a bivy too tight for you? Initially, you might initially think so. But don't dismiss this style of shelter too quickly. A tent offers campers a roomier, secure, roof-over-your-head sensation, no question. A bivy, though, minimizes any sensory/emotional separation between you and the outdoors. It's almost like sleeping under the stars—a very liberating experience. At the same time, you are protected by an adequate—and very lightweight—barrier that shields you from nature's less desirable elements, like bugs and raindrops. However, if tight spaces make you uneasy, you are likely to feel uncomfortable inside a bivy, particularly during bad weather. In that case, move up to a tent.

How does air circulate inside a bivy? Breathable/waterproof laminates such as Gore-Tex fabric make it possible for vapor produced by body heat to be pushed through (and out of) the fabric. Raindrops, meanwhile, are repelled. A breathable/waterproof bivy works best in situations where a warm, humid

body is resting somewhere cool and dry. In rainy conditions, though, modern bivies are designed with enough overlapping material and zippers that it is unlikely you will have to completely zip them shut. Manually venting a zipper or flap helps maintain an acceptable interior humidity level.

Can condensation be a factor with a bivy? Potentially, yes. A bivy is basically a single-wall tent. When warmed vapor escapes from your body or lungs, it rises to meet colder air. When the vapor makes contact with the laminated bivy fabric, air can no long carry all the moisture, so some collects on the inside of the treated fabric. In 2-walled tents, this moisture passes through the breathable tent canopy and settles on the rainfly. With a bivy, though, this can produce a slight amount of dampness on its inner wall. In icy conditions, this could lead to a thin layer of frost on the inside.

Will a bivy really keep a sleeping bag dry? When wet, Gore-Tex fabric sometimes produces a clammy feeling when it touches your skin, but it's just that—a sensation, not a soak-through. Good ventilation helps minimize this condition, and many wilderness travelers regard this as an acceptable inconvenience when measured against a bivy's minimal weight.

Quick Review

Bivy sacks: Well-suited for mountaineers and minimalist-minded adventurers who take short-term (1- and 2-day) trips. Requires a mindset that adapts well to Spartan situations.

Bivy shelters: Popular with ultralight long-distance backpackers and touring cyclists. A good choice for people who explore in areas of infrequent rain. Extra headroom and full enclosure make them more acceptable to recreational explorers who can mentally adapt to spending nights in a compact space. Snug but light.

Compact tents: Some models in the 4-pound range offer a blend of spaciousness and modest weight; in many cases, the preferred choice for recreational explorers.

How to Choose a Sleeping Bag

On a cool evening in an unfamiliar place, a good sleeping bag seems to work like magic. Slip inside one after a few post-sundown shivers have rattled your body and, within minutes, the chill in your bones is replaced by a warm glow. It's a sweet sensation that assures you of a comfortable night's sleep.

Here are some tips to help you make a smart choice when selecting your own sleeping bag.

QUICK READ

1. Match your bag's comfort rating with the coldest nighttime temperatures you expect to encounter—and maybe even exceed that number for little security.
2. Bags using down insulation are lighter (providing a higher "warmth-to-weight" ratio) than bags using synthetic fill. They also compress into smaller shapes and last longer.
3. Synthetic-fill bags can provide some insulation even when wet, and they dry out fairly quickly. Plus, for the same temperature rating, they cost less than down bags.
4. A bag's shape matters. Mummy-style bags insulate most effectively and are your best choice for colder, high-elevation conditions; rectangular bags give you more room to change sleeping positions but offer more space that your body must heat up.
5. A good sleeping pad is essential. Your body weight compresses a bag's insulation when you lie on it, so you need a reliable buffer between, your bag and the cold ground.

How Do Sleeping Bags Work?

Sleeping bags keep you warm by trapping and holding a layer of "dead" (non-circulating) air next to your body. This air, which is warmed by your body heat, forms a barrier between you and colder air or cold surfaces.

When evaluating bags, consider these key factors:

- Comfort rating
- Insulation (down or synthetic fill)
- Weight
- Size when compacted
- Shape
- Personal sleeping tendencies (are you, for example, a "cold sleeper"?)

Comfort Rating

A sleeping bag's temperature or "comfort" rating identifies the most extreme temperature the bag is designed to accommodate. When you hear a bag described as a "+20 bag," it suggests most users should remain comfortable if the air temperature drops no lower than 20 degrees Fahrenheit.

Are such ratings infallible? No. Humans all have different metabolic rates, and no industry standards exist that uniformly determine sleeping bag comfort ratings. Instead, each manufacturer assigns a rating to its bags based on its own research. Therefore, use these numbers as a guide, not a guarantee. If you have trouble deciding between two bags, it's not a bad idea to select one that offers a little more warmth than you think you might need.

Many factors affect your ability to keep warm inside a sleeping bag:

- The insulating **pad** beneath your bag (when sleeping on frosty ground at high elevation, you need a full-length pad to keep you separated from the cold; when sleeping on snow or frozen ground, two pads are recommended)
- The presence/absence of a **tent** (a tent or bivy shelter traps an extra layer of dead air, warming it by up to 10 degrees)
- Your **metabolism**; you might be a "cold sleeper" (and thus one who prefers extra insulation when sleeping) or a "warm sleeper" (someone who kicks the covers off at home)
- Your **gender** (women frequently prefer bags with lower temperature ratings since they tend to "sleep colder" than men)
- **Clothing** worn while inside the bag (dry long underwear and clean socks are good choices on cold nights, plus they help keep body oils off your bag; a cap and neck gaiter keeps body heat from radiating away; fleece pants and jackets help on colder-than-expected evenings)
- **Adjustments** you make while in the bag (keep the bag zipped up and the hood cinched on cold nights; be careful to not breathe into the bag, since moisture has a negative effect on the insulation)
- **Food** in your stomach (the process of digestion helps produce warmth)
- **Hydration** (if you're not well hydrated the food won't help much)

Even experienced campers and backpackers can be surprised by unexpectedly cold overnight conditions, particularly during trips in the spring and fall. It's smart to be prepared.

Tip—To be ready for those extra chilly nights, select a bag with a temperature rating that slightly exceeds the low end of the temperature range you expect to experience. If a +20° F bag sounds right for you, a +10° bag would probably work well, too. On warm nights, you can always vent a bag (by using the double zipper to open the area near your legs) or simply drape it over you, unzipped. It never hurts to be a little over-prepared.

Recognizing that comfort ratings are merely general guides, many outfitter organize sleeping bags in the following categories:

Bag Type	Comfort Rating (°F)
Summer Season	+35° and higher
3-Season Bag	+10° to +35°
Cold Weather	-10° to +10°
Winter/Extreme	-10° and lower

Please note: Even in summer, a +35° bag may leave you feeling chilly when sleeping in the high country. If you think of yourself exclusively as a warm-weather camper, yet plan to routinely camp at higher elevations (3,000 feet and up), choose a bag with a comfort rating at least in the 20s.

Down or Synthetic Insulation?

The insulation or "fill" inside a sleeping bag largely determines a sleeping bag's:

- Weight (and thus its "warmth-for-weight" ratio)
- Compressibility
- Durability

Down
Down is the wispy, fluffy undercoating found just beneath the outer feathers of geese and ducks. This natural fiber is an extraordinary insulator. Goose down is preferred to down from ducks, prized because it is believed its plumes offer a higher "fillpower" (explained below).

Down's positives include:

- It offers tremendous warmth for surprisingly little weight (thus offering a superior "warmth-to-weight" ratio).
- It can be compacted into very small sizes.
- Its effectiveness outperforms synthetic insulation by years—even decades.

Down, though, does have a *down*side:

- If it gets wet, it is of no value until it dries—and in the field, that can take a long time.
- It is more expensive (keep in mind, though, that its resistance to deterioration makes it an outstanding long-term value).

Down is graded according to fill power—meaning the number of cubic inches one ounce of down will displace. The higher the number, the better the insulation.

Synthetic Materials
Synthetic materials are basically plastic threads (extruded polymers, to be technical). The threads are most commonly a continuous filament (a long, single strand). They can also be arranged in short "staples" up to four inches long. Usually the threads are hollow, reducing their weight and enabling them to trap more air.

The advantages of synthetic fill include:

- It still provides some insulation when wet; plus it dries fairly quickly.
- It's less expensive than down.
- It's non-allergenic.

The shortcomings of synthetic fill are:

- It's bulkier than down (so it takes up more space when you're carrying it).
- It's heavier (it takes more weight to get the same warmth down provides).
- The filaments gradually degrade over time.
- The insulating "batts" of filaments are stiffer than down and do not drape over the contours of your body as effectively.

Which is Right for You?
Down works well for just about everyone except people who frequently find themselves in rainy conditions.

Synthetic insulation is a good choice for kids and newcomers to camping and backpacking. It costs less than down and dries out relatively quickly if it gets wet.

Many women's bags are cut to accommodate a woman's body shape and preference for extra insulation.

Down always wins in terms of weight, compressibility, warmth and durability. Yet the value and performance of synthetic bags makes them very popular. Synthetic bags are improving each new model year, and they're champs when rain is a threat or cost is a factor.

What about length? Do you need a "regular" or "long" model? The general rule is as follows: If you are no taller than 6 feet, choose a "regular" length bag. If you are up to 6-feet-6, you want a "long" bag.

How to Choose the Right Sleeping Pad

Sleeping pads perform two important functions -- first, they keep you comfortable when you're sleeping on hard, uneven ground. Second, they provide an important layer of insulation between you and the ground (to cut down on conductive heat loss).

How do they work?
Sleeping pads insulate the same way that sleeping bags and clothing layers do. They trap and hold a layer of dead (non-circulating) air between your body and the cold (in this case, the cold ground). Your body gradually warms this layer of dead air and it becomes an insulating barrier.
The insulative performance of a pad depends upon how much air it holds inside and how free that air is to circulate.

Step #1: Consider Your Plans

The primary variables to consider when choosing a pad are:

- Insulation
- Comfort
- Weight/Bulkiness
- Durability

To decide which of these variables are most important to you, consider your outdoor plans. Think about:

- **The kinds of weather you expect** - if you're a fair-weather camper/backpacker, comfort will probably be more important than insulation. But if you hit the trail year-round or enjoy early spring or late fall trips, make sure you get a pad that provides protection from cold and wet conditions. It is recommended that you use two pads in snow or frozen conditions.
- **The level of comfort you want while sleeping** - some people prefer to save money, space and weight by sticking with very basic pads. Other prefer to spend (and carry) a little more to stay as comfortable as possible in the wilderness.
- **How much extra weight you want to carry with you** - Thicker, more comfortable pads can be heavy, which can cause problems on long backpacking trips. But if your trips are short or you're a car camper, weight will be less of an issue.
- **How much space you have for storage** - If you're backpacking with a full gear load, a light, compact sleeping pad will be far easier to pack. Space will be less of a problem if you're carrying all of your gear in your car, or boat.

Step #3: Consider Your Options

- **Air mattresses** - basic, inflatable air bladders

  Positives - They're comfortable, adjustable and inexpensive.
  Negatives - They tend to be heavy, bulky and they can be punctured/ripped easily. Air inside is free to circulate, so they tend to be poor insulators.

- **Open-cell foam pads** - sponge-like foam pads made up of tiny, open air cells

  Positives - They're comfortable, lightweight and inexpensive. The tiny foam cells restrict air circulation, so they are also more effective insulators than air mattresses.
  Negatives - Open-cell foam is absorbent, which can cause problems in wet conditions. It's also

less insulating than closed-cell foam (it must be cut about four times as thick to get the same insulation). Open-cell foam tends to be bulky, difficult to compress (for packing) and not very durable.

- **Closed-cell foam pads** - pads made out of dense foam filled with tiny closed air cells

  Positives - They're cheap, durable (won't pop when tromped on) and extremely insulative (almost no circulation of air in pad, so they can be cut thin yet still provide good insulation). Closed-cell foam is also non-absorbent.
  Negatives - They're relatively stiff and firm, with far less cushioning than open-cell foam (so you'll need a thicker, heavier piece to be as comfortable).

- **Self-inflating pads** - open-cell foam pads wrapped in air-tight, waterproof nylon shells.

  Positives - They're as comfortable as open-cell foam, but much more insulating (the nylon shell limits air circulation, while also protecting against water absorption). They're adjustable (built-in air valves let you control the amount of air inside and thus the firmness of the pad) and they're extremely compact when rolled up.
  Negatives - They're more expensive than the options listed above. Can be punctured or ripped (though field repairs are not difficult). Heavier than open- or closed-cell pads.

Step #4: Try Before You Buy

Sleeping pads come in a variety of styles, shapes and lengths. If possible, try out a number of different pads before deciding on a single model. This will help you get a feel for:

- How much cushioning you need to be comfortable
- How long and/or wide you want your pad to be (many models are cut short to save weight and packing space)
- How easy the pad is to inflate, deflate, and/or pack away

Step #5: Consider the Extras

Finally, consider any extra pad features that might affect your decision -- like multiple air chambers (for a more custom adjustment), built-in pillows (for comfort), textured pad surfaces (for better insulation, less slip and more comfort) and tapered pad shapes that cut down on weight and bulk.

If you'll be traveling with a close friend, consider pads that can be attached together to form a larger sleeping area for two. Also, chair kits that work with inflatable pads offer a great deal of comfort without a lot of weight and bulk.

Caring for Your Sleeping Bag

Protect your investment. With some care and cleaning know-how, you can keep your valuable sleeping bag in top condition for many camping seasons to come.

1. Keep your sleeping bag clean by using a liner or wearing clean clothing to bed. This prevents the need for washing which can decrease the bag's loft.
2. Hand-washing is the preferred method of washing both down and synthetic sleeping bags. Use a mild soap, as detergents can leave a residue. Never dry-clean your bag.
3. Make sure your bag is completely dry before storing. Place it loosely in a large cotton storage bag, hang it, or store it flat. Don't store it in a stuff sack as this will break down the insulation.

On the Trail

An Ounce of Prevention
Keeping your sleeping bag clean and dry while you're out on the trail can go a long way towards extending its life and keeping you warm. Accumulated body oils, sweat and dirt can rob your sleeping bag of its insulating power. Keep them away from your bag by sleeping in clean, long underwear, socks and a hat. If it's warm out, wear clean cotton clothes to bed. Just don't fall into bed in the same clothes you hiked in. You'll drag dirt into the bag with you, and you're likely to sleep colder because of accumulated perspiration in the clothes (even if they feel dry). And never sleep in the clothes you cooked and ate in. This is extremely important in bear country!

If bundling up in lots of clothing sounds too restrictive, you might consider using a sleeping bag liner. Typically made of cotton or polyester, liners add very little weight to your pack and keep your bag clean and sweet-smelling. Plus, they add about 5° F to 15° F to your bag's comfort rating. At the end of each trip, wash the liner and you're good to go again.

Airing out your sleeping bag each day of your trip will help keep it dry and lofty. Even if you have to wait till midday to do so, turn it inside-out and try to expose it to sunlight and a good breeze, if there is one. This will dry out any moisture and help remove perspiration from the night before. It's not a good idea to leave a bag in direct sunlight for very long, as UV light slowly degrades the fabric. However, if your bag gets really wet, it may be necessary to drape it over a rock or bush in direct sunlight for several hours.

The Right Stuff
Your sleeping bag is made to be stuffed over and over without damage. But taking care how you do it will add to its lifespan. Using a larger stuff sack will make stuffing easier, and you can still pack around the stuff sack inside your backpack.

Compression stuff sacks are easy to stuff and save space in your pack. Never leave your bag in a compression stuff sack for an extended period, however, as it will reduce the loft. For easier stuffing, start with the foot first and the zipper at least partially closed. Push the bag firmly into the bottom of the stuff sack and stuff evenly as you go up. This also puts even stress on the stitching. You can keep your bag dry while you're on the trail by lining a nylon stuff sack with a plastic garbage bag and then stuffing the sleeping bag in it. Or use a waterproof stuff sack.

Between Trips

Spot Cleaning
Any time you wash a sleeping bag, you subject it to wear and tear and decrease the loft a little. Spot cleaning the shell with a paste of laundry detergent, water and a toothbrush is advised before washing the whole thing. This is especially true around the hood and collar where hair and skin oils tend to accumulate. By holding the shell or liner fabric away from the insulation, you can wash and rinse the area without getting the inside wet.

However, if you find that your bag is losing loft, is darkened with grime and basically no longer inhabitable unless you wash it, then by all means do so! At this point, washing will actually help restore the loft, and your tent mates and innocent forest creatures will probably thank you for it, too.

Washing
Many people prefer to have their bag professionally laundered. REI offers such a bag-laundering service. Call REI's Seattle store, (888) 873-1938, or Denver Store, (303) 756-3100, and ask for Repair Services for details. **Note:** Dry cleaning is not appropriate for sleeping bags, especially down. Solvents used in dry cleaning can strip the natural oils from down that help it retain loft. Solvents are also very difficult to remove from synthetic insulation.

If you decide to wash your bag yourself, use a gentle, non-detergent soap such as Ivory Flakes, Nikwax Down Wash or Loft II made for washing down- and synthetic-filled items.

- **Down**

For down bags, hand-washing in a bathtub works best. Fill the tub with warm water and add one of the above-recommended cleaners. Put the bag in and gently work in the soap, then allow it to soak for 15 minutes. Drain the tub and press out any remaining water. In a cold-water rinse, work the soap out gently, let the bag sit for 15 minutes and drain. Press out any remaining water. Repeat the rinse until all the soap is out. It's also possible, (according to some bag manufacturers) to machine wash a down bag, as long as a **front-loading** washer is used. Never use an agitator-style machine as the motion can damage the stitching and insulation. Make sure to wash on the gentle cycle in cool water with one of the aforementioned down soaps.

- **Synthetics**

Synthetic bags can be washed in the same way. Hand-wash in a bathtub, or use a large, front-loading washer with no agitator. Use cool water and mild soap. Rinse several times to make sure all the soap is removed. An extra spin cycle or an extractor may be used to remove excess water.

Drying
Air drying is the safest way to dry your bag, but obviously the longest. If you tumble dry your bag, use very low heat or a no-heat setting and keep an eye on it. Dryers have varying heat outputs, so you need to check periodically to make sure the shell and insulation aren't overheating, which can actually lead to melting. Add a couple of clean tennis balls when the bag is nearly dry. This will help break up any clumps of insulation and help restore the loft.

Storage
How you store your bag between trips affects its life span. When you arrive home from a trip, first air out the bag inside-out for a couple days to make sure it's dry. Then store either in a pillow case or a large cotton storage sack—often included when you purchase a sleeping bag, but also available separately.

Do NOT store your bag compressed in its stuff sack as this will eventually suck the life out of the loft. Watertight storage bags are also a bad idea. Condensation can build up inside them and result in mildew. In short, allow your bag come to its full loft with plenty of cool, dry ventilation, and all will be good.

Other Sleeping Bag Tips

Restoring DWR
The original DWR (durable water repellent) finish on a sleeping bag's shell eventually wears off. You can restore water repellency and help keep the bag cleaner if you reapply this finish. There are several products available to restore the DWR to your sleeping bag shell fabric.

Leaking Down
Many, but not all, goose-down bags feature "down-proof" liners and shells made of very tightly woven fabric which prevent the down from getting through. If a few feathers escape through the shell or liner of your bag, don't become too concerned. This is normal, especially along the seams. The sharp quills of the feathers may poke through, especially when the bag is new and the down hasn't totally settled. Work the feathers gently back inside, pulling from the opposite side; the holes should be minimal and close back up.

Fabric Tears
For small holes or tears in the sleeping bag shell, a patch of nylon repair tape will do the trick until you get home.

Broken Zipper
Many outfitters have repair services. Contact the outfitter that sold you your bag and ask them for advice.

How to Choose the Right Backpacking Clothing

The clothes you bring with you on a backpacking trip must perform two important jobs. First, they must protect you from the elements (rain, snow, and wind). Second, they must keep you comfortable during a variety of activities and weather conditions.

The best way to choose backpacking clothing is to build a "system" of clothing layers that can be mixed and matched to handle different trips and different conditions.

Some Basic Definitions

- **Layering**
  Layering is the practice of dressing in a number of lightweight clothing layers instead of 1 or 2 heavier layers. Layered clothing systems are versatile (you can add or remove layers in response to changing conditions) and efficient (a number of thin layers will be warmer than 1 or 2 thick layers, and they'll take up less room in your pack).
- **Wicking**
  Certain clothing layers enhance comfort by pulling sweat from the surface of your skin and transferring it into other clothing layers. This process, called wicking, keeps you dry and comfortable in warm conditions. It also keeps you warmer in cold conditions by reducing evaporative and conductive heat loss.
- **Breathability**
  To stay comfortable when temperatures rise or your activity-level increases, you need clothing layers that let your sweat and body heat escape. A garment's ability to do this is referred to as its breathability. Breathability is affected by the materials that a clothing layer is made out of and the design of the layer itself.

Step #1: Consider the Layers You'll Need

Backpacking clothing can be grouped into 4 basic categories: inner layer, mid layer, insulation layer and outer layer. Each type performs a specific task within a clothing system. Whether or not you need them depends on your backpacking plans.

- **Inner layers**
  Inner layer clothing is worn right next to your skin. Its job is to keep you comfortable by wicking the sweat from your skin and providing an extra layer of insulation. Inner layer clothing is usually worn in moderate to cold conditions when a little extra insulation is needed and the chance of aerobic activity is high. It's available in a variety of thicknesses for different activities and weather conditions.
- **Mid layers**
  Mid layer clothing consists of the items you use every day: shorts, T-shirts, lightweight pants and long-sleeve shirts. The primary function of mid-layer clothing is to provide basic insulation and protection in warm conditions. Mid layer items are often worn alone on short trips in good weather conditions. The pieces you choose should be comfortable, lightweight and built to last.
- **Insulation layers**
  Insulation layer clothing is designed specifically to provide additional warmth. It's typically worn whenever mid layer and/or inner layer pieces are not warm enough for the current conditions. The insulation layers you use should be warm, lightweight and as non-bulky as possible. They should also breathe well to let sweat and body heat escape.

- **Outer layers**
  The primary job of outer layer clothing (both tops and bottoms) is to protect you from the wind, rain and snow. But it needs to be somewhat breathable as well, to let sweat and body heat escape. Backpackers should always carry protective outer layers.

Step #3: Consider Your Fabric Options

Inner Layers

- **Cotton** - Cotton is comfortable when it's dry, but it absorbs sweat and holds it right next to your skin (which can lead to significant heat loss). Cotton also takes a long time to dry, which can cause discomfort. For these reasons, cotton is not recommended for inner layers used in cold conditions.
- **Silk** - Silk is an effective wicking and insulating material. It's extremely comfortable and lightweight, but not as durable as the options below. Some silk layers require special care when washing and drying.
- **Polypropylene** - One of the very first man-made wicking materials, Polypro wicks sweat away from the skin effectively. Early versions tended to retain odors and become scratchy after repeated washings. Newer Polypro fabrics have overcome these difficulties.
- **MTS 2**® (Moisture Transport System) - MTS 2 is a durable, reliable polyester-based fabric that wicks sweat like polypropylene--without its drawbacks. It's comfortable like cotton, and it's available in a variety of "weights" for different conditions.
- **Capilene**® - Capilene is another comfortable, reliable polyester-based wicking fabric. It performs like MTS 2®, with a special chemical treatment to help spread sweat throughout the fabric so that it evaporates quickly.

Mid Layers

- **Cotton** - Cotton is a common choice for warm-weather backpacking clothing. It's comfortable, lightweight and it keeps you cool. Cotton is best for warm weather uses because it takes a long time to dry and is an ineffective insulator.
- **Nylon** - Lightweight, durable and (generally) non-absorbent, nylon is great for backpacking shorts, pants and shirts. It is available in a variety of styles, for both warm and cold weather uses. Most modern nylons are soft and comfortable against your skin.
- **Wicking materials** - Some backpackers wear wicking inner layers like MTS 2® and Capilene® as mid layers. Why not? These layers help you keep dry and comfortable and they provide good insulation.
- **Wool** - A great natural insulator, wool is perfect for moderate- to cold-weather backpacking clothes. It's available in full-sleeve shirts, pants, over-shirts, sweaters, jackets and more. Wool insulates well when wet but it can be somewhat scratchy and/or bulky.

Insulation Layers

- **Wool** - Wool is a great natural insulator. It's available in knickers, pants, long-sleeve shirts, pullovers, sweaters and jackets. It insulates when wet but can take a long time to dry. Can be heavy/bulky.
- **Pile/Fleece** - These popular man-made insulation materials are available in a wide variety of styles and thicknesses. They are comfortable, warm (even when wet), fast drying and lightweight (half as heavy as wool). Pile/fleece products are available in shirts, pants, vests, jackets, pullovers and sweaters. Traditionally, pile/fleece layers have provided only minimal protection

from the wind. But new pile/fleece garments are available today with wind- and weather-stopping liners built right in.

Outer Layers

Outer layer clothing can be divided into 3 basic categories (see below). Each has it's own set of characteristics, and each protects backpackers from precipitation, wind and sweat build-up to different degrees. To choose the right outer layer clothing, focus on the general category that sounds best for your needs. Then consider the design features listed at the end of this section to choose a specific model.

- **Water-resistant/breathable fabrics** (e.g., REI Windpack outerwear)
    - **Positives:** These repel wind and light precipitation while providing excellent breathability. They tend to be less expensive than other options.
    - **Negatives:** They are not waterproof enough to protect you in harsh weather conditions or extended periods of rain.
    - **Typical Uses** - Water-resistant/breathable fabrics are perfect for backpackers who travel in arid and/or warm conditions where good breathability is important and the chance of heavy precipitation is low. They are popular among backpackers who plan short trips in good weather and those who enjoy strenuous activities like trail running.

- **Waterproof/Non-Breathable Fabrics** (e.g., Columbia Sportswear Ibex rainwear)
    - **Positives:** These are completely waterproof, and they're less expensive than waterproof/breathable fabrics.
    - **Negatives:** They provide very little breathability, which can be extremely uncomfortable it's hot or if you're working hard on the trail. To let moisture out, layers using waterproof/non-breathable fabrics have to be cut extremely loose (like ponchos) or they must have special vents or openings built in to let the heat and sweat out.
    - **Typical Uses** - Because of the lack of breathability, most backpackers stay away from waterproof/non-breathable outer layers (unless temperatures are very low or the chances of heavy precipitation are very high). They are used occasionally in moderate conditions in inexpensive rain pants and emergency ponchos.

- **Waterproof/Breathable Fabrics** (e.g., REI Elements®, Gore-Tex®)
    - **Positives:** These fabrics are both waterproof and breathable (to a degree). They are good performers in a wide range of weather conditions.
    - **Negatives:** Even waterproof/breathable fabrics heat up and trap sweat during strenuous backpacking. Exact performance depends on the specific type of fabric used, the outside temperature, the amount of activity and other factors. Waterproof/breathable fabrics are more expensive than other types of outerwear.
    - **Typical Uses** - More and more wilderness enthusiasts are choosing waterproof/breathable fabrics for their outer layers. These fabrics are comfortable in a wide variety of situations and conditions. And performance levels keep improving all the time.

A Note on Outer Layer Design

There is more to choosing the right outer layers than just deciding on a type of fabric to use. You must also consider the designs features included in different jacket and pant models. When you start comparing different styles head-to-head, consider the following:

- **Fit** - Outer layers should be roomy enough to fit over your clothing layers but snug enough to cinch down tight in nasty conditions. They should also allow for a full range of motion.
- **Access** - Full-zip jackets and full-zip pants are easier to get in and out of than pullover tops or pull-on pants. However, more zippers mean a higher chance of leaks.
- **Specific Features** - Specific features can have a significant effect on an outer layer's performance and comfort:
    - **Adjustable Openings** - The waist, cuffs and neck should seal tight for bad weather but open easily for extra ventilation.
    - **Vents** - Vents enhance breathability no matter what type of fabric an outer layer is made of. Larger vents are typically more effective than small ones, but they may leak more. Typical vents include under-arm zips, side zips, mesh-lined pockets and draft flaps.
    - **Pockets** - The more pockets an outer layer has, the easier it will be for you to store essential gear items. But keep in mind that pockets increase the weight of the layer. Pockets should be easy to reach, easy to open and close, and well-protected against leaks.
    - **Hoods** - Any outer layer top you use for backpacking should have a hood to keep your head dry. Integral (permanently attached) hoods offer the best resistance against leaks. Hoods that can be rolled up and/or folded away when not in use are easier to deal with in changing conditions.
    - **Storm Flaps** - Storm flaps cover zippers, pockets and other openings to protect against leaks. They are commonly found on front zippers, under-arm zips and external pockets.
    - **Sealed Seams** - Sealed seams are a must for any waterproof outer layer. They're not necessary for water-resistant ones.

How to Choose Rainwear

Your outer shell does more than keep off rain. Rainwear also protects you from wind, snow and cold. Different garment styles, fabrics and construction are available to suit a wide variety of needs.

1. Your choice of rainwear depends on expected weather and climate, your planned activities and your budget.
2. The main fabric choices for rainwear are waterproof/breathable, water-resistant/breathable, and waterproof/non-breathable.
3. Waterproof/breathable fabrics, available in different weights, are the most versatile fabrics.
4. Features such as vents, zippers and linings can add to your comfort.
5. Other considerations include a garment's style and cut, plus how well it packs.

Consider Your Needs

Choose rainwear appropriate for your outdoor plans. How and where will you be using it? Anticipate the most extreme conditions you might encounter and plan accordingly. Will you be in a canoe, waiting for the fish to bite? Hiking or running a trail? Visiting a rainforest? Skiing or climbing in a snowstorm? Walking around town?

Begin your search for the right rainwear by considering all of the following:

- Temperatures you expect to encounter most often
- Amount and type of precipitation you anticipate
- Types of activities where you'll use your rainwear
- Budget

Consider Fabric Choices

Fabric affects the performance and comfort of your outer layer. Rainwear fabric falls into three basic categories:

- Waterproof/Breathable
- Water-Resistant/Breathable
- Waterproof/Non-Breathable

Waterproof/Breathable
Because water vapor is able to pass through the fabric, waterproof/breathable shells are appropriate for the widest range of activities and weather conditions. Such fabrics are not 100 percent waterproof or perfectly breathable, but they do an impressive job of repelling water while allowing water vapor to escape as you work up a sweat.

Typical Uses—Waterproof/breathable fabric can be found in a variety of garments—technical parkas for skiing and mountaineering, more casual rainwear for hiking or around-town use.

Positives—Waterproof/breathable layers are an excellent choice for a wide range of weather conditions and activities. Their combination of breathability and moisture protection means that you can buy a single layer for everything from summer backpacking to backcountry skiing.

Negatives—Even waterproof/breathable fabrics have their limits. Exact performance depends on the specific type of waterproof/breathable fabric used, the outside temperature, your activity level and other factors. Waterproof/breathable fabrics are more expensive than other types of outerwear.

Examples—There are two types of waterproof/breathable fabrics: laminates and coated fabrics. Both are very effective. A membrane such as Gore-Tex®, REI Elements® or Marmot MemBrain™ is laminated to a base nylon or polyester fabric. Or a waterproof/breathable coating is applied. Coated, waterproof/breathable fabrics include Hydroseal®, Columbia Sportswear Omni Tech Ceramic™ and Lowe Triple Point® Ceramic. All of these fabrics also have a durable water-repellent finish (or DWR) on the outside that causes water to bead up and roll off.

Water Resistant/Breathable
These shells serve as breathable outer layers for mild weather, light precipitation and high activity level. They're made of tightly woven fabrics (such as mini ripstop nylon) that block the wind, and they're also treated with a durable, water-resistant (DWR) outer finish to make water bead and roll off.

Typical Uses—Water-resistant/breathable fabrics are perfect for anyone who needs weather protection during strenuous outdoor activities such as running, cycling or Nordic skiing. They're also appropriate in warm conditions where breathability is important and the chance of heavy precipitation is low.

Positives—Water-resistant/breathable layers repel wind and light precipitation while providing excellent breathability to keep you cool when your body heats up. They tend to be lighter, less bulky and less expensive than other outer layers.

Negatives—They are not adequately weatherproof to protect you in harsh conditions or during extended periods of rain.

Examples—This rainwear is typically made of lightweight polyester or nylon, which is tightly woven to keep out wind and light drizzle while allowing water vapor to escape. The fabrics have a durable water repellent (or DWR) finish that causes water to bead up and roll off before it can be absorbed.

Waterproof/Non-Breathable
Typically made of a durable, polyurethane-coated nylon or PVC, these economical shells are water- and windproof, making them ideal for light activity in heavy precipitation.

Typical Uses—Waterproof/non-breathable layers are most commonly used during low-energy activities and when the chance of heavy precipitation is high. Because they're so affordable, waterproof/non-breathable fabrics are also used occasionally in moderate conditions. Examples include ponchos and vented rain suits.

Positives—Waterproof/non-breathable layers offer the ultimate protection from rain and wind. They are more durable and less expensive than most other outer layer options.

Negatives—Non-breathable layers can get extremely uncomfortable with even moderate exercise and outdoor temperatures. The moisture and heat that your body produces cannot pass through the fabric itself so these layers must be cut extremely loose (ponchos, for instance) or they must have generous

vents to allow body heat and sweat to escape. This type of rainwear is generally heavier and bulkier than other styles.

Examples—PVC and polyurethane-coated nylon jackets, pants and ponchos typically make up this type of rainwear.

Consider Design Features

There's more to choosing rainwear than simply deciding on the right type of fabric. The cut of the garment and features such as vents and zippers also contribute to its overall function. Consider the following when making your rainwear choice:

Parka, Jacket, Anorak or Poncho—Full-zip jackets or parkas are easier to put on and take off than anoraks (pullover jackets). However, more zippers mean a higher risk of leaks. Parkas cover the hips for better overall protection, but shorter-cut jackets typically pack down smaller and provide ample coverage when paired with rain pants. Ponchos are inexpensive, waterproof and allow plenty of ventilation.

Full-Zip or Pull-On Pants—While more expensive than pull-on types, rain pants with full side zippers allow quick changes on the trail, opening wide for boots or shoes. Pull-on rain pants can provide better protection in continued heavy rain. Again, fewer zippers mean fewer chances for leaks. Some feature ankle zips to allow easier changes.

Hoods—Integral (permanently attached) hoods offer the best resistance against leaks. Hoods that can be rolled up or folded away when not in use are less bulky.

Elastic cords with toggles that can adjust the hood around your face can greatly increase comfort and visibility. Some rainwear styles have hoods with stiffened visors, and some even have brims that can be shaped to fit better. Look for adjustment tabs on the back of the hood to allow for better fit and visibility.

Chin Guards—Chin guards are fleece or knit synthetic fabric linings on the inside of the collar that protect your face from zipper abrasion and the cold, wet and frost that can build up from freezing breath.


"Napoleon" pocket

Pockets—The more pockets an outer layer has, the easier it will be for you to store essential gear items. But keep in mind that pockets increase the weight of the layer and can result in more leaks. Pockets should be easy to reach, easy to open and close, and well protected against leaks. Some jackets feature a Napoleon pocket, a vertically zipped pocket that allows you to assume the posture of Napoleon who often posed with his hand inside his jacket. We're not sure about Napoleon's rationale. Today, the pocket is designed to secure small items where they can be easily accessed.

Linings—Free-hanging nylon or polyester linings are often used to protect waterproof/breathable fabrics from wear and tear. Mesh linings weigh less and breathe better than solid linings but don't offer as much protection. Some outer layers (like 3-ply Gore-Tex®) have lining materials that are attached right to the inside face of the outer layer fabric, eliminating the need for

a separate, free-hanging liner. More technical jackets feature moisture-wicking linings for comfort during high-energy activities.

Sealed Seams—Sealed seams are a must for any waterproof outer layer, since they keep water from seeping through sewing holes. Sealed seams are not necessary for water-resistant layers. Some manufacturers, including those making Gore-Tex® garments, seal their seams at the factory. Others recommend that you apply seam sealer at home, although this is not as common as factory sealing.

Vents—Vents enhance a garment's ability to breathe, no matter what type of fabric is used in its construction. The larger the vent, the better the airflow, but the greater the risk of leaks. Typical vents include under-arm zips, mesh-lined chest pockets that double as vents, and mesh shoulder yokes with draft flaps across the upper back.

Storm Flaps—Storm flaps cover zippers, pockets and other openings to protect against leaks. They are commonly found on front zippers, underarm zips, full-zip pants and external pockets.

Technical Design Features
Some rainwear is specifically designed for alpine sports or cold, wet conditions. Look for the following if your planned activities include climbing, mountaineering, skiing or snowshoeing:

- **Fabric Reinforcements**—prevent wear and tear at the seat, knees, elbows or shoulders from pack straps or contact with rocks or snow.
- **Articulated Elbows and Knees**—allow excellent range of motion.
- **Scuff Guards**—protect fabric on the inside edges of pant legs from skis or crampons.
- **Longer Sleeves**—keep arms covered while reaching with climbing tools.
- **Shorter Hems**—allow easy access to the climbing harness.
- **Drawcord Hem or Powder Skirt**—seals out wind, snow and rain.

How to Choose the Right Cookware

Step #1: Consider the Trips You have Planned

Short trips and simple menus will require the basics only (see below). Longer journeys and bigger groups will likely require more.

The basics (per person)

- Single pot, with a lid that can double as a plate
- Cup
- Basic utensils (spoon and knife)
- Some way to pick the pot up (either a handle, bail or pot-grabber)

Step #2: Decide Between a Cook Set or Individual Pieces

Collecting your cookware and utensils piece by piece gives you the freedom to choose exactly what you want. You can use items from home, borrow pieces from friends or even raid garage sales.

But purchasing a backpacking cook set will save you space, weight and time. Cook sets (specially designed collections of pots, pans and lids) are designed to "nest" together so the entire set takes up only the space of the largest pot. Many are also designed so stoves (and other utensils) fit inside for even more space efficiency. Because they're designed specifically for outdoor uses like backpacking, most cook sets are made of lightweight, durable materials that weigh very little but last season after season.

Step #3: Consider the Material Options

- **Aluminum**
  Positives - Lightweight, affordable, a good conductor of heat. Good for simmering foods without scorching.
  Negatives - Breaks down slowly when exposed to acidic foods. Dents and scratches easily.

- **Stainless steel**
  Positives -Tougher, more scratch-resistant than aluminum. *Negatives* - Heavier than aluminum, doesn't conduct heat as uniformly (can cause hot spots that scorch food).

- **Titanium**
  Positives - Super lightweight, extremely tough. A must if weight is your number one concern.
  Negatives - More expensive than other options. Conducts heat less evenly than stainless steel.

- **Non-stick coatings (Available on some metal cookware)**
  Positives -- Make clean up a breeze.
  Negatives -- Less durable than regular metal surfaces. Most can be scratched by metal utensils.

- **Plastic**
  Positives -- Lightweight, cheap, non-abrasive. Perfect for utensils and air-tight food containers.
  Negatives -- Not as durable or heat-resistant as metal. Some plastics can pick up and retain food flavors/odors.

Step #4: Focus on the Important Variables

- **Pot size** - The largest pot in your cook set should hold approximately one pint per backpacker. Smaller pots should fit snugly inside the largest one.
- **Number of pots** - One pot is usually fine for 1 or 2 people (especially if the lid doubles as a plate). A three-pot set should be enough for groups up to 5 people, unless you have complex meals planned.
- **Lids** - Lids cut down on cooking time and save fuel. They can also be used as plates or even frying pans. Make sure your lids fit your pots snugly and that they're easy to pick up. You should have one lid for every pot in your set (or one that fits multiple pots).
- **Lifters** - Make sure you have some way to pick up your pots and pans. Wire bails and collapsible handles are convenient, but they can break and/or get too hot to touch. Pot-grabbers are durable and easy to use. But you have to remember to pack them!
- **The extras** - Some cook sets come complete with "extra" pieces (cups, basic utensils, plates). Ask yourself if you really need them, and keep in mind that many of these extras can also be purchased separately, often at a lower price.

A note on utensils
When it comes to utensils, minimalist backpackers often make do with nothing more than a knife, spoon and a pot scrubber for clean up. But everything from garlic presses to miniature espresso makers are available these days, if you care to treat yourself and bring them along. The utensils and "extra" cookware you carry with you should match your tastes and your menu. Many outfitters carry a wide variety of cookware extras to spice up your backcountry kitchen, including:

- **Utensils** - Spatulas, serving spoons, whisks
- **Extras** - Frying pans, coffee/tea pots, backcountry ovens, espresso makers, spice containers, squeeze bottles

Understanding Water Treatment

You just don't know.

The water tumbling along in a clear-flowing mountain stream could be some of the cleanest, purest water on earth. Or it may carry a stray microscopic pest that, if it finds its way into your intestines, could leave you weak, nauseous, cramped, bloated or vulnerable to diarrhea and vomiting for weeks.

It's a fact of modern wilderness life: Any backcountry water source, no matter how high or remote, is susceptible to contamination due to unsanitary practices of the creatures that visit it — from birds and bears to possums and humans. Experienced wilderness travelers recognize the need to play it safe with backcountry water and thus treat every drop before they drink.

What are the risks of drinking water in the backcountry, and how can you protect yourself? Here's an overview:

The Enemies

Whenever animal or human fecal material connects with a water source, it's possible 1 or more pathogenic (disease-causing) microorganisms could invade the water. They fall into 3 categories:

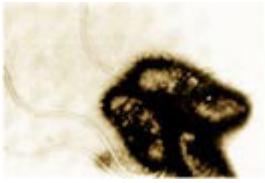
Protozoan cysts — These are hard-shelled, single-cell parasites, including the well-known Giardia lamblia (ranging in size from 5 to 15 microns) and the resilient, lesser-known Cryptosporidium parvum (2 to 5 microns).

- Giardia infection occurs in the small intestine, where cysts "hatch." Symptoms (diarrhea, gas, nausea, cramps) appear within 1 to 2 weeks and last 4 to 6 weeks or longer. Symptoms of crypto (diarrhea, loose stool, cramps, upset stomach, slight fever) appear in 2 to 10 days and typically last 2 weeks.

- Giardiasis can be treated with prescription drugs; so far, cryptosporidiosis cannot. People with weakened immune systems could be at risk for more serious disease, particularly with cryptosporidiosis.

- Cryptosporidia are highly resistant to iodine and chlorine.

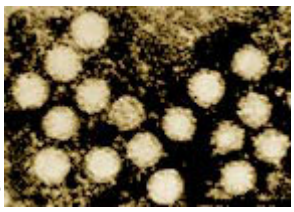
- **Portable filters and purifiers** with fine pores (capable of trapping particles as small as 0.2 or 0.3 microns) **reliably capture** these bugs. Units should have an "absolute pore size" of 1 micron or less. (Absolute pore size indicates the largest possible opening in a filter or purifier's straining element.)



Bacteria — These are smaller organisms, most of them commonly associated with food poisoning: E. coli, salmonella, cholera (common in some developing countries) and others. Campylobacter jejuni has appeared with some regularity in wilderness settings.

- Bacteria range in size from 0.2 to 10 microns. Symptoms of infection (diarrhea is common) may appear within 6 hours or 3 to 5 days out. They may last 4 days or longer. In healthy people, campylobacteriosis symptoms usually vanish within 5 days. Antibiotics could be used if needed.

- **Filters and purifiers** are also **effective** in straining out these organisms.



Viruses — The tiniest (0.004 to 0.1 microns) of organisms. Examples: Hepatitis A, rotavirus, Norwalk virus and polio. (To this point, hantavirus does not appear to be a waterborne disease.) Viruses are the least common pathogens found in the wilderness.

- Viruses that afflict humans usually only reach backcountry water sources via human fecal matter. Animals and humans, meanwhile, are common carriers of protozoa and bacteria.

- Once exposed to the environment, viral particles exhibit a short lifespan and do not reproduce in water as some bacteria do.

- **Viruses can slip through filters** but can be inactivated by boiling, by contacting the chemical component found in purifiers, or by chemical treatment either before or after filtration.

Chemicals and toxins — This fourth category includes agricultural runoff (pesticides, herbicides) and industrial runoff (metals, mine tailings). Some toxic bacteria can spawn algae in warm, shallow water and turn it green.

- Filters that include an activated **carbon** element offer some protection against such materials found in water. If you believe a water source has been tainted by chemicals or toxins, either boil the water (which offers limited benefit) or, better, move on.

A Microscopic World

None of the organic microscopic critters described above is visible to the human eye. All are measured in **microns**.

A **micron** is 1 millionth of a meter, or .0000394 of an inch. A period at the end of a sentence is roughly 500 microns. The unaided human eye cannot see anything smaller than 50 microns. The straining ability of the pores in filters and purifiers is typically measured in microns. Often you will hear friends and salespeople recommend that you seek out a "0.2-micron" filter. In a simplistic way, this is basically sound advice.

Treat Your Water Right

You have 3 options for treating "raw" water found in the backcountry:

Boiling

Boiling water is considered **100 percent effective** against protozoan cysts, nontoxic bacteria and viruses. The Centers for Disease Control and Prevention recommends bringing water to a rolling boil to kill microorganisms in water. At elevations higher than 3,000 feet, the CDC says boiling time should be extended to 3 minutes.

Sounds like the perfect water-treatment solution. Yet some drawbacks exist:

- Boiling **takes time** (stove setup; heating time; waiting time for the water to cool).

- Boiling **drains your fuel supply.**

- **Sediment** in the water is not removed.

  Note: Water boiled for meal preparation needs no additional treatment (chemical or mechanical filtration) before it is combined with a packaged freeze-dried meal.

Still, boiling is an ideal last resort if your filter clogs or you run out of chemical pills.

Chemical Treatment

Exposing water to halogens such as **iodine** or **chlorine** is believed to kill bacteria and viruses, but not all protozoan cysts. Hard-shelled cryptosporidia, as mentioned previously, **show strong resistance to iodine and chlorine.** You should not expect halogens alone to be 100 percent effective against this cryptosporidia.

Note: Some manufacturers and water experts recommend combining chemical treatment with filtration for maximum effectiveness.

While simple and inexpensive, the use of halogens, particularly iodine, includes some additional potential drawbacks:

- Iodized water presents a **taste** some people find objectionable.

- Iodine can be unhealthful for some people, particularly for pregnant women, individuals with thyroid conditions or people who use it for periods of longer than 14 days.

Follow manufacturer instructions closely when using iodine or chlorine. Generally, 2 **iodine tablets** (such as Potable Aqua) purify a quart of water, though 1 tablet can be used to treat a quart at 50°F or warmer (basically, room temperature).

Wait 10-15 minutes for pills to dissolve; very cold water or cloudy water requires a waiting period of 30-60 minutes. Don't introduce powdered drink mixes (to camouflage the taste) until the waiting period is complete. (Potable Aqua offers optional neutralizing tablets.) Water treated by a saturated solution involving **iodine crystals** (from Polar Pure) also requires a 15-minute (or longer) waiting period to assure efficacy.

Adding 2 drops of household laundry bleach to a quart of water can also do the job. The bleach should be 4 to 6 percent sodium hypochlorite and should be soap-free. Some experts recommend first treating "raw" water with chlorine, then filtering it, or filtering first and then adding chlorine. Chlorine is effective against bacteria and viruses.

Mechanical Filtration

Cleansing water via a mechanical process — forcing it through a finely porous internal element housed within a filtering unit — has emerged as the **most popular method** of nonwinter water treatment among wilderness travelers.

Portable **filters** and **purifiers** are compact, hand-pumped units that draw in water via an intake hose and physically strain out solid materials, including fine sediment and most (though not absolutely all) microorganisms.

Filtering water from a lake or stream is a relatively speedy and efficient process, though it is never as fast and easy as turning on a tap back in civilization. Filters and purifiers, in fact, **can sometimes be a chore to operate,** particularly when they show signs of clogging.

When shopping, be mindful of a filter's ratings for **output** and **pump strokes per liter,** and its **"pump force"** (how much oomph it takes to work the pump; beware of high numbers). Ratings are supplied by the manufacturers, so be aware that "your numbers may vary." Prices range from $35 to $250.

If portability and speed are not a factor, you have another option to consider: a gravity-fed **"drip" filter**. Here you pour water into a large reservoir, then let it slowly trickle through one (or more) filters to remove protozoa and bacteria. Such units are a good choice for car camping in remote locations.

What's the **difference** between a **filter** and **purifier**? Both are microbiological water-treatment devices. A filter removes protozoa and bacteria from contaminated water. A purifier does the same, **plus** it eliminates **viruses** in 1 of 2 ways:

- Through the use of an internal disinfectant (such as iodine) which inactivates (or kills) viruses — though it does not physically remove them.
- By capturing them in a filter medium that carries an electrostatic charge, a nonchemical approach taken by the First Need purifier.

Does this always make purifiers superior devices? Not necessarily. For a detailed discussion of the comparative merits of water filters and purifiers, please refer to How to Choose a Water Filter or Purifier below.

Tips for Selecting Safer Water

Avoid filtering water in area where **animal activity** is obvious. Are you near signs of beaver impact? An area where the deer and the antelope have played? A meadow dotted with cow patties? **Find another place** to draw water.

The same principle applies to **human impact.** Is a heavily used campsite nearby? Are you near a trail crossing? A mine? If so, go further upstream for water.

Try to select water from **still, clear water** sources. Many microorganisms, particularly giardia, tend to sink in still water due to the weight of their shells; turbulence keeps them suspended.

If your only water option is **melting snow** or **ice,** choose ice. Ice supplies greater water content, but keep in mind many bacteria are impervious to freezing. Thus while boiling can kill pathogens in water, freezing cannot. Clean snow, though, is still a good source for water. Beware of pinkish "watermelon snow," however. This is a toxic algae that filtering will not remove. If you see it, look elsewhere for ice or clean snow.

How to Choose a Water Filter or Purifier

Is it possible to drink straight from backcountry streams and never become ill? Yes.

Is it possible to drive down a large city's main boulevard, ignore a few red lights and never have a fender-bender? Yes.

Is either practice worth the accompanying risks? In our opinion, no.

The Murky Truth About Clear Water

Free-flowing mountain streams, for all their beauty and clarity, are not always the fountains of purity we imagine them to be. Backcountry water sources — crystal-clear rivers, lakes and streams — sometimes harbor microscopic pathogens (disease-causing agents) that are tough to pronounce, difficult to spell and, for many people, awful to ingest.

Giardia lamblia. Cryptosporidium. Campylobacter jejuni. Hepatitis A. All are members of an invisible fluvial zoo that may be present in pristine-looking backcountry water.

How do they get there? When water becomes tainted by animal or human feces. What impact could such microbes have? They can leave you reeling with diarrhea, abdominal cramps, nausea, weight loss and fatigue. How long might these symptoms last? Between 4 and 6 weeks. Maybe longer. Ugh.

More details on waterborne pests, and techniques you can use to defeat them, are explained in Understanding Water Treatment above. In this presentation our goal is to provide guidance on the water-treatment strategy favored by most wilderness travelers — using a water filter or purifier.

Explaining Water Filters and Purifiers

Portable water filters and purifiers both operate on the same mechanical principle. Using a hand pump and intake hose, both slurp up "raw" water from a lake or stream and force it through an internal element (a filtering "medium"). This medium traps suspended elements — from fine sediment to invisible microorganisms—before dispensing clean water into a container of your choice.

What's the Difference?

Some definitions:

Water filter—A microbiological device that removes bacteria (e.g., Campylobacter jejuni) and protozoan cysts (Giardia lamblia, cryptosporidium) from contaminated water.

Water purifier—A microbiological device that removes bacteria, protozoan cysts **and viruses** (e.g., hepatitis A) from contaminated water.

Viruses are infinitesimal organisms too tiny to be trapped by a filter. Devices identified as "purifiers" usually cause water to interact with iodine (often in the form of iodine resins), which can render viruses inactive. Another purifier uses a positive electrostatic charge in its filter medium to capture viruses.

Viruses:

- may exist in water wherever there is a reasonable chance of human fecal contamination;
- are believed to be less prevalent in North American wilderness water sources than protozoan cysts or bacteria, but may be a greater threat in less developed countries.

Over time, filters have proven that they reliably protect wilderness travelers from the most common waterborne pathogens found in the North American backcountry: giardia and cryptosporidium. Still, purifiers and their antiviral feature offer an elevated level of security.

To fully disinfect suspect water using a water filter, the Centers for Disease Control and Prevention recommends 1) mechanically filtering the water, 2) treating it with a halogen (chlorine or an iodine solution), 3) letting it sit 15 to 60 minutes, 4) then drinking. For more details on this process, and a discussion of what pathogens may be found in backcountry water, refer to Understanding Water Treatment above.

How Purifiers Differ From Filters

To be identified as a water purifier, a device must conform to a US Environmental Protection Agency protocol (last revised in 1987). Purifiers are required to "remove, kill or inactivate all types of disease-causing microorganisms from the water, including bacteria, viruses and protozoan cysts so as to render the processed water safe for drinking." A device must inactivate 99.99 percent of viruses to be labeled as a purifier.

Does this mean purifiers are **superior** to filters? Not necessarily. Depending on conditions (when water is very cold or obviously contaminated, for example), manufacturers of iodine-based purifiers may recommend that users double-filter their water or significantly reduce the rate at which water is pumped through the unit. (The slower flow exposes water to the iodine or iodine resins for a longer period of time.) Sometimes resins must be allowed time to "recharge" after treating a few quarts of water.

Filter-makers, meanwhile, contend that quality filters routinely capture 99 to 99.9 percent of viruses on the first pass since viruses (and bacteria) often become clumped with organic or mineral particles in water. These clumps are easy for filters to trap. Still, when these clumps are "smashed" into a the wall of a filtering element as you pump the water, it's possible a virus could separate from its clump and still slip through.

The purifier-vs.-filter question stirs spirited debate among manufacturers. Some outfitters endorse a movement within the industry to work toward a common filter and purifier standard through the American Society for Testing and Materials.

> **Note:** Pregnant women and people with thyroid conditions often have adverse reactions to iodine. Consult a physician before selecting a purifier.

What Really Matters

In an ideal world, a water filter or purifier will be:

- Simple to use
- Easy to pump
- Capable of sustaining a steady, generous flow
- Effective against waterborne pathogens
- Slow to clog, easy to clean
- Long-lasting

How can you tell if a filter or purifier delivers in these areas? Look for clues in the specification chart that accompanies each product description.

Understanding Specification Charts

Here's how to interpret the information:

Filter medium — This is the cartridge that actually traps pathogens (plus silt and other debris). The composition of the medium contributes greatly to the quality (and cost) of a device. Medium materials include:

> **Ceramic:** This is an effective, high-quality earthen material that can be cleaned many times before it needs a replacement. A ceramic cartridge captures most particles within .005 of an inch of its surface, so it's easy to brush away clogged pores and expose new ones. Cartridges themselves are fragile and require careful handling. Ceramic elements are the longest-lasting mediums and make a good choice for frequent backcountry visitors.
>
> **Ceramic with a carbon core:** This additional layer helps filter out the taste of halogens (chlorine and iodine) plus some organic chemicals, herbicides and pesticides.
>
> **Fiberglass (or glass fiber):** As effective as ceramic in straining out pathogens, but not as long-lasting.
>
> **Structured matrix, or labyrinth:** A dense, honeycombed material that effectively captures pathogens.
>
> **Iodine resin:** A chemical layer integrated with a purifier's filtering medium that deactivates viruses, though it does not actually remove them.

Field cleanable — A desirable feature. This means you may open the filter to brush or scrub the filter medium and increase water flow. Clogging should not cause you alarm; it shows the filter or purifier is working. Ceramic filter media can usually accept dozens of cleanings. Some models can be cleaned through backwashing (feeding clean water through the filter in reverse) but you need ample clean water in order to do so.

> **Longevity:** How long will a filter or purifier last? Ceramic filters that can accept cleaning will last the longest, but the life of any filter depends on the **clarity of water** you pump through it. If possible, seek out clear water in still pools. You're likely to find less sediment in such water than in rushing water. Use a prefilter if your device includes one. Manufacturers sometimes include an estimate of the number of liters a filter or purifier is expected to treat effectively.

Pump force — The higher the number, the harder it is to pump. The Katadyn Pocket Filter, for example, has a pump force number of 16.5. While this is one of the longest-lasting filters available, it really gives users a workout as they pump.

A few additional considerations not listed in spec charts include:

Effectiveness — All of the filters and purifiers in most outfitters' product mix will knock out larger microorganisms such as giardia and cryptosporidia. So what do you get for choosing a more expensive filter? Usually a longer-lasting filter medium, cleanability features and maybe a more efficient pump handle. Which filter is right for you? Here's a basic guide:

- If you're a recreational backpacker, someone who takes 1 or 2 overnight trips per year, an inexpensive filter will serve you well. Still, be careful about what type of water you send through it. Make it as clear as possible and the filter will last longer.
- If you visit the wilderness regularly, seek out a field-cleanable model designed to provide years of service
- People who explore terrain closer to urban areas, at lower elevations and who travel outside the United States and Canada are candidates for a purifier.

Pore size — A familiar benchmark for determining a filter's effectiveness is to establish that it is a "point-2 (0.2-micron) filter." The number refers to the size of the pores (openings) in a filter medium. It's not a bad gauge, since the smallest bacteria measure 0.2 microns, yet some microbiologists will tell you it is a simplistic standard. Factors such as maximum flow rate, minimum wall thickness and adsorptive capacity can influence such a conclusion. Arguments can be made to show that a 0.3- or 0.4-micron filter can be as effective at trapping the particles as a 0.2-micron filter.

> **Tip:** Look for "absolute" pore size (the largest and least effective holes) when evaluating filters, not "nominal" pore size.

Adsorption — When filter media block particles while clean water streams through, the process is known as "sieving." When particles stick to the media in the manner of a magnet, this is "adsorption." Activated carbon, found in some filters and purifiers, is especially effective at adsorption.

Product Summaries

Here are brief performance overviews of the filters and purifiers carried my many outfitters. Product mix occasionally varies from the lineup shown here.

MSR WaterWorks II
A popular filter that may offer the finest microfiltration of any device found on this list. Its ceramic filter medium (which screens out protozoan cysts and bacteria) includes a carbon core (which removes elements such as pesticides and chlorine) and is embellished by an ultra-fine membrane captures the tiniest bacteria (0.2 microns). It's field-maintainable, long-lasting and the pump is easy to use. Its clear housing makes for interesting viewing while the filter is in action, too.

MSR MiniWorks
A lighter, more compact version of the WaterWorks II. It includes the carbon core but lacks the added membrane. A lot of filter (cleanable, too) for a good price.

Pur Explorer
A popular purifier-class device that uses iodine resins to deal with viruses. Independent testing showed that it's capable of producing a flow of 1.39 liters per minute — and that's terrific output. Twist the handle a quarter-turn and it becomes a brush that can abrade the glassfiber medium and prolong its life. Its exit filter, the "Stop Top," is a carbon-filled cap that can be fitted into water bottles and eliminate any iodine aftertaste.

PUR Scout
This purifier is a lighter version of the Explorer, without the built-in brushing function. Its filter medium can still be cleaned in the field.

PUR Voyageur
A reliable, lightweight (12.5 ounces), affordable purifier that performs well with proper care. Once clogged, its filter media must be replaced.

PUR Hiker
One of the all-time easiest filters to use and, for its reliability, a great value.

PUR Pioneer
A dependable filter for beginners and short-haul casual users. Easy to use, but its glassfiber disks can clog quickly in water with above-average sediment.

Katadyn Pocket Filter
This Swiss-made ceramic filter is a standard-bearer for durability and reliability. Its silver-impregnated core helps retard any bacterial growth when not in use. The manufacturer estimates that it can produce up to 13,000 gallons of clean water and its ceramic cartridge can be cleaned up to 300 times. Drawbacks: It's heavy and it can be a chore to operate. But what a workhorse.

Katadyn Mini Filter
A lighter, less elaborate version of the Pocket Filter, though its ceramic filter offers the same silver impregnation found on its big brother. Expected lifetime: 2,000 gallons.

First Need Purifier
This unit's proprietary "structured matrix" design is "electrically charged" and uses sieving and adsorption to produce its purified output. You can use this unit's stuff sack to convert it into a drip filter when you're in camp. Over time, clogging can be a problem with this noncleanable device.

SweetWater Guardian
Light, fast and safe, many people enjoy this filter's long-handled pumping mechanism.

Sweetwater Walkabout
Popular among users who prefer a small, lightweight, inexpensive filter. Reliable, though not as long-lasting as some models, and a little tougher to pump.

Exstream Squeeze Bottles
This product line is the first to satisfy the EPA protocol. As a purifier, it produces a somewhat thin flow, but so what? At last, a dependable device that allows you to safely dip and sip at midday without taking the time to break out your filter.

Other Considerations

Replacement cartridges should be available for all of the filters and purifiers at the outfitter where you purchased the filter. They cost roughly one-half of the original unit's cost.

Some models **attach directly** to specific **water bottles,** which is a nice touch. It can prevent a heartbreaking spill in the field.

If you're visiting places where **turbid water** is a factor (say, the desert southwest), a cleanable ceramic filter should be tops on your list. The same goes if you'll be filtering for a **group.**

Avoid filtering water in area where **animal or human activity** is obvious.

Try and filter water from **still, clear water** sources. Many microorganisms tend to sink to the bottom of still water; a turbulent stream keeps them suspended.

Rather than filter directly from the stream or lake, **put water in a pot** and filter from that. This gives you a chance to examine exactly how the water looks before you send it through your filter. This helps prevent clogging. If the water is cloudy, let it sit in the pot for an hour or so, then skim the clearest water off the top.

Don't save the first few streams of output from your filter. They don't taste as fresh.

When you clean your filter, recognize you are handling a **potentially contaminated object.** Don't handle food or put your hands to your mouth after cleaning your filter.

Follow manufacturer instructions for cleaning and **storage.** At home, consider pumping a weak bleach-and-water solution through the filter to sterilize it. If you can disassemble your unit, allow it to **dry out completely** before storing it.

How to Choose Water Bottles

The same qualities you want in a trail partner — reliability, trustworthiness, durability — are the same features you want in your water containers. On a lengthy outdoor excursion, a water bottle becomes your portable fountain of life and one of your most valued companions. You want to know that you can count on it.

Trail-worthy water bottles can either be rigid or collapsible. Rigid bottles are tougher to break or puncture, but they take up space in your pack even when they're empty. Collapsible water bags fold up tight when empty to save space in your pack, but at times they can be a little awkward to handle.

Materials

Almost all rigid water containers (and many collapsible ones) are made of plastic. It is inexpensive, durable and lightweight. Customarily your choices are:

- **Polyethylene** (usually a cloudy white color) — Inexpensive, flexible and won't crack easily. Used in hard-sided water jugs, collapsible water storage bags and some hydration reservoirs.
- **Polycarbonate** (Lexan®, a clear plastic) — Won't retain odors or flavors from acidic drinks or leave a plastic taste like polyethylene bottles can. Slightly more expensive than polyethylene bottles, but also more durable.
- **Coated fabric** — Some collapsible water containers are made of coated nylon fabrics. Others use it as outer shell material to protect flexible plastic bags inside.

Considerations

How many do you need? — Two quart-sized containers are the norm for just about any self-propelled activity where a hydration system is not involved. If you're hiking in warm weather, it's likely you'll drink a gallon or more per day. But water is heavy — approximately 8.3 pounds per gallon, so it's smarter to carry modestly sized containers and replenish your supply as you go. Just make sure your route passes lakes or streams and always treat water before you drink.

> **Note:** If you are exploring an arid environment, often you need to place a water cache along your route. You may be able to do this in advance of your trip, or you must lug in extra containers and conceal them within the rocks and weeds for retrieval on your way out. This is a customary practice, for example, for hikes into the Grand Canyon's interior from the park's more remote trailheads. Accordingly, you will need enough containers to address your needs. Be prepared!

Bottle mouth size — Large-mouth bottles tend to be more convenient for filling and drinking. Smaller openings offer more control when pouring (important to some backcountry gourmets).

Compatibility — If possible, choose water bottles that can connect directly to your water filter/purifier. This helps you avoid heartbreaking spills while you're pumping. (Nalgene wide-mouth bottles and MSR's MiniWorks filters, for example, make a good match.)

Shape — Round bottles will slip into your pack pockets more easily. Square bottles are easier to stack in main pack compartments. Bike-sized squeeze bottles are fine for day hikes, but their small capacity makes them less than ideal for a long-haul trip.

Camp containers — To avoid multiple trips to a water source while camping, bring along a collapsible container. These bags range in size from a quart container to a 5-gallon bag.

Cleaning your Water Bottles

Over time, hard plastic water bottles occasionally develop unpleasant odors and/or tastes. This typically occurs when bottles are stored incorrectly or cleaned infrequently.

Most rigid water bottles are made out of either polyethylene plastic (which tends to be cloudy in appearance) or polycarbonate (which tends to be clear). Most hydration system bladders have polyethylene linings, which retain tastes and odors more easily than polycarbonate. But all plastic bottles can develop nasty tastes or odors if cared for incorrectly.

General Care
The best way to maintain any plastic water bottle or bladder bag is to rinse it out after each use and to let it air dry completely. Most odor and taste problems occur when bottles are stored in wet areas or kept sealed for long periods of time with liquid inside. Polyethylene bottles can also develop unpleasant tastes/odors when they're used to store a variety of acidic juices.

Cleaning
If your water bottle develops a funky taste or odor, try the following procedure:

- Put a teaspoon of bleach and a teaspoon of baking soda in the bottle and fill it with water.
- Let the bottle sit overnight.
- Rinse out the bottle completely the next day (or run it through the dishwasher).
- Let the bottle air dry completely.

When cleaning hydration bladders, rinse them thoroughly and let them completely air dry before using them again. Do not place in your dishwasher.

NOTE: *Some tastes and odors can be removed from plastic water bottles simply by rinsing them with anti-bacterial mouthwash.*

Gear Care and Repair—Hydration Systems

Unless you're researching mold growth or odors caused by unchecked microbe production, you'll want to clean your hydration system regularly. Here are a few simple tips.

Water Bottles

To keep water fresh for drinking, water bottles need only a simple rinse and dry. The key is making sure they are dry before storage.

To eliminate odors, fill the bottle with water and a tablespoon of baking soda. Let it sit overnight and then rinse it out with warm water. For a more thorough cleaning, use 2 teaspoons of bleach in a filled reservoir and let it set overnight. Rinse with warm water in the morning.

Hydration Packs

Much like water bottles, a simple rinse and dry will keep your reservoir clean. However, special cleaning systems are available to help sanitize the hard-to-reach spaces of a hydration pack reservoir. These kits include cleaning brushes, cleansing agents and specially designed hangers that open up the bladder so it can dry properly and thus reduce any microbial presence.

To eliminate odors, follow the same instructions listed above under water bottles.

Selecting Backpacking Gear for Women

Backpacking equipment can differ between men and women. Some of her recommendations for women backpackers might be helpful to you:

Backpacks

- Make sure a backpack's hipbelt is positioned on your **hips,** not your **waist.** A hipbelt should straddle the 2 prominent bones on the front of your hips, known as the iliac crest. This is where a pack's weight is most effectively carried. The weight of a pack won't feel comfortable on your waist, but some women try to wear it there. You've got to get the belt down on the hipbone."
- **Hips are an individual matter.** Some women are more conically shaped than others. If your hips have more of an angle, some packs have hipbelts that may fit a little better, like packs from The North Face and Arc'Teryx. If your hips aren't very conical, most female or unisex packs should fit your hips fine.
- An **internal-frame pack** is a good choice for females. When women walk naturally, they tend to sway a bit more in the hips. An internal is designed to give a hiker better balance, and a woman can walk a little more naturally while wearing one without feeling like she's going to tip from side to side.
- Look for packs that offer **S-shaped shoulder straps.** Straight shoulder straps you see on men's packs might pinch a woman. An S-curved shoulder strap really helps a lot, especially if you're kind of chesty. Kelty offers a curved shoulder strap on some of its external-frame models for women.
- The **space between the shoulder straps** is sometimes narrower on women's packs. If they're too far apart, they might slide off.
- When you **load your pack,** place **heavier items lower** in the pack against your back. Women tend to have weaker upper bodies then men. By concentrating the majority of the weight on your hips, it's easier to carry.

Fanny/Lumbar Packs

- Many women prefer fanny packs or lumbar packs because, as just mentioned, they focus the weight on the body's most efficient load-carrying area—the hips. A woman's strength ratio is greater in her hips, so it makes sense to carry weight close to your hips. Women seem to like the results fanny packs give them."\

fanny pack

Sleeping Bags

- Some sleeping bag designs, including some models by Sierra Designs and The North Face, are specifically configured to a **woman's anatomy.** Some bags are a little narrower around the shoulders than a men's bag, which helps less air enter or escape at the top. They're also wider at the hips and thighs, where women are a little rounder. That also allows extra space for curling up, which is how a lot of women sleep.
- Bags intended for women sometimes provide **extra insulation** for the upper body and in the footbox. Those are usually a woman's cold spots.
- Be careful -- just because it says it's a women's bag doesn't necessarily mean it's going to fit you better. It's best to climb in the bag and try it.
- **Down** tends to be more popular with female customers than **synthetic insulation.** It's the feel they're used to at home and they like the lower weight and ability to compact it into something small. If you choose down, be carefully you can't get it wet.
- What about **temperature ratings?** Evaluate your style of travel choice of destinations. Anticipate the worst conditions you might encounter. Select a bag with a temperature rating that can handle the lowest temperature you may face. If your choice is a toss-up, choose a warmer bag.
- Due largely to the different blood volumes carried by men and women, women often need a bag with a **lower temperature rating** than a male taking the same trip. It is quite logical, Stephanie says, for a male to carry a +15°F bag and a woman to carry a bag rated to 0°F.
- Most mummy bags, even those from different manufacturers, have **compatible zippers,** allowing you to zip bags together for a shared sleeping space. To do so, the bags must zip open on opposite sides. You can only attach a "right-zip" bag with a "left-zip" model. Such an arrangement makes for a cozy setting, but a less heat-efficient area. You have more space to heat inside so it's not as warm.
- **Sleeping pads,** which insulate you from the ground, contribute much to your sensation of warmth or coolness as well as your comfort. Stephanie likes a 1.5"-thick self-inflating air mattress, full length. Women have a little more curve in their backs so this helps fill in the gaps.

Boots

- Women's feet tend to be narrower than men's feet. This is often most noticeable in the heel. Some type of boot insert is also a worthwhile consideration, since women's feet often are not as well padded as men's feet.

Before You Leave Home

Before you leave on a backpacking trip, it pays to double-check your preparations. Consider these reminders:

- Make sure you have all of the equipment, clothing and food you'll need for your trip. Use a checklist to make sure you haven't forgotten anything.
- Make sure you have all the paperwork you'll need—maps, campsite reservations, parking permits and wilderness permits.
- Carry enough cash for emergencies, phone calls or unexpected fees.

Leave an Itinerary
Before you head out the door, give someone you trust a written copy of your trip plans. This written plan should include:

- Your estimated time of departure
- The names, addresses and phone numbers of all group members
- Any relevant medical conditions that may affect group members
- Your vehicle's make, model and license plate number
- Your expected route of travel (including trailhead information)
- Your expected camping sites along the way
- Your final destination and expected time of return

Make plans to contact the person holding your trip plan when your trip is over (or at specific intervals during longer trips). Agree on a procedure for contacting the authorities if you do not report in by a certain time.

Leave a photocopy of your itinerary in your vehicle and under your seat. If a search and rescue team undertakes a mission on your behalf, every second counts. It's possible team members will attempt to enter your vehicle in hopes of finding any scrap of information that may help them find you. If you change your plans, call your contact before you start and give them the update.

Road Check
Know the conditions of the route to your chosen trailhead. Inquire locally to verify that your vehicle can handle the roads (or ruts) that lead to it. If the route is isolated, unpaved or only seasonally maintained, contact a ranger, park manager or a local before you leave to make sure the route is passable all the way to the trailhead.

What If?
Plan for the unexpected "what ifs?" Those would include: What if I get delayed? Lost? Injured? Am I prepared to cope with that? Make sure that you are.

If you don't already own a compass, at least pick up an inexpensive beginner's model (reliable models start around $10) before you leave town. You need to understand basic map-and-compass navigational skills. How do you learn? Two starting points:

- Take a navigation class. Study the Boy Scout Handbook and Fieldbook, or review the Orienteering Merit Badge book. Community colleges or high schools with adult extension programs often offer such classes on weekends or at night.
- Find a friend who really understands topographic maps and compass usage; ask that person to join you on a day hike and learn all you can.

Take out your map at home, when you're under no pressure, and study your intended route in advance. This gives you time to become more familiar and comfortable with the distinctive markings of a topographic map.

Minimum-Impact Travel

Wilderness lands are special places. Accordingly, they require special treatment from human visitors in order to preserve the qualities that make them so attractive.

Human intrusions and carelessness can alter a natural landscape for generations. One of the most valuable skills you can learn is the ability to "tread lightly" as you explore our planet's mountains, coastlines, grasslands and deserts.

Several articles in this syllabus amplify the leave-no-trace principles of wilderness travel endorsed by the Boy Scouts of America as well as other outdoor groups. We summarize those points, and mention a few others, in this list:

- **Pack out what you pack in.** It's not a cliché; it's the first commandment of responsible backcountry travel. Please don't leave litter behind, not even an orange peel. Please.

- **Behave like you're a guest** in a good friend's home. You wouldn't leave used tissue paper on the floor of a friend's house; likewise, pick up after yourself in the backcountry. Don't snap off branches of living things; don't make a racket; don't trample the flowers. Make it your goal to disturb your surroundings as little as possible.

- **Stay on established trails.** When traveling cross-country (off trail), choose to walk on rock or snow rather than soil. Spread out so you don't wear a groove in trail-less terrain. **Never cut switchbacks** on trails.

- **Avoid hiking on muddy trails.** If you encounter mud, walk through it, not around it. Your boots are built to handle it.

- If you visit the desert, **learn to identify cryptobiotic soil**. It looks like dark crust, but it's very valuable to a desert ecosystem. Avoid stepping on it. In seconds one footprint can destroy a natural soil-stabilizing process that involves years of imperceptible growth.

- **Camp in established campsites** whenever possible. Choose a location that conceals your presence from the sight of others.

- Dispose of **human waste** far (at least 200 yards) from water sources and trails.

- **Use a camp stove** rather than building fires.

- **Keep your food away from wildlife,** and never feed animals intentionally; it alters their natural foraging habits.

- **Take responsibility for your actions.** Think of the overall good of the area, and those who will follow you. Your decisions will impact how others are able to enjoy the area you are visiting.

Take time to do it right. Minimum-impact backpacking techniques can take a little extra time and effort. Just keep reminding yourself that the payoff—a more enjoyable wilderness experience for everyone—is worth it. Make it your goal to Leave No Trace.

Campsite Selection

The sun is dipping toward the horizon and you're seeking a place to spend the night in the backcountry. Here's what to keep in mind:

Spring Through Fall

- **Know in advance** where campsites can be found on the trail. Consult a guidebook, then discuss your options with a ranger when you pick up your backcountry permit. (In some heavily visited areas, you may have to pre-select a specific site in order to obtain the permit.) Be nice to the ranger; he or she might recommend a choice spot to you.

- Backcountry campsites are often found at trail junctions, lakes or rivers. **Some popular areas are closed to camping** due to heavy use. Know the local rules and please abide by them. If a prime-looking campsite has been closed or sits in off-limits territory, do the right thing—move on and let the land rest.

- **Advance reservations** can sometimes be made for popular hiking destinations. If you plan to visit during peak season, inquire about this possibility with the ranger office that oversees its management. If that's not possible, you should **obtain your permit as early as possible** on the day of your departure (or the day before—rules vary at different wilderness areas). More site choices will be available early in the day.

- Schedule your day so you arrive at your chosen campsite at least **2 hours before sunset**. You don't want to race to finish last-minute chores in twilight.

- Seek out **previously impacted** areas. These are usually flat, shaded spots close to a water source.

- **Consider the feelings of others** when selecting your site. Are other people camped within easy earshot of a site you are considering? Then try looking around for another option. Don't crowd other campers unless positively no other choice exists. Also: Don't plunk down your tent in a spot that spoils a view that other people came to see. When you enter the wilderness, blend in, don't barge in.

- What's the most important consideration when selecting a campsite? The view? It's important, true, but your site's **proximity to water** is usually Factor No. 1. You will need water for cooking, cleanup and filtering for your next day's drinking supply. Plus, camping near water gives anglers a chance to test the waters for fishing prospects. The final bonus: The sound of a rushing stream or of a lake's small waves lapping a shoreline provides a soothing audio backdrop as you drift off to sleep.

- You want to be close to water, but not right at water's edge. Choose a spot **200 feet away from the trail and water**. You want to 1) stay out of sight (if possible) of other hikers and 2) give wildlife an unobstructed path to water.

- One of the negatives of camping near a lake or slow-moving water: **bugs**. If mosquitoes are a problem where you want to camp, try to select a site where a breeze is stirring. That won't solve the skeeter problem, but some wind might help ease it.

- If you will use your campsite as a basecamp for day trips, choose a site that offers **ample shade** during the day. You want to minimize the amount of time your tent is exposed to the sun. A tent's nylon canopy deteriorates when left in direct sunlight for prolonged periods.

- Many people like to point the head-end of their tents toward the east to catch the **sun's early morning rays**. It's not essential, but if you want to get an early start, this tactic may help nudge you out of the sack in the morning.

- Anticipate the wind. If it's gusting, try to select a campsite where boulders or trees provide a **windbreak**.

- Be mindful of **low spots**. If you are camping along a **river** or within **narrow canyons**, seek higher ground when making camp in case bad weather moves in overnight. Low spots tend to collect water. Cold air sinks, of course, making low spots chillier. So, if your destination gives you the option, take the high road.

- If you're camping on the **beach**, choose a spot beyond the most obvious tide line.

- Don't pitch your tent in a plant-filled meadow, on a lakeshore or in some other pristine, picturesque, **never-before-trampled spot**. While scuffling around, you may cause **damage** to the scenery that will take years to reverse. If you are off-trail and must camp in some rarely traveled area, camp on smooth rock or bare ground (sandy, light-colored mineral soil, for example) so your impact will be barely noticeable to future visitors.

Winter

- Where should you set up? Either **on snow or on bare ground** that supports little or no plant growth. Camping on snow reduces your environmental impact to nearly zero—very appealing. Just be mindful of animal tracks; try to avoid disrupting a path that might serve as a lifeline for the resident wildlife. If the only bare ground you can find harbors plant life that would suffer from your trampling, camp on snow.

- **Camp higher** rather than lower. Cold air really sinks in winter. Avoid valleys if possible.

- Calculate where the **sun** might arrive first in the morning. Position your tent so you won't be sitting in the shadow of some peak while a spot a hundred yards away will receive full-throttle sunshine an hour earlier.

- Consider the **wind**. Examine the surface of the snow where you might camp. Has it been shaped by wind? Does it have a frosty, brittle texture while other spots in the area are soft? These signs indicate harsh wind patterns. It's best to look elsewhere for a site.

- Scan the area around your potential campsite, particularly above it, for signs of past **avalanche activity**. Can you spot a section of trees that was mowed down by a past avalanche? Any piles of avalanche debris in the area below you? See any snow-collection basins or steeply pitched couloirs looming high above you? If so, make tracks to a less-threatening area.

Year-Round

- Keep your site **clean**. This should be obvious, but some people ...

Bottom line: Be responsible, and treat the backcountry gently. You appreciate arriving at a clean campsite in a wild, beautiful setting, right? Please do your part to make sure those coming after you will enjoy the same experience.

Setting Up Camp

You've spent the day covering 10 miles on trail. At last you've reached your destination for the night, and you are elated, sweaty, tired and hungry. The angled sunlight reminds you that it will be dark in a couple of hours. What do you do next?

Housekeeping Basics

First, locate and claim a campsite. Make sure it's a legal and appropriate one. How do you make a good choice? Follow the guidelines outlined in our Campsite Selection section below. It offers details on things you should do, including:

- Possess any necessary permits.
- Make sure your campsite is at least 200 feet away from water and trails.
- Choose a site previously used by other campers; avoid impacting untrammeled ground.
- Show courtesy to other campers; try to stay invisible to one another.

Unpacking

Once you choose your spot, drop your pack and begin unloading gear. Some strategy tips:

- Put your flashlight/headlamp in a place where you can easily remember its location.
- Sort food/kitchen items separately.
- Find your jacket or pullover and put it someplace handy.
- Locate your tent and ground cloth.

Shelter

Start with tent setup. You want to have quick access to a sheltered safety zone in case the weather changes or bugs attack.

Choose a flat spot for your tent, preferably a shaded one. Spread your ground cloth over that spot. Then lay on it and give your spot a test-rest. (This is a step lots of people neglect to make.) Does it feel level? Lumpy? Clear away any debris that pokes you in the back. But don't rip up the spot attempting to make the spot too perfect. When major bumps are gone, set up your tent.

Note: If you have to clear so much debris that you'll alter the look of the area, find another campsite.

Follow the seams: This is a good phrase to remember if you get a little confused while assembling a tent. It's easy to start criss-crossing poles and begin inserting them into the wrong pole sleeves. Pole sleeves are usually stitched into the main seams of a tent's breathable canopy. Thread each pole through the series of sleeve sections that line up along a single seam. Setup becomes simplified when you *follow the seams.* **Some additional tips:**

- If you can't find a level spot, angle your tent so your head is higher.
- If it's windy, try to set up in a wind-buffered area, such as behind rocks. Point the low end of your tent into the wind to help prevent a blow-down. Plant your initial tent stakes with the wind at your back.
- If it's a warm night with just a breeze blowing, aim your door into what wind there is; it might help shoo away mosquitoes.

- Do NOT dig a drainage ditch around your tent. This is an old-school practice that ruins campsites and hastens erosion.
- Unroll your sleeping pad, unstuff your sleeping bag and place both inside your tent, then zip it shut. This gives your bag some time to regain its loft.
- If the terrain permits, aim your tent's door toward the east to catch early morning light. That helps encourage everyone to get an early start.

Kitchen

Keep your food together. Typically hikers carry main food items in 1 or 2 stuff sacks to keep them consolidated. Then they hang the bags in a tree or other high spot for safe overnight storage.

If you are camping in California's Sierra Nevada range, where black bears have become skilled at snitching food, you may need to carry a bear canister. Before starting a trip, ask local rangers about conditions in the area you plan to visit.

Wherever you camp, you'll need to keep your food within sight (or safely stored) once it's no longer on your back. Any number of critters, including squirrels, chipmunks, marmots, even gray jays, might take an interest in your food if they catch you looking the other way. Even if you're wandering just a short distance from camp—say, to the stream to filter water—it's smart to take your food with you.

Do your part to keep wildlife wild—keep a clean kitchen in the backcountry; practice the proper food storage techniques. NEVER give food to a wild animal, even a cute little chipmunk. You do a wild creature a grave disservice by doing so, changing them from foragers to scavengers.

Special care is required when camping in grizzly bear habitat. Set up your kitchen at least 200 feet from your campsite. Avoid cooking aromatic foods. Cook in one set of clothing, sleep in another. The goal is to keep all food odors as far from you, and your tent, as possible. **Other camp setup tips:**

- Set up your stove on a level spot. A flat, bare rock, sheltered from wind, is ideal. Make sure nothing flammable is nearby.
- If you plan to counterbalance your food bags for the night, seek out a suitable limb—and get a cord up and over it—while you still have light.
- Nutritionists recommend eating within 1 hour of vigorous exercise to accelerate the body's recovery process. Consider munching on an energy bar if camp duties preclude you from eating a meal that quickly.
- Filter water in the evening so you can save time in the morning and break camp as early as possible.
- If you're in a group, make sure the workload gets delegated fairly. Rotate whatever tasks are most burdensome for your party.

Before You Turn In ...

- Know the location of your headlamp/flashlight. Always keep it in the same place inside your tent. The same goes for toilet paper and your sanitation trowel.
- Critter-proof your camp for the night: Hang your food; leave nothing aromatic (including food, toothpaste, lotions, et al.) inside your tent; don't leave sweaty items hanging overnight in places where salt-loving rodents may shred them.
- Empty your backpack, zip open every pocket and compartment and, if possible, hang it off the ground from a tree snag. If the pockets are open, varmints won't be tempted to chew through the fabric to see what's inside.

- Consider bringing along an extra T-shirt or other top for sleeping only. You'll feel cleaner inside your sleeping bag.
- Use a wad of clothing for a pillow. Some people carry a pillowcase to help smooth over any wrinkles in the wad. Another pillow option is an inflatable bag.
- Consider earplugs if you want to block out overnight sounds (streams, wind, snoring companions).
- Show respect for other campers in your vicinity; keep your camp's volume level low, especially after dark.
- At some point, pause to take in the silence and beauty of your surroundings; appreciate the sublime qualities of spending a night in the backcountry.

Food Handling and Storage Strategies

A well-supplied backpack can transform a recreational walker into

- a wilderness adventurer
- a model of self-sufficiency
- a movable grocery store

It's true. A bulging backpack may say "outdoor explorer" to you, but to the resident animal population of a wilderness area it may shout "lunch wagon!" The savvy hiker understands this backcountry truth and comes equipped with strategies for keeping his or her food secure at all hours of the day.

Altering Animal Behavior

Human food has become powerfully attractive to wild animals that inhabit North American wilderness areas—squirrels, chipmunks, pikas, mice, raccoons, goats, marmots, bears, even gray jays and deer.


Yosemite National Park Archives

These animals are instinctive foragers and are not naturally inclined toward the foods people consume. Yet when people become careless or haphazard with their food—or worse, when they **intentionally** offer critters their cheese puffs or other manufactured edibles—wild animals get a taste of something new and intense, and their customary food-seeking habits are negatively transformed.

"Bears like any food, and human foods are appealing because they taste good and bears consider them easy to get," says Jeff Watson, a bear-handler who works with the television and film industry. "Bears always take the shortest route possible to get their calories, and over the years they've learned humans tend to be an easy source of food. Bears are easy to train, but you can never untrain them."

When an animal gets a taste of human food, it's going to want more—lots more—and will go to extremes to get it. Bears and raccoons show remarkable determination and ingenuity in their pursuit of a free lunch.

A Few Facts to Ponder

- In 1998, bears in Yosemite National Park broke into more than 1,300 parked vehicles, causing more than $630,000 in damage. Intelligent, powerful and persistent, bears also possess a sense of smell 100 times stronger than a dog's. They visually recognize food coolers and associate them with food, and will smash a vehicle's window to get at one. Or, if they sense something interesting is locked in the trunk of a car, they will break a rear window and then claw through the back seat to get at the item.

- The number of vehicle break-ins dropped to 318 in 1999 due to an intensive education program by park rangers in campgrounds. **A new Yosemite policy forbids visitors** (except those in motor homes) **to store food in their vehicles when parked.** Instead, food must be placed in one of more than 2,000 metal "bear boxes" scattered among campgrounds and parking areas.

Tip: If you start an overnight backpacking trip in Yosemite Valley, you will be assigned to

park your vehicle in a dirt lot near the valley's east end. Years ago that area served as the Curry Village dump! That means generations of bears have been conditioned to prowl that area for food. Be sure to leave nothing aromatic inside your car when parking here; definitely use the bear boxes provided.

- In 1999, 3 "problem" bears were put to death; 33 others had to be relocated, though a wildlife biologist acknowledges that within a week nearly all relocated bears return to the area where they were captured.

"A fed bear," says bear-handler Jeff Watson, "is a dead bear. The real problem is people who make it too easy for bears to get at their food."

Jim Miller, program manager for dispersed recreation for the US Forest Service, agrees. "Wild animals are natural foragers," he says. "Any time you introduce a new food into their habitat, animals are going to take an interest in it, and that's expected. But having access to human food disrupts an animal's natural foraging instincts. It's important for people to store their food correctly so animals can't get at it."

Save the Animals

Some newcomers to national parks or wilderness travel are annoyed, even offended, by the notion that 4-legged food thieves may be lurking in the woods. Don't be. You are the visitor in their habitat, and it is your responsibility to make your food supply—a foreign substance in the wilderness—as undetectable and unobtainable as possible.

And it is a responsibility. If you are careless or sloppy with food, your actions may put other people at risk of food thievery (since animals regularly revisit areas where food is easily obtained), or they can lead directly to the death of a wild animal—particularly a bear.

"When people don't store their food effectively, a bear steals it and the people suffer a loss," says Harold Werner, a wildlife biologist at Sequoia and Kings Canyon national parks in California's Sierra Nevada. "The real loss, though, comes later.

"Bears become habituated to human food, then turn fairly bold in their efforts to get more. As they get more aggressive they become more dangerous, and at that point we have a legal obligation to kill them. No one likes doing that.

"We want people to store food correctly and keep it safe, but more importantly we want to preserve a resource—in this case, the bears. Any storage requirements we put in place are not designed to protect people, but protect bears."

Here are some options for storing food when you are in a park's front country or deep in its backcountry.

Tactics to Protect Food, Safeguard Animals

Land management agencies, including the National Park Service, endorse no single food-defense strategy. Each unit of the Park Service establishes an individual policy appropriate for its resident wildlife. As described later, the rules become especially important when you're camping in grizzly territory.

Some guidelines, however, do apply to **all** food storage situations:

- Never leave your food, even if it's still in your pack, unattended at any time of day.
- Anything aromatic—powder, ointment, toothpaste, sunscreen, bug spray, lotions, utensils—must be stored overnight along with your food. Animals aren't picky; they're drawn by any exotic smells.
- Leave nothing inside your pack overnight, and leave all pockets and compartments unzipped. This allows any nocturnal visitors to snoop around without tempting them to gnaw at or shred your gear out of curiosity.
- Store your food at least 100 feet (preferably 200 feet or more) away from your sleeping area. The food stash should be downwind of your site, if possible.

So, where should food go when you're asleep or away on a day trip?

Bear Boxes
The availability of bear boxes—large metal containers with hinged, latched openings—varies. Yosemite has more than 2,000 bear boxes within its boundaries, but only 10 are found in the backcountry, scattered among its popular High Sierra Camps. The rest are found only in campgrounds and parking areas. In Sequoia and Kings Canyon national parks, meanwhile, bear boxes are located at a few dozen popular backcountry campsites.

Our advice is simple: If they're available, use them. Some tips:

- At campgrounds, make sure your items are identified. Food coolers and grocery bags can be easily confused.
- Don't use boxes as trash receptacles, even if others have done so in the past.
- Make sure you properly close and secure all latches after each visit.

Bear Poles
Bear poles are tall metal poles with hooklike arms at their pinnacles. Usually a lifting pole is hooked to the side of the main pole. Hikers hoist bear bags (or their entire packs) up to the hooks for safekeeping overnight. Mount Rainier and Glacier national parks provide bear poles at their backcountry campsites. Bear poles, as long as they're built high enough (and that's not always a given), are convenient and easy to use. The biggest challenge: It can be tough to be the last camper to hang your stash on a crowded night.

Bear-Resistant Containers
Hard-sided, secure-locking food containers, often referred to as bear canisters, are portable food lockers that have been used in the backcountry since the mid-1980s. In some national parks, such as the high country of Yosemite, use of such containers is mandatory.

Bear Hangs
Counterbalancing—This can be a frustrating job. Do it enough times and the thought of toting a bear canister becomes less objectionable. The procedure:

- Divide your food and aromatic items into 2 bags. Nylon stuff sacks will do. Try to keep them equally weighted.
- Locate the perfect branch. Backpackers may hike a lifetime without finding one, but here's what to look for: a live branch, one that cannot support a cub's weight, at least 20 feet high and extending

at least 10 feet away from the trunk.

- Take a length of cord, at least 50 feet of parachute cord (about 1/8" in diameter), and tie a rock on one end. Toss the rock over a spot near the far end of the tree branch. (Note: Do this when you have plenty of light.)
- Retrieve the rock and tie the cord to one bag. Put a loop in the cord that you can use for snagging the bag in the morning. Pull the bag all the way up to the branch.
- Reach high on the remaining cord and tie the second bag as high as you can. Create another loop. Stuff the remaining cord in the top of the bag.
- Toss the second bag up (or push it up with a stick), ideally getting the two bags to dangle side by side about 12 feet off the ground. Before you do this, make sure you have access to a stick long enough to snag the loops you created.
- A retrieval option: Fasten a strand of barely visible fishing line to one of the bags so you can reel in your bags without having to swat at them with a stick.

Bear-Bagging—

- Place your food and aromatic items in 1 or 2 bags.
- Find 2 trees about 20-25 feet apart.
- Take a 100-foot length of parachute cord, tie a rock on one end and toss it over a branch about 18-20 feet above the ground.
- Tie one end to one tree trunk. Then tie your food bag or bags to the midpoint of the length of cord.
- Toss the weighted end of the cord over a branch in the second tree.
- Pull the cord across that branch until the food bag is suspended in midair between the two trees. Tie off the cord on the second tree trunk. Two 50-foot sections of cord, with food bags tied at their junction, can also work.

In some areas, though not many, it's still possible to toss a cord over a relatively high tree branch, hoist up your bags and simply tie off the cord to a tree trunk. This is a big risk in most areas, though. A bear will recognize this old ploy and quickly gnaw through the cord to make your bags drop.

Some people dangle food bags over **the side of a ledge.** But: Will the cord hold? Will small rodents discover it and gnaw their way in? Might a bear claw at the cord and make it snap? A ledge-hang might work, but it's less than ideal.

If you are in the **desert** and no trees are available, it's still a smart idea to keep your food items off the ground. If you're carrying a camera tripod, you could suspend a food bag from it and keep it safe from mice.

If a black bear enters your camp, make noise. Bang pots, wave your arms, shout, even throw a few small rocks at the bear's backside (not its head) from a distance. But don't approach it. If it has some of your items, do not try to retrieve them. Don't corner a black bear; it might respond aggressively. A charge is often a bluff. If a black bear (not a grizzly) should attack you, though, fight back fiercely.

Food Handling and the Grizzly Factor

Always check first with rangers about wildlife activity in the area you are visiting. Heed whatever advice is given.

Here are food-handling tips that apply in grizzly territory; they're also smart moves in places where black bears are known to be active.

- Cook meals **100 yards away** from your sleeping site, preferably downwind.
- Opt for **freeze-dried meals** rather than more aromatic items that require more simmering and stove-top preparation.
- Avoid wiping your hands on your **clothing;** store the clothing you use while cooking with your food stash.
- **Try to avoid leftovers.** Store any exposed food item in a zippered storage bag. Double-bagging is a good idea in areas of known bear activity.
- Use **minimal soap** and **no toothpaste** in areas active with bears.
- Everything with **any kind of aroma,** edible or inedible, goes in your food stash. So do all pots, utensils and trash, especially food wrappers.
- When **washing pots** in black bear country, widely disperse the rinse water far from your sleeping area, and do so on rocks. Traces of salt may linger and marmots, rodents or goats may come along and shred plants in a search for a food-like scent.
- Before entering grizzly territory, **ask rangers for guidance** on rinse water. Sometimes they may advise you to pour it into a flowing stream. In this circumstance, consider licking your pot clean to minimize any residue.
- **Never leave food scraps behind.** This rewards animals inclined toward food-snitching. Keep a scrupulously clean camp.
- **Never, ever feed a wild animal,** no matter how cute it might be. If you do, you are disrupting its foraging instincts and rewarding unnatural behavior.
- Do NOT try to **retrieve** anything any bear has in its possession.
- Ask local rangers how to respond to a grizzly entering your camp.

Camping Contentment

At home, you probably never think about your nighttime routine before going to bed. It's all automatic: You wash up, brush your teeth, click off the light, then hop in the sack.

Things change when you bunk down in the woods, either in a campground or the backcountry. You're in an entirely new environment, one that is usually much cooler than your home, and you might feel displaced or insecure. Fret not; you can cope. Try these suggestions for assuring yourself of a good night's sleep:

Before Bed

- Eat a meal or at least a light snack before turning in for the night. The process of digestion helps you stay warm internally. It's your body, not your sleeping bag, which generates heat to keep you warm throughout the night.
- Drink up—with water, that is. Dehydration can cause a reduction in blood circulation that can leave you chilled. Having ample water in your system also helps diminish the possibility of headaches at higher altitudes.
- On chilly nights, try a little light exercise to get your blood pumping just before you hop in your bag.
- Use your sleeping bag hood or wear a warm hat. Most body heat escapes through your head.
- Use a sleeping pad to reduce contact with the cold ground.
- Avoid overdressing when you hop into your sleeping bag. Wear long underwear to fight off the chill; drape bulkier items on the outside top of your bag for an extra layer of insulation.
- Change out of any damp or sweat-soaked clothes to avoid getting chilled while in camp or as you sleep. Hang damp layers from a branch overnight.
- Store your food where animals cannot snitch it while you sleep.

Overnight

- If you're new to backpacking and are easily spooked, avoid listening too closely to the sounds around you at night. The night woods are full of strange sounds that can seem more threatening than they really are. Small critters can sound like elephants. Just accept such sounds as the standard cacophony of nature, which repeats itself every night.

Tip: If night sounds really make you nervous and cause you to lose sleep, try and camp near moving water. Rushing water's "white noise" helps mask out ambient sounds.

- Animals often come into campsites after sunset to search for food. Just remember that these animals are far more scared of you than you are of them.

- To make late-night trips to the latrine easier, place your flashlight and a pair of sandals or camp shoes near your tent door before you bunk down. If you tend to get thirsty at night, keep a supply of water nearby.

- If bad weather threatens, store your backpack underneath your tent vestibule (if you have one) or shield it with a waterproof pack cover. Make sure you don't have any food items in your backpack that might attract animals, and leave zippered compartments open overnight so animals won't be tempted to rip open your gear in search of a snack.

In the Morning

- Start each day with a good breakfast and an organizational meeting. Make sure that everyone is aware of the day's plans and the route you'll be following.

- Be sure to pack your gear according to the day's plans. Store the items you may need during the day in easy-to-reach spots.

- Approach breaking camp as a team effort. Make sure everyone contributes.

- Before departing, make a final sweep of your campsite to make sure that it is trash-free and that nothing has been left behind.

Dealing With Temperature Extremes

On the road to disaster, common sense is usually an early casualty. Somehow we talk ourselves into taking a hike on a shadeless trail when the temperature is 90 degrees and rising. On a wind-whipped winter's day, we convince ourselves to leave behind a potentially vital layer of clothing in order to save weight and bulk in our pack.

Nature is utterly indifferent to your presence in the backcountry. Human miscalculations during surges or drops in temperature may leave you vulnerable to weather-related injury or illness. The savvy wilderness traveler needs to know how to react when weather conditions move outside a human's customary comfort zone.

QUICK READ

1. Drinking water regularly is essential for safe wilderness travel in all four seasons.
2. Your body needs water before you feel thirsty.
3. Hypothermia is caused by long-term exposure to cold temperatures, not necessarily subfreezing temperatures.
4. Treat frostbite by soaking the damaged area in very warm (not hot) water.

How to Handle the Heat

In **warm conditions,** your primary concern is to **keep yourself hydrated.** On a long hike in hot weather you may need to drink a gallon of water or more. That sounds like a lot, but it's not that hard to sweat away a quart of water every hour.

Without proper hydration (which typically requires fluid intake once every 20 minutes during strenuous exercise), your blood becomes thicker, like old motor oil. Your heart then must work even harder to force blood, which could become sludgelike, to circulate through your body. This could lead to a serious heat illness known as heat stroke.

Heat Illnesses
Heat illness is a general term that refers to a range of problems caused by the overheating of the human body.

- **Heat Fatigue**—This malady is usually characterized by muscle cramps, strong thirst and sudden, extreme fatigue.
- **Heat Exhaustion**—This occurs when heat fatigue worsens. Symptoms include excessive sweating, dizziness, headache, nausea and rapid heart rate.
- **Heat Stroke**—This is the most severe kind of heat-related illness. It's an extremely serious condition involving the total breakdown of the body's heat control system. Heat stroke victims usually suffer from severe confusion, a cessation of sweating and in some cases total nervous system failure. Heat stroke can be fatal.

Prevention

- Wear only lightweight, loose-fitting, light-colored clothing.
- Drink water often, and drink the coldest water available; your stomach assimilates it more easily.
- Start hiking before sunrise and during the fading light of early evening, when temperatures are cooler.
- Rest often. If you find a shady spot around midday, take an extended break.
- Start your trip in above-average condition; pre-trip training should have your body more accustomed to rigorous demands.

Remedies

- Stop all activity and rest in a cool, shady place.
- Drink water frequently.
- If the situation is serious, have the affected person lie down with their feet elevated to keep sufficient blood flowing to the brain.
- Place anything cold in places where major arteries are located: armpits, groin, neck. Add a wet bandanna on the forehead. Fan the person.
- Seek medical attention as quickly as possible.

Dehydration

Water is life. That's a slogan you'll see posted at ranger stations and visitor centers throughout the desert southwest in the United States. The words are true. If you become dehydrated, vital organs such as your kidneys, heart and brain are liable to malfunction. It is a serious condition that demands immediate attention. The aftermath could be shock, even death.

Dehydration is loss of water and important blood sugars and salts (electrolytes) such as sodium and potassium. Vomiting or diarrhea makes a person vulnerable to dehydration, but most backcountry explorers succumb to it due to overexertion. Its symptoms include:

- Increased heart rate
- Dark-yellow urine (or no need to urinate)
- Dry mouth
- Papery skin (pinched skin remains pinched instead of flattening)
- Weakness, lethargy
- Dizziness
- Muscle cramps
- Intense thirst
- Pain in the chest or abdomen
- Impatience
- Confusion

Your blood is roughly 90 percent water. As you exercise, your muscles heat up and perspiration occurs. Sweat evaporates on your skin's surface and cools it. This allows your bloodstream to circulate cooler temperatures to your internal organs.

If you do not regularly hydrate yourself, your blood thickens and it requires more exertion from your heart to pump it through the vessels. Thus you are doing your heart a favor by keeping your body well hydrated.

Prevention

- Drink water before you feel thirsty. Your body needs water before the sensation of thirst kicks in.
- Drink more at higher elevations. At oxygen-depleted heights, you breathe more rapidly and deeply to take in oxygen. This effort, combined with the intake of drier, colder air, increases fluid loss.
- Avoid alcohol and caffeine. They are diuretics and actually hasten dehydration.
- Some medications, including antihistamines and sedatives, can contribute to dehydration. Consult your physician for guidance.
- Do not substitute soda pop for water. Your body requires the unique attributes of water in order to function properly.
- Stay rested on your trip.
- Acclimatize gradually to high elevations.
- Eat well. About 25 percent of a human's daily water intake comes from food.

Remedies

- Drink almost any nonalcoholic liquid.
- Drink cold water; the stomach assimilates cold fluids with greater ease.
- Supplement water with fluids that contain electrolytes: juices, soups, performance drinks.
- If treating a seriously dehydrated person, encourage the person to accept liquids even though he or she seems disinterested. Persuade the person to accept at least a few sips every 10 or 15 minutes.

Coping With Severe Cold

Hypothermia
Hypothermia is a significant drop in the body's core temperature caused by prolonged or sudden exposure to the cold. This potentially life-threatening condition is surprisingly common among backcountry explorers, especially those who are not familiar with its early warning signs.

Subfreezing temperatures are not essential to cause hypothermia. Prolonged exposure to cold can lead to the condition. Sudden or acute hypothermia is usually caused by immersion in very cold water, which may afflict paddlers or winter travelers who break through ice. Wind can also play a role in the loss of body heat.

Hypothermia is dangerous because it develops subtly, often without the individual's knowledge. For this reason, wilderness travelers should occasionally check their companions for symptoms. Those include shivering, slurred speech or non-communication, apathy.

Prevention

- Stay warm, dry and well hydrated during your travels.
- Eat well, particularly at night. Digestion helps generate internal warmth.
- Begin your trip at a high level of physical conditioning. Your body will benefit from its heightened ability to circulate blood efficiently.
- If you have access to a fire or a heat source, position yourself so your body's "core" (the area between your lower chest and mid thighs) is closest to the heat. That is your body's furnace; it will help carry heat to your extremities.

Remedies

- Seek shelter.
- Warm your environment with heat from a fireplace, stove or furnace; inhaling warmed air benefits a victim.
- Remove wet clothing; replace it with warm items, including a head covering.
- Consume warm food and beverages.

Frostbite

Frostbite, the condition of skin freezing to a point where damage may be lasting, is a significant cold-weather hazard. When afflicted, the skin will have an ashen appearance and exhibit an odd discoloration and hard texture.

Remedies

- Seek shelter.
- Place the afflicted area in warm (not hot) water; sustain this activity for 30 minutes or more, even if this causes the victim some discomfort.
- Do not massage the afflicted area.
- Do not use a fire to thaw the damaged area.
- Do not allow treated areas to refreeze.

How to Choose Daypacks

Daypacks today are a highly evolved species, transformed from their Pleistocene-era origins (shapeless bags of canvas, cloth or cowhide attached to a pair of unsympathetic, unpadded shoulder straps) into efficient, specialized, high-performance load-carriers.

Name your activity. Whatever it is, it's likely a daypack has been designed to help you enjoy it with greater ease and convenience.

1. Choose a daypack with enough capacity to handle the most demanding situations you expect to encounter.
2. Many daypacks effectively serve two purposes: transporting books at school, then carrying gear on the trail.
3. Climbers, snowboarders and telemark skiers often use specialized packs for day trips.
4. Hydration daypacks make it possible for you to take a drink without dropping your pack to dig out a water bottle.
5. Fanny packs and lumbar packs are ideal for minimalists or trail runners who want to keep their loads light.

Matching Packs With Your Activity

Day Hiking: Any pack listed as a day packs, rucksacks, school packs, even computer packs will work for day trippers. Make sure the one you choose includes certain features you value the most—a large capacity rating, side pockets, compartments for organizing gear, etc.


day hike

Evaluate your ambitions and expectations. For instance, will your pack get as much use (or more?) at school as it will on the trail? Then steer yourself toward a larger-capacity book bag. Plan to do a little scrambling when you're out for a walk? Consider some packs with thinner profiles such as those listed under climbing packs.

Quick Backcountry Overnighters: Your best options will be found either under rucksacks (larger-capacity daypacks without frames) or smaller-capacity internal-frame packs.


overnight

If you are equipped with a space-saving down sleeping bag, a pack with a capacity of roughly 2,500 cubic inches can accommodate enough gear for a comfortable overnighter.

The best of these packs typically offer padded backing (or some type of framesheet), a modest lumbar pad and a padded (though not necessarily beefy) hipbelt. Some models offer a single aluminum stay to help accommodate a heavier load. However, if you require lots of amenities (even during an overnight trip), consider instead a lower-volume internal-frame pack. These models will allow you to carry a heavier load more efficiently.


short climb

> **Tip**—Typically, you do not want to exceed 20 pounds in a daypack if it offers no framesheet for your back or hipbelt. Otherwise, the weight may hang too heavily on your shoulders. Some rucksacks provide a modestly padded hipbelt. If that's a feature you want, make sure the belt is something more substantial than a simple stabilizing strap made from webbing.


ski

Scrambling: Stick with a narrow-profile pack, one that includes a padded back or a framesheet. A hipbelt and a sternum strap will be especially helpful. Often you'll be climbing to higher elevations where the air is cooler, so you'll need a capacity of around 2,500 cubic inches (or more) to accommodate extra clothing.


school

Climbing: Your ambitions will determine whether you need a low-capacity internal-frame pack or a technical daypack. Compare your standard equipment load (ropes, carabiners, etc.) with the list of specialized features a pack may provide (ice axe loop, crampon patches, daisy chain).

Avoid side pockets; you want a pack that's lean and clean. A sternum strap and a variety of compression straps (which consolidate your load and keep it from shifting) are also important. Ask your climbing companions what works for them.

Ski Touring: A smooth, narrow profile is a must. Your range of travel (and the extra clothing you customarily carry) will determine your capacity requirements. Look for wand pockets on the sides of the pack; they come in handy when carrying your skis. A sternum strap is essential; a hipbelt of some type will serve you well. Climbing packs work very well for touring or telemarking.

Trail Running: A fanny pack, lumbar pack or water-bottle pack is your first choice. Lumbar packs are less inclined to shift while you run, and it's nice to keep your back clear so perspiration can escape. In cooler times of year, a hydration pack (which offers more capacity to carry additional clothing) makes a good choice.

School: Daypacks have largely replaced briefcases in the past quarter-century. Somewhere along the line "daypacks" morphed into "school packs," and pack manufacturers have kept pace with the trend. If toting books, not gear, is your primary interest, look for school packs that offer at least one divider, two compartments, or an organizer.

REI's brand of school packs have earned a good buzz for featuring the REI "Obsessive Organizer," a well-conceived interior panel amply equipped with pockets, slots and sleeves to help you manage everything from pens to CDs to airline tickets.

Some packs, like the Yahoo! Hardware line, include padded cases for laptops that can be removed and carried separately. A carry handle is a nice option for warmer days when you want to keep your back clear. Plus, these packs easily transform into outdoor-minded gear carriers on weekends.

Specialized Packs

Hydration Packs: People love hydration packs—standard-sized daypacks that include a removable reservoir (or bladder) with a sipping hose attached. With the drinking end of the hose clipped to one shoulder strap for easy access, you can go for miles without dropping your pack when you need a drink


hydration

The simplicity of their design encourages you to hydrate more often, which is a good thing. Sometimes, in order to maintain a pace, you postpone a drink stop because that's the last thing you want to do—stop. Hydration systems (found in many full-sized backpacks as well) can keep you refreshed while you keep moving.

Fanny Packs: These are nice items for day hikers, cyclists, skiers, even city strollers. For shorter outdoor jaunts on hotter days, a fanny pack and the full ventilation it affords your back is a great option.


fanny pack

Lumbar Packs: These are larger-capacity fanny packs that ride on the small of your back as well as your waist. Their snug design is very popular with trail runners.


lumbar

Additional Considerations

Panel Loaders vs. Top Loaders. Traditionally, many daypacks feature a panel-loading style, where the main storage compartment is accessed via a long, U-shaped zipper. Fully opened, one side wall of the compartment falls away like a flap. This wide opening makes it easy to pack bulky items such as cold-weather clothing or books.

Top loaders usually do a better job of keeping loads from shifting, especially if they offer compression straps. For activities where balance is vital (climbing, ski touring, scrambling), give a top loader some serious consideration. Just recognize that organizing gear in a top loader (where something important is always on the bottom) is a greater challenge.

Little Extras: You know your own preferences. Manufacturers have tried their best to accommodate the ones shared by the most people. So read through each description in search of specialties that are close to your heart, from ski slots to key loops to a carry handle. Think through all your potential needs before you make your selection.

Sources for Gear

There are a number of good outfitters in the San Jose area. Some that I have used include:

- REI – on Saratoga at Lawrence Expressway
- Mel Cotton's – West San Carlos Street

You can also find some deals at regular sporting good stores (Sportsmart, Wal-Mart, Big 5, etc.)

The Internet has really changed shopping for backpacking equipment. Some sites to consider include:

- altrec.com
- backcountrystore.com
- campmor.com
- gearpro.com
- mgear.com
- moosejaw.com
- rei.com and rei-outlet.com
- summithut.com
- travelcountry.com
- thru-hiker.com (specializes in ultra-light equipment)
- backpacking.net (specializes in ultra-light equipment)

If you shop these websites, you can almost always find what you want and frequently get it for a discount. Many of the stores run specials or clearances. I rarely buy anything at full price. If your do a little looking, you can usually find a deal – and on high quality equipment. To the chagrin of my wife, my backpacking equipment has expanded over the past years principally because of the number of "good deals" available.

Places to Go

Living in Northern California gives us many options on backpacking destinations – we have some of the best backpacking in the country anywhere from a few minutes to a few hours from our homes.

When I became Scoutmaster, I reintroduced my troop to backpacking – they had been several years since their last backpacking trip. We started out slow – our first month's activity was a short half-mile hike into our campsite in the Marin Headlands. The next month's activity was a couple mile hike into our campsite at Castle Rock State Park. The next month we went to Big Basin Redwoods State Park for a hike along the Skyline to the Sea Trail. Each successive hike was longer, more up and down, and provided us with learnings of what to bring and what not to bring.

At our weekly Troop Meetings, we had programs on gear, cooking, water treatment and other backpacking topics. From these meetings and our monthly activities, the scouts got a good background on backpacking – I feel confident that my scouts are equipped to do well on more high adventure trips. This past summer, the older scouts went on a week long backpacking trip in the Sierra Nevada – they had a great time.

Subsequently, we have hiked at Yosemite and the Trinity Alps.

As you plan your trips, you may want to consider –

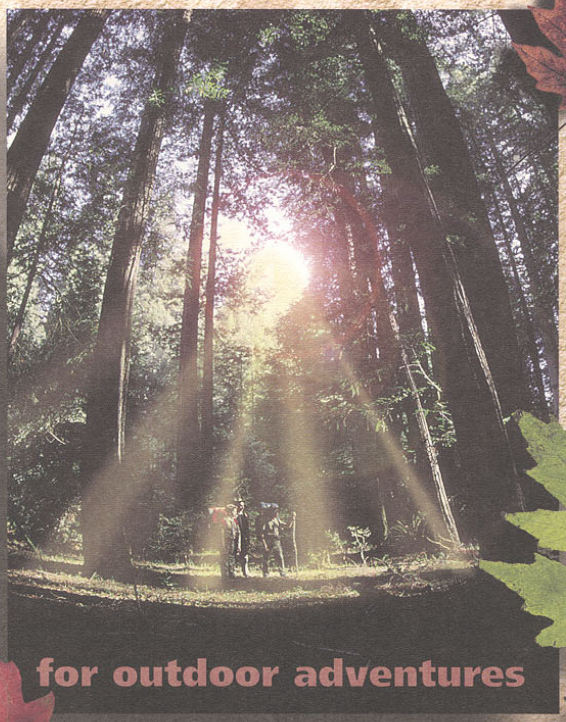
- Sierra Nevada
- Cascade Mountains
- Klamath Mountains
- Coast Range and North Coast
- Big Sur
- Santa Cruz Mountains (there are a surprising number of good local hikes)

There quite a few good books that outline Northern California backpacking trips. A few that I can recommend are –

- *100 Classic Hikes in Northern California*
- *Guide to the John Muir Trail*
- *Trekking California*
- *Backpacking California*
- *101 Hikes in Northern California*
- *100 Hikes in Yosemite National Park*
- *Hiking and Backpacking Big Sur*

the principles of

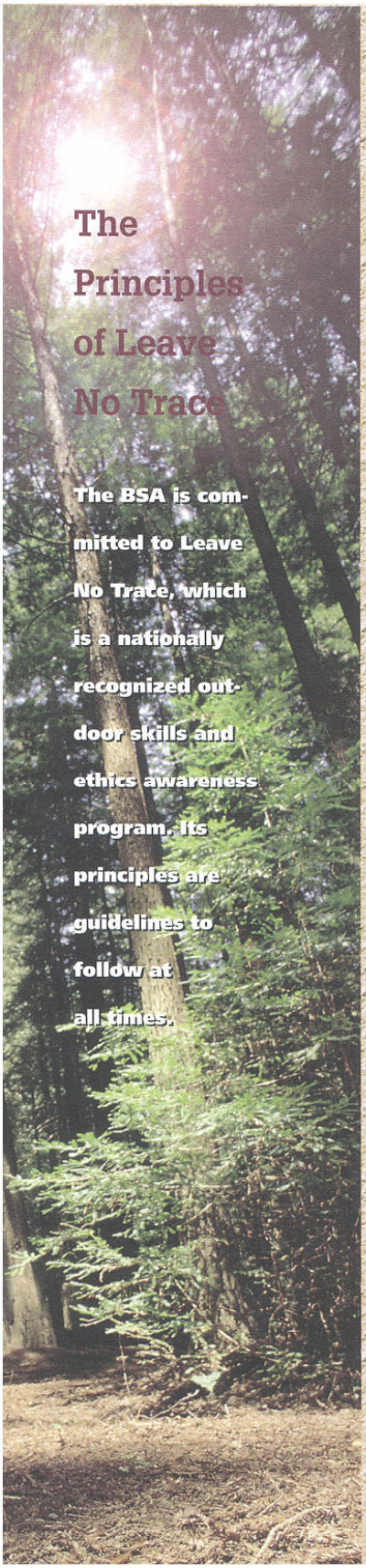
Leave No Trace



for outdoor adventures

BOY SCOUTS OF AMERICA

This flier can be downloaded from the BSA Web site: *http://www.bsa.scouting.org*



The Principles of Leave No Trace

The BSA is committed to Leave No Trace, which is a nationally recognized outdoor skills and ethics awareness program. Its principles are guidelines to follow at all times.

The Leave No Trace principles might seem unimportant until you consider the combined effects of millions of outdoor visitors. One poorly located campsite or campfire may have little significance, but thousands of such instances seriously degrade the outdoor experience for all. Leaving no trace is everyone's responsibility.

Leave No Trace Awareness

Instilling values in young people and preparing them to make ethical choices throughout their lifetime is the mission of the Boy Scouts of America. Leave No Trace helps reinforce that mission, and reminds us to respect the rights of other users of the outdoors as well as future generations. Appreciation for our natural environment and a knowledge of the interrelationships of nature bolster our respect and reverence toward the environment and nature.

Leave No Trace is an awareness and an attitude rather than a set of rules. It applies in your backyard or local park as much as in the backcountry. We should all practice Leave No Trace in our thinking and actions—wherever we go.

We learn Leave No Trace by sharing the principles and then discovering how they can be applied. Leave No Trace instills an awareness that spurs questions like "What can we do to reduce our impact on the environment and on the experiences of other visitors?" Use your judgment and experience to tailor camping and hiking practices to the environment where the outing will occur. Forest, mountain, seashore, plains, freshwater, and wetland environments all require different minimum impact practices.

Outdoor Ethics

Help protect the backcountry by remembering that while you are there, you are a visitor. When you visit a friend, you take care to leave your friend's home just as you found it. You would never think of trampling garden flowers, chopping down trees in the yard, putting soap in the drinking water, or marking your name on the living room wall. When you visit the backcountry, the same courtesies apply. Leave everything just as you found it.

Hiking and camping without a trace are signs of an expert outdoorsman, and of a Scout or Scouter who cares for the environment. Travel lightly on the land.

Learn More About Leave No Trace

More information about Leave No Trace can be obtained by contacting your local land manager or local office of the Bureau of Land Management, the Forest Service, the National Park Service, or the Fish and Wildlife Service. (Check the blue pages of your local telephone directory.) Or, contact Leave No Trace toll free at 800-332-4100 or on the Internet at **http://www.lnt.org.**

For posters, plastic cards listing the Leave No Trace principles, or information on becoming a Leave No Trace sponsor, contact Leave No Trace Inc., P.O. Box 997, Boulder, CO 80306; phone 303-442-8222.

1. Plan Ahead and Prepare

Proper trip planning and preparation helps hikers and campers accomplish trip goals safely and enjoyably while minimizing damage to natural and cultural resources. Campers who plan ahead can avoid unexpected situations, and minimize their impact by complying with area regulations such as observing limitations on group size. Schedule your trek to avoid times of high use. Obtain permits or permission to use the area for your trek.

Proper planning ensures

- Low-risk adventures because campers obtained information concerning geography and weather and prepared accordingly
- Properly located campsites because campers allotted enough time to reach their destination
- Appropriate campfires and minimal trash because of careful meal planning and food repackaging and proper equipment
- Comfortable and fun camping and hiking experiences because the outing matches the skill level of the participants

2. Travel and Camp on Durable Surfaces

Damage to land occurs when visitors trample vegetation or communities of organisms beyond recovery. The resulting barren areas develop into undesirable trails, campsites, and soil erosion.

Concentrate Activity, or Spread Out?

- In high-use areas, campers should concentrate their activities where vegetation is already absent. Minimize resource damage by using existing trails and selecting designated or existing campsites. Keep campsites small by arranging tents in close proximity.
- In more remote, less-traveled areas, campers should generally spread out. When hiking, take different paths to avoid creating new trails that cause erosion. When camping, disperse tents and cooking activities—and move camp daily to avoid creating permanent-looking campsites. Avoid places where impacts are just beginning to show. Always choose the most durable surfaces available: rock, gravel, sand, compacted soil, dry grasses, or snow.

These guidelines apply to most alpine settings and may be different for other areas, such as deserts. Learn the Leave No Trace techniques for your crew's specific activity or destination. Check with land managers to be sure of the proper technique.

3. Dispose of Waste Properly (Pack It In, Pack It Out)

This simple yet effective saying motivates backcountry visitors to take their trash home with them. It makes sense to carry out of the backcountry the extra materials taken there by your group or others. Inspect your campsite for trash or spilled foods. Accept the challenge of packing out all trash, leftover food, and litter.

Sanitation

Backcountry users create body waste and wastewater that require proper disposal.

Wastewater. Help prevent contamination of natural water sources: After straining food particles, properly dispose of dishwater by dispersing at least 200 feet (about 80 to 100 strides for a youth) from springs, streams, and lakes. Use biodegradable soap 200 feet or more from any water source.

Human Waste. Proper human waste disposal helps prevent the spread of disease and exposure to others. Catholes 6 to 8 inches deep in humus and 200 feet from water, trails, and campsites are often the easiest and most practical way to dispose of feces.

4. Leave What You Find

Allow others a sense of discovery, and preserve the past. Leave rocks, plants, animals, archaeological artifacts, and other objects as you find them. Examine but do not touch cultural or historical structures and artifacts. It may be illegal to remove artifacts.

Minimize Site Alterations

Do not dig tent trenches or build lean-tos, tables, or chairs. Never hammer nails into trees, hack at trees with hatchets or saws, or damage bark and roots by tying horses to trees for extended periods. Replace surface rocks or twigs that you cleared from the campsite. On high-impact sites, clean the area and dismantle inappropriate user-built facilities such as multiple fire rings and log seats or tables.

Good campsites are found, not made. Avoid altering a site, digging trenches, or building structures.

5. Minimize Campfire Impacts

Some people would not think of camping without a campfire. Yet the naturalness of many areas has been degraded by overuse of fires and increasing demand for firewood.

Lightweight camp stoves make low-impact camping possible by encouraging a shift away from fires. Stoves are fast, eliminate the need for firewood, and make cleanup after meals easier. After dinner, enjoy a candle lantern instead of a fire.

If you build a fire, the most important consideration is the potential for resource damage. Whenever possible, use an existing campfire ring in a well-placed campsite. Choose not to have a fire in areas where wood is scarce—at higher elevations, in heavily used areas with a limited wood supply, or in desert settings.

True Leave No Trace fires are small. Use dead and downed wood that can be broken easily by hand. When possible, burn all wood to ash and remove all unburned trash and food from the fire ring. If a site has two or more fire rings, you may dismantle all but one and scatter the materials in the surrounding area. Be certain all wood and campfire debris is dead out.

6. Respect Wildlife

Quick movements and loud noises are stressful to animals. Considerate campers practice these safety methods:

- Observe wildlife from afar to avoid disturbing them.
- Give animals a wide berth, especially during breeding, nesting, and birthing seasons.
- Store food securely and keep garbage and food scraps away from animals so they will not acquire bad habits. Never feed wildlife. Help keep wildlife wild.

You are too close if an animal alters its normal activities.

7. Be Considerate of Other Visitors

Thoughtful campers respect other visitors and protect the quality of their experience.

- Travel and camp in small groups (no more than the group size prescribed by land managers).
- Let nature's sounds prevail. Keep the noise down and leave radios, tape players, and pets at home.
- Select campsites away from other groups to help preserve their solitude.
- Always travel and camp quietly to avoid disturbing other visitors.
- Make sure the colors of clothing and gear blend with the environment.
- Respect private property and leave gates (open or closed) as found.

Be considerate of other campers and respect their privacy.

APPLICATION FOR

Leave No Trace Awareness Award

(Submit this application to your local council service center.)

Local council name _____ Headquarters city/state _____

Unit type and No. _____
Troop, team, post, crew

Number of awards: Youth _____ Adult _____

Unit leader's name _____ Phone No. _____

Address _____

City _____ State _____ Zip _____

Names of Scouts or Venturers

_____ _____

_____ _____

_____ _____

Names of Scouters or Venturing Leaders

_____ _____

_____ _____

The Scouts, Scouters, and/or Venturing leaders indicated above have fulfilled the requirements for the Leave No Trace Awareness patch, No. 8630.

Unit leader's signature _____ Date _____

SCOUT AND VENTURER REQUIREMENTS

1. Recite and explain the principles of Leave No Trace.
2. On three separate camping/backpacking trips demonstrate and practice the principles of Leave No Trace.
3. Earn the Camping and Environmental Science merit badges (Boy Scouts), or complete No. 3 under the Scouter and Venturing leader requirements (Venturers).
4. Participate in a Leave No Trace–related service project.
5. Give a 10-minute presentation on a Leave No Trace topic approved by your Scoutmaster.
6. Draw a poster or build a model to demonstrate the differences in how we camp or travel in high-use and pristine areas.

SCOUTER AND VENTURING LEADER REQUIREMENTS

1. Recite and explain the principles of Leave No Trace.
2. On three separate camping/backpacking trips demonstrate and practice the principles of Leave No Trace.
3. Share with another Scouter or Venturing leader your understanding and knowledge of the *Camping* and *Environmental Science* merit badge pamphlets.
4. Actively assist (training, advice, and general supervision) a Scout in planning, organizing, and leading a service project related to Leave No Trace.
5. Assist a minimum of three Scouts in earning the Leave No Trace Awareness Award.
6. Plan and conduct a Leave No Trace awareness for Scouts, Venturers, Scouters, or an interested group outside Scouting.

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