

CAPACITY:

How big of a pack do you need? It all depends on how much gear and food you need to carry. These, in turn, are functions of how many days you'll be out, what season you travel in, and how many luxuries you choose to carry. The result: one person's weekend pack may be another's weeklong pack. Use the following general guidelines:

- **Less than 3,000 cubic inches:** This size makes a great high-volume daypack for winter or mountaineering, or an ultralight overnight pack for warm weather camping. This is too small & is not suitable for snow camp.
- **3,000-3,999 cubic inches:** You'll find this size ideal for three-season weekend trips. They'll hold all the camp essentials plus warm clothes and enough food for a couple of days. A little too small for this course.
- **4,000-5,999 cubic inches:** If you own only one pack, this is your size. It is suitable for a week or more on the trail and for winter weekends. This is a good sized pack for snow camp and for most backpacking trips.
- **6,000-plus cubic inches:** These monster packs are best for multi-week treks or gear-intensive winter outings.

FRAME TYPE:

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

External-Frame Packs:

Externals connect a packbag to a rigid frame made of metal or molded plastic. 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.



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 disadvantages 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 trunk 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.

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 1/8-inch thick. Stays are usually aluminum and are configured in a V-shape. Alternative frame materials (such as composites) and stay-alignments (parallel, X-shaped; U-shaped) are sometimes used. Stays are removable and can be shaped to conform to your torso.



Internals are popular packs with many advantages:

- **Flexibility.** Stays make internals stiff, but not rigid. This allows the pack to 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 disadvantage 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.
- **Poor ventilation.** 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.

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, ultralight mountaineers, rock scramblers and peak-baggers. Dave's Cold Cold World pack is a rucksack. This kind of a pack would be unsuitable to take to snow camp, but serves as an excellent daypack.

FEATURES:

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.

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.

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.

Suspension system: This involves the shoulder straps (padded and contoured), load-lifting straps, a sternum strap and belt-stabilizer straps. The more fine-tuning a pack permits, the better the fit.

Packbags: Common materials are nylon packcloth and Cordura®, a burly nylon fabric with a brushed finish. 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. This is nice 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 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 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: Women's packs, both internal and external, are designed 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.

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:

- Have a friend help you out. 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.



How to Pack:

Start with your sleeping bag in the bottom for a solid foundation. Put the heaviest items like your clothing, food, and cooking gear in the main compartment, keeping the weight close to your back, nearest your center of gravity. For men, this is higher, and for women it tends to be lower, towards the small of the back. Have fun with leashes and straps and be creative attaching the rest of the junk such as snowshoes, poles, shovel, tent, etc. on your pack. Just remember to think in terms of practicality and weight distribution: what items will you be accessing more, and when will you be accessing them.

