The Ultimate Ultralight Backpacking Book

Hike Light - Have More Fun

Version 1.1

www.hikelight.com

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Chapter 1: What is ultralight hiking? Why should I hike light?

The answer most ultralight hikers would give is: It's more fun. Lightweight backpackers typically say they feel free, close to nature, and enjoy not having the burden of a heavy pack.

Lightweight hiking typically is not "fast packing" or covering as many miles as possible. It's about hiking at the pace you like and enjoying it a lot more. The simplicity of ultralight hiking allows you to spend more time on the trail seeing more of the beauties of nature. And the lighter weight means you end even high mileage days feeling stronger and more refreshed. Lighter packing weights leave your feet and legs with far less soreness and fatigue.

Many people are forced into lighter packs by age or injury, but more and more young backpackers are discovering the common sense freedom of lighter packs. Long distance hikers often start out with their "old" heavy packs, but are quickly converted to the joys of lightweight hiking after the first few days on the trail. Weekend hikers can recover from heavy loads, but thru hikers need to make better plans.

Weekend hikers might as well learn from the experience of others. It makes sense that you'll have more fun on any hike when you're carrying less. Think of the freedom you feel with a day pack. Then think of the weight you usually carry when hiking and camping for one night or longer. Wouldn't you like to be close to that day hike weight when you're on extended hikes?

All backpackers are concerned about comfort, safety, and cost of equipment. That doesn't have to keep them from hiking lighter. Switching to a lighter piece of gear might seem like a tradeoff in comfort, but most changes are easy to make and don't require giving up any comfort at all. For instance, you may be carrying a pocket knife that weighs five ounces. A simple five ounces doesn't seem like a killer on your back, and by itself it's not. But chances are you're not using that knife for any really heavy tasks, so why not carry a quality knife that weighs less than one ounce?

With one tiny change you're lighter with no loss in comfort, and you're carrying less volume. And if you can reduce volume as well as weight, it helps in your final efforts to work your way down to the lightest comfortable pack for you. A smaller, frameless pack is more convenient to bring inside your tent. And a small pack makes it easier to find any item you're looking for.

You don't need to compromise safety to pack light. One of the first things you'll notice with a light pack is you're more agile. You're less apt to roll and ankle or get off balance and fall. You can hike quickly to more protected areas if there's threatening weather.

Some lightweight items actually cost less than their heavier counterparts. Your pack can be less expensive because it's the smaller version of a series. Things like your knife, compass, flashlight, and stove can be smaller, cheaper, but full-functioning versions. Much of your weight savings is just planning what to leave home. A good example is your cook kit. You may be using only the kettle to heat water for your meals, so there's no need to take the frying pan and dish. You've cut your weight by more than half by just leaving it home.

This all leads to planning which is at the core of lightweight backpacking. It might seem tedious to those who don't like to make lists or get technical with details. But most of the changes you'll make are things that you'll only have to do once. From that time forward, you'll enjoy the benefits of every little change. Even the box you store your gear in at home will be smaller and simpler.

Planning helps you avoid last-minute packing, too. Often those last few things you grab before you leave home, like unnecessary clothing, add extra pounds to your pack.

There will be some expense to make these changes, but you'll enjoy the advantages forever. For some, there can be an actual savings because the first thing you should do is quit buying and carrying "cool" things you don't really need. It's easy to walk through a backpacking store and grab items that will have you carrying a 70-pound pack. Resist the urge! No more impulse buying.

Most backpackers carry extra weight because they use gear that manufacturers make "bombproof." That may sound good, because it sounds safer. But those heavy materials are usually there because the companies don't ever want to see returns, even from hikers who are ridiculously hard on their gear. So it's easier to make the gear from heavy materials that can never break. And some of those heavier materials are cheaper because they're more common.

All lightweight backpackers will tell you the greatest savings can be made on your three heaviest items -- your pack, tent, and sleeping bag. You often hear those who hike light talk about their “system.” They use that term because it all has to work together. You can’t pack a lot of bulk into a small pack. So you’ll get the most benefit when you reduce the tent and sleeping bag weight and volume when you choose your new pack. When you choose the pack, don’t buy one that’s too big in volume. You’ll feel the need to fill it. Instead, keep feeling the need to reduce weight and volume.

Packs are an item on which individual backpackers have a wide variety of needs and likes. Try to find the light ones that have the features you want. After ordering your pack, fill it with gear and walk around to see if you have the right fit. There are packs that weigh from one to two pounds. For the lightest backpackers, you can even have a pack that’s less than a pound.

Most hikers carry a sleeping bag that’s overkill for summer use. Since they’ve purchased for the worst possible conditions, they carry too much weight for long hikes and end up roasting in their bags on most nights. You can have a sleeping bag that is comfortable to 35 degrees and weighs only one pound or one that’s good to 20 degrees and is just one pound 10 ounces. Down sleeping bags are the lightest and can be compressed better than synthetic bags. Don’t avoid down bags because you’ve heard they don’t function when wet. All bags are miserable when wet. Just increase your expertise in keeping the bag dry. Quality down bags have extremely tight weaves that are very resistant to moisture.

There are a wide variety of tents and tarps that can reduce your shelter weight to one to two pounds. At less than 2 pounds you can have full bug and rain protection. So, your “big 3,” the pack, tent, and sleeping bag can weigh 4 to 5 pounds. Add an ultralight stove, lightweight rain gear, and a light sleeping pad and the total weight of 6 of your most important items is still less than your old 7-pound pack! That should be enough incentive to inspire any backpacker.

Since you lift your feet with every step, wearing lightweight running shoes can save more energy than any other item. Experiment with a pair that fit your arch well and give you good support. Don’t fall into the trap of thinking you need a pair of boots because you’re hiking. Lighter loads reduce your chances of severe ankle sprains. An ankle sprain in boots can give you a high ankle sprain that’s worse than a sprain in running shoes. In warm weather, you don’t need waterproof shoes. Regular running shoes breathe best and dry out quickly after stream crossings. In wet areas and cool seasons, you may want a pair of lightweight hiking shoes (not boots) that are waterproof.

Calculate the weight of your clothing, too. It's part of what you're carrying. Synthetic clothing is lighter and since it dries faster, it's safer.

Water is vital when you're hiking, but you can stay well hydrated and carry less weight by just reading your map carefully and knowing where the next water is located.

Start lightening your load by spreading the contents of your pack in front of you. Take a pad and pencil and start taking notes. What's too heavy? What's overkill for summer use? What can be left home? Look at the small items, too. Where can you make the quickest, easiest changes? Where can you make the quickest, inexpensive changes? You can make a big difference when you save weight on lots of small pieces of gear. Consider buying an inexpensive digital scale that weighs in 1/10 of ounce increments. Seeing the actual numbers will be an eye opener. If you're carrying 30 pounds or more, you can cut your carrying weight by more than half! And you can do it in total comfort. That will make every outdoor adventure more fun.
Hiking light can get you back to the essence of backpacking – light, carefree outdoor travel.

Chapter 2: 201 Ultralight Backpacking Tips

An ultralight backpack means more fun. Enjoy floating down the trail instead of hauling heavy gear. You can have an ultralight backpack if you mercilessly analyze every piece of gear in your pack. Here are 201 tips to consider for reducing the weight of your pack. Some are big, some are small. That's part of the secret. Small things add up. The old and obvious are mentioned because they are some of the most important. Have fun being a fanatic. If your friends make negative comments, invite them to lift your pack and compare it to theirs. Think of these tips as a buffet, and take what you like:

1. Buy a digital scale. You can find a good one that measures down to 1/10 ounce for about $30. You'll be surprised at the weights of some items. You can take your light, portable scale into stores and make wise decisions before you buy. Do not fear sales people with little or no knowledge of the backpacking gear they're selling. You're now in control. Let them fear you.

2. Remove the excess weight from your body. Losing those unwanted pounds is probably the best weight reduction you can make. It doesn't involve leaving any of your favorite equipment home. You'll feel better, and there's a net gain in strength and endurance.

3. It needs to be mentioned at least once. If you don't need it, leave it home.

4. Avoid last-minute packing. If you hurry and pack at the last minute, you're more likely to throw in things like extra clothing you don't need.

5. If you're backpacking with a companion, plan ahead and share the weight of the gear such as the tent and cooking gear.

6. Develop your sewing skills. Be creative. Some of the best, and most inexpensive, ultralight backpacking gear is the kind you make yourself.

Pack

7. Purchase a light backpack. Your pack is one of the best places to lighten up. You'll need to reduce the volume and weight of every piece of gear to use the lightest pack. Your final result can be a pack that weighs less than 2 pounds. That's a savings of more than 5 pounds over the big "load monster" packs.

8. Don't buy a pack with too much capacity. You'll be too tempted to fill it, and it won't handle as smoothly if it's partially filled.

9. Try using your pack without the hip belt. You might like it better.

10. Remove your pack's sternum strap if you don't use it.

11. Remove any manufacturer tags from the bag. In fact, remove tags from all your gear, including clothing. Save the care instructions from the clothing if you can't remember how they're to be washed.

12. Cut some of the length from the waist belt and straps on the pack. Remember to leave them long enough for when you're wearing your bulkiest clothing.

13. If the pack has aluminum stays, or some other reinforcing material that can be removed, try carrying the pack without it. The really light pack you end up with shouldn't need reinforcing. Think positively from the outset.

14. If your pack has large buckles or cord locks, find a way to replace them with lighter ones.

15. Don't worry too much about the lighter materials in ultralight packs. These materials are still very strong. You can make repairs that are lighter than tape by using McNett Seam Grip. It works for sleeping bags, tents, and other gear, too.

16. If you need a pack cover, use one that's very light, like the ones that are made from 1.3 ounce silicone-coated nylon. Or, use a lightweight garbage bag. Or, spray your pack with a waterproof coating. Your pack may already be waterproof. Check the manufacturer's specifications. You might be able to save the weight of a pack cover.

17. Ultralight compression stuff sacks can help you reduce the volume of your gear. You may be able to lower your overall weight by using compression bags because you end up with a smaller pack.

Sleeping Gear

18. Buy a sleeping bag that isn't "overkill." It's surprising how many people buy a sleeping bag for low temperatures and then use the bag for summer camping 95% of the time.

19. Use a down bag. Nothing is more efficient for the weight. Don't worry too much about the down getting wet and losing its efficiency. High quality bags are made with shell fabrics that have a very tight weave and are very water repellent, so they tend to protect the down. The down itself has natural oils in it. It works for the geese. Use your skills to keep your bag dry. Keep it in a waterproof stuff sack.

20. Have a small towel handy to wipe any condensation from tent walls. That will help your ultralight sleeping bag perform to its maximum.

21. A piece of very light and thin painter's tarp plastic or a light trash bag can be used to keep condensation off the foot of your sleeping bag. The plastic or trash bag can have multiple uses such as keeping gear dry.

22. With a lightweight bag you can always add layers of clothing for extra warmth.

23. You can also use a silk liner that adds warmth and weighs as little as 4 ounces.

24. Switch your stuff sack for an ultralight one that's made of 1.3 oz. silicone-coated nylon. They weigh as little as .6 ounces.

25. Keep your sleeping bag clean. That will keep the efficiency high.

26. Keep your sleeping bag in a large storage bag when it's at home so it will retain its full loft and maximum efficiency.

27. Air out your bag during lunch and as quickly as possible after you set up camp. Moisture can evaporate and the bag can fully loft.

28. Eat and drink before going to bed. That will help your body to efficiently heat your sleeping bag.

29. If your feet get a little cool, you can use things as light as plastic newspaper bags or grocery sacks to keep them warm. You can use the bags for dual purpose tasks, and they add hardly any weight. They can also be used for bringing wet gear and boots into the tent. The sleeping bag stuff sack can be used as a foot warmer.

30. Using an ultralight air mattress can reduce your pack weight and volume and increase your comfort. They can be as light as about 20 ounces for a full-length mattress.

31. You can have an air mattress with insulation in the tubes for only about 1 ounce more.

32. Leave any inflatable sleeping pad open as much as possible so the condensation inside will evaporate.

33. A closed-cell foam pad is light and easy to use. You can even cut away areas that you don't need to save a few ounces.

34. The lightest air mattress available is called a balloon bed. No joke. The shell can be made from 1.3 oz. (or lighter) silicone-coated ripstop nylon. Sew 7 tubes (or more or less) into the 60" long fabric. Leave the ends open for inserting and removing the balloons. Insert Qualatex 60" balloons (model 260Q) because they're the strongest. Use clear or white since they're stronger than colored ones. The balloon bed can weigh less than 4 ounces. A pump can weigh 1.3 or 2.2 oz. Each night you'll need to use new balloons, so figure 8 per night. Eight balloons weigh .4 ounces. This figures one for breakage. They don't pop when you lay on them, but may pop when you tie them off. See more at www.balloonbed.com. Or make your own and get balloons and a pump at www.tmyers.com, www.larocksmagic.com, or others.

35. You can go crazy and use bubble wrap for your sleeping pad if you don't need too much insulation or cushion. It'll weigh about 4 ounces. There's a variety that's made with some nylon that is much stronger than the cheapest kind, but the bubbles still pop when you concentrate your knees or elbows directly on a small area.

36. Ultralight backpackers have come up with a lot of ideas for lightweight pillows. One of the most common is using your extra clothing for a pillow. One place to contain the clothing is in your sleeping bag stuff sack.

37. When you pack ultralight, you often don't have much in the way of extra clothing. Some hikers use their pack for a pillow. It solves a second challenge of where to put your pack in the tent.

38. A small piece of foam with some of your gear underneath can serve as a pillow.

39. At .4 oz. you can get a pillow at Office Depot. It's a 10 x 12" air wrap plastic packing "bubble" that you can blow up and deflate with a straw.

Shelter

40. You can save a lot of weight by choosing an ultralight tent that weighs two to three pounds for the two-person tent, or less than two pounds for a one-person tent.

41. If you usually backpack with a companion, consider buying a one-person tent for those times you go solo.

42. If you already use hiking poles, you can save the weight of tent poles on some tents.

43. If you have an old tent you'd like to keep, you can save weight by replacing the poles with lighter carbon fiber poles.

44. If you have an old tent that you like which has a fly, you can save weight by using the old fly as a pattern and sewing a new fly from 1.3 oz. silicone-coated nylon.

45. You can save weight by using titanium tent stakes. The 6" titanium stakes are just .2 ounces each.

46. Save weight by leaving stuff sacks home. A few rubber bands around your tent are lighter than the stuff sack. Put rubber bands around the titanium stakes and band them to the poles to keep the stakes from poking holes in anything.

47. In some dry regions, you may be able to use a bivy sack or sleeping bag cover as your only shelter.

48. If you need bug protection only, the pop-up bug bivies weigh only 6.5 ounces.

49. For an even lighter solution to bugs, a square yard of no-see-um netting weighs less than an ounce.

50. Simple, lightweight tarps can reduce your shelter weight to a pound or less.

51. If you use a bivy, tarp, or poncho/bivy, you may want to have a mosquito head net to keep the bugs away. Of course, these can be used during the day, too. They weigh only .6 oz.

52. Some tarps serve a dual purpose by doubling as your poncho, too.

53. Creative cord tying from a tree or using an available stick with some tarps and tents can save the entire weight of poles.

54. The lightest ground cloth is the one you don't take. Use caution when you set up your tent so you don't need a ground cloth.

55. If you use a ground cloth, use one that's a light as possible. An ultra-thin 99-cent plastic painter's cloth is a light disposable option. Some people like Tyvek. Consider using 1.3 oz. silicone-coated nylon for your ground cloth.

56. If you use a ground cloth, be sure to trim it a couple of inches smaller than your tent. If it's bigger than your tent, you can catch unwanted rain and funnel it under you.

57. Consider hammock camping. Hammocks can be as light as about 2 pounds, and there are some great advantages like being able to set up on uneven ground.

58. If you have a tent with a fly, you may be able to set it up with the poles and fly only, especially in late summer when there are fewer mosquitoes.

59. You can more effectively use tent options without netting if you repel insects by adding permethrin to your tent.

60. Shake the water from your tent before packing it on a damp morning. Let the moisture drain off while the tent is on a rock or tree.

Clothing

61. Long-term weather reports from the internet can cut ounces from you pack. In dry weather you can leave some of the rain gear home. In warm weather you can leave some insulating layers home.

62. You can shave ounces by making some last-minute decisions about whether to carry things like rain pants. If the weather and conditions look good, you can leave items in the car.

63. If the weather is warm enough, some hikers like to leave the rain pants home anyway. Your legs will get wet, but they won't be trapped inside sweaty rain pants.

64. Your rain pants can be lighter than 4 ounces if you use "chaps" that cover your legs but are open at the midsection.

65. Rain gear can weigh less than 10 ounces for top and bottom if you use the very lightest and most simple varieties. We've already mentioned combination poncho/tarps if you want a piece of gear that serves as shelter and rain gear.

66. One of the best lightweight clothing rules is "no multiples." If you have one pair of pants, running shorts and/or rain gear are enough backup.

67. One very light short sleeve shirt and one long-sleeve shirt should be enough.

68. Avoid cotton. It doesn't dry as quickly, so it could be dangerous. And even if it's not dangerous, it'll be heavier when it's wet because the water weight won't dry as quickly as other fabrics.

69. Very light synthetic materials and silk may allow you to leave heavier, bulkier fleece at home. A couple of silk layers under your rain gear may be enough for summer hikes. That's a total of less than 6 ounces for 2 shirts.

70. Never wear jeans. They weigh about 1 ½ pounds and don't dry well. Lightweight nylon outdoor pants can weigh as little as 8 ounces.

71. If you need more insulation, there are ultralight jackets made with down that weigh less than 8 ounces, about the weight of a T-shirt.

72. You can save a lot of weight by using running shorts that weigh around 3 ounces instead of heavier cargo shorts.

73. Leather belts can be quite heavy. Look for a light belt. A lightweight nylon accessory strap with a quick-release buckle works well.

74. Using silk can cut the weight and bulk of your underwear in half.

75. A lightweight watch cap (beanie or lightweight stocking cap) can weigh as little as an ounce. It's great for extra warmth during the day or while you're sleeping.

76. A full-brimmed hat for storm protection that's made from silicone-coated nylon weighs as little as 1.2 ounces.

77. A baseball-type hat from lightweight ripstop nylon for sun protection can weigh less than an ounce.

78. A painter's cap will give you cheap, light protection from the sun. They weigh about 1.3 ounces.

79. If a hat is too hot for you, use a visor to be cooler and lighter. Visors vary a lot in weight, so use a digital scale to find the lightest one.

80. Lightweight polypropylene gloves that weigh an ounce will give you some warmth.

81. You can use your extra socks as gloves, or for added warmth over light gloves.

82. Those plastic newspaper or grocery bags that we used for keeping your feet warm at night can be used to keep your hands dry.

83. Socks that are warm, comfortable, and help you avoid blisters are vital. Don't try to go too thin and light if you tend to blister. But many popular styles come in various heights. So a shorter, lighter sock might give you the same function.

84. One of the best ways to save clothing weight is to use running shoes instead of hiking boots. The old saying of one pound on your feet being equal to five pounds in your pack is true. You lift your shoes with every step, so why not lift something light and comfortable?

85. Shoe laces that come with your running shoes are often too long. They catch on the little twigs along the trail. You might as well cut them off and save the weight. Burn the ends so they don't unravel.

Cooking

86. Keep your cooking gear light by using a kettle only. You can save more than half the weight of the cooking kit by leaving the plate and fry pan home. The ¾ quart kettle by itself weighs less than 5 ounces.

87. With titanium, your kettle can weigh under 4 ounces.

88. Stainless steel is heavy. Avoid it. Non-stick coatings make a kettle heavier than one without it. Decide whether the weight of the non-stick surface is worth it for you.

89. For your cup, use the plastic kind that have measuring marks inside. They're four times lighter than a sierra cup.

90. Try using a lexan spoon only. You probably don't need a fork. For cutting food you can use your pocket knife. File some of the excess weight from the handle of your spoon. Have some fun being a fanatic. Drill some holes in the handle.

91. Some hikers like a long Dairy Queen spoon because it can reach all the way into foil pouches and zip lock bags. Be ready to use some emergency chopsticks if the spoon breaks. Some people like chopsticks anyway.

92. Blacken the bottom of your kettle to cook faster and conserve fuel. If your kettle won't do this naturally, use heat-resistant paint, the kind you use to paint barbeques and wood stoves.

93. Keep the lid for your kettle. You'll save its weight by using less fuel.

94. Use a windscreen so you conserve and carry less fuel. You can probably use something that's already in your pack so there's no weight added. Or use something very light, like aluminum foil.

95. Use your digital scale to know the weight of a full and empty fuel canister if you use butane/propane. It's surprising how far a small can will go. You can learn when to leave a full 7-ounce canister home.

96. For a scouring pad, keep it simple and cut it down to a very small size. Or, better yet, don't take one at all. They tend to become bacteria magnets. Use goats beard -- the stuff that's attached to tree bark. Or use pine cones or sand.

97. You may need a towel to handle your hot kettle. Keep one small piece of a rayon camper's towel for kitchen use and one for your body.

98. The lighter, thinner towels you can find in grocery stores are even lighter than a rayon camper's towel. These work well on your body because they can rinse so easily for washing up.

99. There are two main types of ultralight stoves. Titanium stoves that burn butane/propane fuel can be as light as 2 ½ ounces. Their small fuel canisters are 7 ounces. Or you can choose a soda can style stove that burns denatured alcohol. These can be lighter than 2 ounces. Their fuel is readily available and can be carried in very light containers.

100. Fiberglass is often used as a wicking agent in the soda can stoves. The thin fiberglass within foil can be used to hold hot stoves or kettles and can be used to hold heat in your kettle.

101. The lightest water container is a plastic soda, water, or Gatorade bottle. Of course, you'll want to remove that heavy label.

102. Some backpackers like to stay hydrated by drinking directly from a tube as they hike. You can keep the weight of this system to a minimum by using only a bladder within your pack.

103. If you like to take salt and pepper, stock up on the kind that's in paper packets in fast food restaurants. Keep them in small zip lock bags.

104. Book matches are about as light as any. Store them in a small zip lock to keep them dry.

105. It's good to carry some windproof and waterproof matches, but the box they come in is heavy. Put some of the matches in a small zip lock bag and store the striker portion of the box in a small zip lock bag within so it doesn't accidentally strike.

Food

106. Freeze dried food is one way to reduce your food weight. But they are expensive and not always dense in nutritious calories. Freeze dried meals are often high in sodium, sugar, and fats. Read the labels. Learn what you like and what's nutritious.

107. There's a wide variety of weights among one and two-person freeze dried meals. Always check the weights to get the most nutrition for the least weight.

108. Eating vegetables is one of the biggest challenges on a long-distance hike. Learn which veggies you like in freeze dried form.

109. To reduce the weight and bulk of freeze dried meals, repackage them in lighter zip lock bags, and remember to keep the label and cooking instructions. Add a single piece of tape if you use a zip lock to avoid having zip locks pop open in your pack.

110. Some hikers cook in the foil bags that come with the freeze dried meal. If you do this, you can still repackage and use some of the foil bags more than once.

111. Experiment with trail mixes in your supermarket. Learn which ones you like and which ones are lightest.

112. Nuts are a part of what many hikers carry because they're nutritious and high in protein, but they are heavy, so consider eating them first.

113. Sunflower seeds are a dense, nutritious food.

114. Always eat your heaviest food first. Some of the most enjoyable foods aren't even considered backpacking food. But a nice steak cooked right on the coals of a fire is a fantastic treat the first night out.

115. Foods like packaged peanut butter and string cheese are nutritious and healthy, but heavy enough to be in that category of eating as soon as possible.

116. Dried apricots and some fruit leather aren't really that light. Know the weights, and if you still want to take them, eat them early in your hike. For instance, banana chips are far lighter than dried apricots.

117. Some backpackers like to use energy bars instead of traditional meals, partly because no cooking is involved. It's easy and you can hike more hours during the day. It pays to read the labels, because some energy bars are loaded with sugar which means empty calories.

118. A granola, oatmeal, or cereal breakfast can give you a quick start in the morning since you don't have to cook. You'll save fuel weight, too.

119. Dried soup mixes can be found in any supermarket, and it's an easy food to test at home. Experiment to find what you like and what's easy to fix.

120. Pretzels, crackers, tortillas, and healthy taco chips are good foods for the weight and you can munch on them without slowing down to cook.

121. Of course, a hike isn't a hike without beef jerky. It's high in flavor and protein and low in fat.

122. Tuna and chicken are becoming more available in small, foil pouches.

123. Consider buying a food dehydrator. You can experiment and find which foods are the lightest and taste best.

124. Powdered sports drinks can help you replace electrolytes. Find the ones that are lowest in sugar, since sugar gives you empty calories.

125. Remember to take your vitamin pill. It can't replace a meal, but it supplements your efforts.

126. Always carry some spare food in case of emergency, but make it some of your lightest food since it's not likely to be used.

127. Consider using a gallon size zip lock as your trash bag. Since some of your food containers will be thrown away when they're wet, leave the trash bag open as often as possible to let liquids evaporate.

128. Because water is one of your heaviest and most necessary items to carry, it's best if you know where it is so you don't have to carry so much. A reliable trail guide is far lighter than unnecessary water.

129. Having extra water in your car will help you carry and treat less water. Drink up just before you leave the car, and have enough to drink as soon as you get back to the car. It's simple, but many hikers don't do it. Keep the water in the trunk to stay cool.

130. For any of the water treatment methods, if the water is murky and heavy with particulate, you may want to pre-filter with a coffee filter or cloth. A coffee filter is extremely light.

131. There are lightweight methods for each of the six main ways to treat water. Boiling is slow and tedious, but this method doesn't take any extra weight for your cooking water. If you use a wood fire, boiling is the lightest method.

132. Bottles of iodine tablets weigh only 1.1 ounces full.

133. Iodine treatment can be as light as .3 oz. if you put your tablets in a 1-dram bottle. If you add a vitamin C to improve the taste, it will add only about .1 oz. more.

134. If you use chlorine dioxide (Aqua Mira) and use the small, one-ounce containers, the weight will be only 3.1 oz. when they're full.

135. If you use a filter, it can weigh less than an ounce if you use the McNett Emergency Frontier filter.

136. Bottle filters can weigh as little as 5 ounces including the bottle.

137. If you use a pump filter, remember to pump all the water out after each use so you're not carrying extra water weight.

138. The lightest of the ultraviolet light water-purifying devices weighs only 2.4 oz. and can be recharged and perform 20 treatments per charge.

139. You can use sodium hypochlorite (household bleach) in emergencies. Two to four drops of it will treat a quart of water. So, a very small and light supply of bleach could treat a lot of water. But websites that talk about this form of treatment always use the words "emergency use" and don't give details about overall effectiveness or the effects of long-term use on your body.

Body Care and First Aid

140. For insect protection, put only the amount of a good DEET-based repellent you need into a ¼ or ½ ounce container.

141. If you like spray applicators, the spray top from a Ben's DEET repellent bottle will fit the ¼ and ½ ounce Nalgene bottles. You can also find other spray tops that will fit the small Nalgene bottles in places like the sample section of your grocery store. Sample shampoo bottle spray tops often work.

142. Treat your clothing (and even your tent and pack) with Permethrin before you leave home. It's a weightless and effective way of keeping insects off all the areas of your body that are covered with clothing.

143. Keep your first aid kit in a zip lock bag. That's lighter than most original containers. Or, build your own kit with a goal of making it fit in a small zip lock bag.

144. A good starting point for a first aid kit is a tiny list of basic first aid procedures.

145. Your first aid kit should include light versions of bandages, gauze pads, alcohol pads, antiseptic pads, moleskin, butterfly bandages, and triple antibiotic ointment.

146. If you replace a needle with brass safety pins in your first aid kit, you won't have to worry about the needle poking you or your equipment. You can treat blisters with a (disinfected) safety pin. The brass ones last longer before they start to rust. A few tiny safety pins can be a part of your repair kit, too.

147. If you want cotton swabs in your first aid kit, remember the hollow-tube style are lighter than the solid ones.

148. A portion of a roll of surgical tape is a great, light way to be able to make large bandages if needed. It's also part of your repair kit.

149. A little wide athletic tape can be lighter than moleskin in preventing blisters. This tape can also be used for bandages and repairs.

150. Your aspirin and/or ibuprofen can be kept in small zip lock bags.

151. If you use antacids, they can be kept in small zip lock bags.

152. Anti-diarrhea tablets (loperamide hydrochloride) can be a life saver. A few with the packaging trimmed weigh almost nothing and can save a lot of inconvenience and the weight of lots of toilet paper.

153. A little Benadryl in a tiny container or in tablet form can give lightweight relief from insect bites.

154. Small zip lock bags should be considered for storing any small item. The small 2 x 3" zip locks weigh 3/100s of an ounce each, and the 3 x 5" bags weigh 9/100s of an ounce each. After you eat the food that you have stored in zip locks, the bags can be used for other things.

155. You can repackage your biodegradable soap in ¼ or ½ ounce containers.

156. Hand sanitizer is a good way to avoid stomach problems caused by dirty hands. You can carry a small amount in a ¼ or ½ ounce container.

157. If you can find a high SPF sunscreen that is a liquid instead of a gel, it's easier to use from a small container like the ¼ or ½ ounce bottles. With a liquid you won't have to dig with anything like you would with a gel to get the last bit from the container.

158. Look for good SPF lip protection in a smaller-than-average tube. You can find some that weigh .2 oz. instead of .4 oz.

159. Store your toilet paper in a zip lock bag so it stays dry. Take it off the roll so you never carry that "heavy" cardboard core. Use white, non-scented toilet paper so you don't attract animals.

160. For your toothbrush, look for one that has a small head. They vary a lot. Cut off part of the handle, and yes, drill a few holes in the handle. It's fun to be a fanatic.

161. If you want to use regular toothpaste, get the sample sizes. Use small amounts when you're hiking. It's easier on the environment and you'll carry less. For most short hikes you'll have plenty of toothpaste if you use the first half of the tube at home.

162. To pack a little lighter, use tooth powder. It's usually made up largely of baking soda. You may want to keep it in a very small plastic container. If you put it in a zip seal bag, the powder tends to get in the grooves of the closure and makes it difficult to work.

163. If you use dental floss regularly, measure it out and cut it for the number of days you need. The wax style stores well in small zip lock bags. Dental floss can be used for repairs, too.

164. If you take a comb, of course you'll want to cut it in half.

165. A mirror can be handy not only for grooming, but emergency signaling. The light, acrylic plastic mirrors weigh .8 ounces. They are 2 ¾" x 4 ¼". You can cut one with a utility knife and a file, so you have 2 mirrors. It will now fit in a 2 x 3" zip lock bag that will keep it from getting scratches.

166. Many hikers enjoy not using a deodorant for a few days. But if you'd like to pack some, you can find Arrid Extra Dry in many stores. Repackage only what you need in a tiny, plastic container.

167. Most medications can be kept in a small zip lock bag.

Miscellaneous

168. Your flashlight can be as light as ¼ ounce if you use one of the little “squeeze” lights. The kind with a positive on/off switch are much easier to use. Carry two and you’ll still be incredibly light in this area and have a backup and more hours of light.

169. Use lithium batteries to save weight. They cost more, but last longer.

170. If you use the little “squeeze” lights, trim the excess packaging from your extra batteries, but don’t take them out of the packaging and let them rub together. They’ll lose their charge and be worthless.

171. If you want a beefier flashlight, a model with 2 AAA batteries can be as light as 1.5 ounces.

172. If you like a headlamp, it can be as light as 1.1 ounces.

173. Trim your map to only the portion you need. Be sure to keep emergency exit routes and any other necessary information.

174. When using a guidebook for one of the long trails, take only the part that’s needed. If you’re hiking a major portion of the trail and mailing food drops, you can cut the book into the appropriate parts. Then you can throw away the old ones or mail them back home as you get to each new package.

175. Many hikes tend to be on very established trails. A compass is one of your essential items, but many hikers carry heavy compasses that are overkill. On some of the biggest trails like the PCT, CDT, and AT, the only question if you’re off trail is, “Do I want to head due east or due west to get back to the trail.” You can carry a compass that is as light as 1/10 oz. For 3/10 oz. you can have a compass that is marked every 5 degrees, is liquid filled, has a luminous dial, and a rotating bezel.

176. Some hikers love to carry their heavy “all-in-one” utility knife. For that weight you can carry a knife that weighs 3/10 oz. and 10 to 20 other pieces of gear.

177. Have a separate pair of sunglasses for backpacking, a pair that weighs less than an ounce. Chances are a small, frameless pair will be quite a bit lighter than your regular sunglasses. The lightest storage protection is probably a zip lock bag.

178. There are a lot of things you can use for fire starter. Your cooking gear might be enough. Dryer lint is an old favorite that is very light.

179. You may never need an emergency blanket, but it's cheap insurance for only 1.8 oz. and it can serve other purposes such as a ground cover or a dry place to sit.

180. Your emergency whistle can be as light as .2 oz. for a small plastic version or .1 oz. for the light aluminum style.

181. Choose a utility cord that is thin, but strong. You can have strong cord that weighs only .4 oz. for 25 feet.

182. A few rubber bands make a nice utility item and add very little weight.

183. If your regular watch is very heavy, get a cheap plastic one for backpacking. Many hikers like a light and an alarm and don't need much else. If you get one with only those features it will be inexpensive and light.

184. Some hikers won't leave home without duct tape. It works for a number of repairs and can be used for first aid. If you tape some to the outside of your pack, be sure it's not melting into a ball in the sun. Some brands do better in heat. You can find duct tape in "flat packs" of 3 or 5 yards.

185. There are hikers who must have a trowel for bathroom use, but you can save weight without one. The wilderness provides its own trowels. They're called sticks.

186. A pencil and pen are important items to have. You may need them to leave important messages on the trail. You can place a message in a used zip lock bag on the trail and it will be protected from rain. Find a very small pen or even a thick plastic pen refill that works as your pen.

187. You'll need to carry your car keys, so have a separate one made that can be drilled out and filed to lighten.

188. Your car key would be a terrible thing to lose, so add some bright Mylar from a party balloon or a piece of bright cord or yarn.

189. If hiking poles appeal to you, check around until you find the lightest. You may not want all the features that add weight. A pair should be under one pound. Specialty companies are bringing this weight down even further.

190. Umbrellas work in sun and rain. They can be as light as 5.5 ounces.

191. If you're doing an "in and out" hike, you might be able to save purification time by caching (hiding, storing) some water part way into the hike. Be sure you can find it on the way out.

192. If you're hiking one of the long trails, become an expert at what to send to re-supply points. Keep a supply of what you may need with your support person at home so you can call or send a note and have it sent to your next supply point. Carry postage, or include it in your food drops in case some of your supply points don't sell postage. If you have postage, you can send unwanted gear home.

193. Some people like to take a lightweight paperback for reading. One way to lighten your reading material is to burn it as you read it.

194. If you need reading glasses, get a separate pair for backpacking. You'll find that the very thin ones, the kind you buy in a tube case, are very light. These are often sold in airport gift shops.

195. If you have trouble with foggy glasses, you may not need to carry a special anti-fogging liquid. Try the old skier's trick that is used on ski goggles – spit on them.

196. When you stop to rest and want a clean, dry surface, try using a Tyvek envelope or a small piece of closed-cell foam.

197. You don't want to leave your wallet in your car, so plan ahead and take only the cash you need, your ID, a credit card or two, and possibly a phone card.

198. Leave your jewelry at home. It's probably not that heavy, but you wouldn't want to lose it out there.

199. Find the lightweight camera that works best for you. Some of the disposable models are very light. If you're more serious about your photography, lighter models with more quality are available. Take your digital scale when shopping.

200. Leave extra clothing in your car. When you return, if you're especially wet or dirty, it'll feel great.

201. Leave your cell phone in your car. You don't need it hiking and probably won't have coverage in many areas. If it's in your car, you can call home for messages as soon as your hike is over.

There you have it, 201 ultralight backpacking tips. Hike light. Have fun.

Bonus tips!!

1. Get a haircut!

2. Trim your nails!

Chapter 3: How I Started Hiking Lighter and How Only The Lightest Camping Equipment & Hikelight Started

I suppose my conversion to lightweight backpacking started one sunny Saturday in 1960. My Boy Scout troop went on a day hike near my hometown of Cottage Grove, Oregon.

It wasn't a very hot day, and my backpack wasn't very heavy. But those old canvas backpacks didn't fit very well and they were hot against your back. I noticed that George, one of the other scouts, carried only a small brown sack with his lunch. After lunch, he smashed his soda can flat, folded the paper sack, and put them both in his back pocket. So during the warm afternoon, he didn't carry a thing! George was as free as the breeze while I carried my uncomfortable and unnecessary pack. I questioned every little silly item I'd carried in my pack just to "be prepared." The only thing I really needed was the lunch.

So, from that point on as a scout I carried what I needed and nothing more. It didn't take a great deal of planning, and every outing was more fun.

About 12 years later, I was a very untrained scoutmaster. I could have avoided going on a 50-mile hike with the scouts, but I wanted to go, and I wanted them to have the experience. We lived near the Three Sisters Wilderness area, a gorgeous place for a 50-mile hike. As raw and untrained as I was as a leader, I knew one thing for sure – I didn't want to be a baby sitter for some boys who were ill equipped and struggling to carry their packs.

By having training sessions and meetings with parents, we were well prepared for our adventure. The trip was a total success and it increased my love for backpacking.

From that time on, I tried to spend a few days each year in the high Cascades. During good years, I was able to get away for a few days and add to my miles on the Pacific Crest Trail. Gear wasn't as fancy then, but you could still pack light. My wife helped me sew some extra pockets on a fanny pack and we made a foam sleeping bag. One of those old adventures was a weekend hike in the Mt. Hood Wilderness where I carried 13 pounds. Some things worked better than others, but it was fun trying to lighten up.

My kids went with me as soon as they were potty trained. I loved the simplicity of grabbing a pack instead of loading a car with tons of items for some “car camping.”

My summer interest in backpacking lead to my winter hobby of figuring ways to lighten my backpack. I enjoyed looking through all the backpacking equipment catalogs, but was frustrated at how much “heavy stuff” I had to wade through to find a gem of lightweight backpacking gear. I started thinking of putting together a catalog of all ultralight hiking gear.

I figured I could offer everything except food and footwear. By looking through the catalog, backpackers could get an idea of how to reduce the weight of every piece of gear in their packs. Hikers could treat my catalog like a buffet and choose what they liked.

A few of the items in the catalog/website today are much the same as they were in 1993. The silk shirts, nylon shorts, belt, one of the Gerber knives, mess kit, towel, lexan utensils, plastic cup, water purification tablets, Timberline filter, Campsuds, small containers, emergency blankets, whistle, small zip-seal bags, windproof/waterproof matches, and first aid kit have stood the test of time with little or no change. Other lightweight backpacking gear has had small changes and totally new items have been added to the choices.

One thing has remained the same since 1993. We’re still small, by choice. If I’m out hiking or just out of the office, you may not get instant service. I need to hike, too. But most times you’ll get fast service. And you can still talk to the owner. I understand lightweight hiking and what you’re trying to accomplish.

It’s fun to hike light, and it’s rewarding to help other hikers reduce the weight of their backpacks and have more fun.

Chapter 4: Hiking light -- After You Lighten up the Big 3, Tackle the Next Three -- Sleeping Pad, Rainwear, and Cooking Gear

When you decide to reduce the weight of everything in your pack, ultralight hikers will tell you to concentrate on the “big three,” your backpack, tent, and sleeping bag because that’s where you can trim the most weight. Exchanging that seven-pound backpack for one that’s under two pounds is a great start. And a sleeping bag and tent that are both under two pounds is fantastic. The weight of your big three is now under five pounds!

You make that switch to a smaller pack with faith and determination, but there’s an uneasy feeling that everything won’t fit in the new, slimmer pack. How do you get it all in? How do you get the overall weight as low as possible?

If you can ruthlessly cut the weight of everything in your backpack in half, basic math tells you your pack can go from 40 pounds to 20. You might say you can’t cut everything in half, but some items can be cut by more than half. So, your overall goal of cutting your weight in half is reasonable. It may seem tedious, but remember, do a good job of this just once, and the rewards will last forever. Your pack will be waiting there in your closet, light as a feather, waiting for your next hike.

Consider the items you carry, one at a time. After your pack, bag, and tent some of the biggest items to consider are what you might call “the next 3,” your sleeping pad, rainwear, and cooking gear. Sleeping pads can be a challenging piece of gear to choose. You need to sleep well or the whole hiking experience will be negative. A good, closed-cell foam pad insulates well and is one of the lightest solutions. A full-size version can be in the 10 ounce range. The downside is the volume, but it can be carried on the outside of your pack. If you need more comfort and not too much insulation, there’s nothing like an air mattress. Even the self-inflating pads have less than half the thickness of air mattresses. The weight for a full length air mattress can be as light as 19 ounces and you get 2 ½” of loft. If you’d like thickness and insulation, there are air mattresses with insulation in the tubes. You still get 2 1/2” of padding, synthetic insulation, the self inflating feature, a compact package that’s about a 5” diameter cylinder by 10”, and it weighs only 22 ounces.

Like most backpacking gear, your rainwear is a “tradeoff” item. You can have some of the features, but not all of them in one package. The good news is there are many choices. In warm weather where hypothermia isn’t a problem, some people like to have a rain jacket and hike in shorts letting their legs get wet. Another choice is a poncho or cape. Some of these even serve as a shelter. Poncho/tarps and capes can be in the 7 to 11 ounce range.

Your rain pants can weigh less than four ounces when you use chaps that cover your legs but are open to release the moisture your body creates at the midsection. Rainwear that’s not as strong as nylon and doesn’t compact as well can weigh less than 10 ounces for a jacket and pants. Breathable nylon-based rain jackets and pants can be less than 20 ounces. Your summer rainwear doesn’t need insulation like a coat. If you need some insulation under the rain gear to keep warm, use light layers that can multitask in other conditions. Your new, lighter raingear will pack smaller, too.

Let’s talk about kitchen items. Most backpackers can significantly cut the weight and bulk of their cooking gear. By carrying a kettle instead of a full mess kit with frying pan and plate you slash over half the weight. The ¾ quart kettle by itself weighs less than five ounces. If you want to go even lighter, you can get a titanium kettle. And if you’re carrying that age old favorite, the sierra cup – why? It weighs over four ounces! Throw it as far as you can and take only the plastic cup that comes with most mess kits. It’s less than an ounce. While you’re throwing, toss that metal spoon, fork, and knife combo. In fact, why not ditch the fork and carry only a lexan spoon. Take a file and cut it down a little and it will not only be a little lighter, it will fit inside your kettle. You probably don’t need the fork and for cutting you can use your pocket knife.

There are many choices in lightweight backpacking stoves. Some of the lightest stoves are titanium butane/propane burning models that are as light as 2 ½ ounces. The fuel canisters are only seven ounces. Another lightweight stove choice is the homemade alcohol stoves made from soda cans. These weigh less than two ounces. The denatured alcohol that they use is readily available and can be carried in very light containers. If you like to include a towel as part of your kitchen, you can take a small piece of the rayon “campers” towels that are highly absorbent and dry quickly. A small piece of scouring pad can be included. Everything will fit inside your kettle that also holds your new, lighter stove, matches, and trimmed-down lexan spoon.

For carrying water, the lightest way is plastic soda or water bottles. If you can use potable aqua tablets to treat your water, you can save the weight of your filter. Check out all the options for water purification, and choose the one that fits your needs and the area in which you'll be hiking. Be open to trying lighter choices.

Enjoy your lighter sleeping pad, rainwear, and kitchen gear. And notice how well they fit in a smaller, lighter backpack.

Chapter 5: Hiking light -- Sweat the Small Stuff and Reduce the Weight of Everything in Your Backpack

All your life people have said “Don’t sweat the small stuff.” That’s usually good advice. But in lightweight backpacking it’s a great idea to “sweat the small stuff.”

You can trim the most weight from the larger items you carry such as your tent, sleeping bag, and the backpack itself. Then you move on to the sleeping pad, rainwear, and cooking gear. But don’t stop there. All the remaining little items add up, too. If you ruthlessly trim them, you can carry significantly less weight. You’ll enjoy the freedom, and you can maintain comfort. In some ways you’ll have more comfort, not just from weight savings, but because of the smaller size and simplicity of the gear.

Remember that every lightweight technique is an option. Pick and choose what works for you. Every backpacker is different. Do it your way.

Have you ever been ready to leave for a backpacking trip and grabbed something at the last minute? Maybe you packed a flashlight or extra shirt that weighed 6 ounces. That seems pretty light. It surely wasn’t going to ruin your hike. Not by itself anyway. But in lightweight backpacking the thing to remember is that every single item adds up.

In my backpack I carry a sandwich size ziplock bag that weighs less than 6 ounces – and it holds 27 items. That’s 27 pieces of gear that weigh the same as many hiker’s flashlight. Read through the list and see how you can trim weight and enjoy a lighter, simpler backpack.

Item	Weight	Notes
Compass	0.1 oz	It's the tiny insert portion of a keychain compass
Whistle	0.1 oz	Tiny cylinder-shaped aluminum style
Mirror	0.2 oz	For signaling & grooming. acrylic, trimmed small
Comb	0.1 oz	Cut in half of course!
Book Matches	0.3 oz	2 full regular books
Safety Matches	0.3 oz	Some wind & waterproof in a 2x3" ziplock bag
Soap, Biodegradable	0.3 oz	For body & dishes, small amount in 1/4 oz. container
Sunscreen	0.3 oz	Liquid style, small amount in 1/4 oz. container
Pen	0.1 oz	Thick style refill will work
Paper	0.2 oz	A few "sheets" in 3x5" ziplock--fire starter too!
5 Rubber Bands	0.2 oz	Extras for repair, wraps air mattress, etc...
Toothbrush	0.1 oz	Trim handle, then drill holes for fun!
Tooth Powder	0.1 oz	Lighter than toothpaste...
Floss	0.1 oz	In a 3x5" ziplock, great for repairs too
SPF Lip Balm	0.2 oz	Look for a thinner, lighter brand than usual
Benadryl Cream	0.4 oz	Added to first aid kit, relieves bug bites a little
20 Ibuprofen	0.2 oz	Backpacker pain reliever of choice in 2x3" ziplock

Item	Weight	Notes
12 Aspirin	0.1 oz	Extras for altitude headaches in 2x3” ziplock
8 Loperamide	0.1 oz	For diarrhea, trimmed and put in 2x3” ziplock
6, 1” Brass Safety Pins	0.1 oz	For equipment repairs and treating blisters
30 Potable Aqua Tabs	0.3 oz	In amber 1-dram bottle, 1.1 oz if in original bottle
Light Nylon Cord	0.2 oz	For repair or general use, 25 ft. in 3x5” ziplock
Gerber Micro Knife	0.4 oz	Very light, high quality
2 Princeton Pulsar IIs	0.4 oz	Enough light for camp use, includes a backup
Extra Set of Batteries	0.2 oz	Extra set for both. Insures many hours of light
Favorite scriptures	0.1 oz	40 years in wilderness, must pack light!

There it is. That's 27 items of gear that weigh less than 6 ounces! You can do it and enjoy the freedom, too.

You can reduce the weight of other small pieces of gear, too. For garbage the large re-sealable 10 ½" x 12" bags found in supermarkets work great and they weigh only 4/10s of an ounce. If you need sunglasses, start looking for the lightest, frameless quality pair you can find and then make them the ones you always leave in your backpack. For your map, take only what you need, but don't trim the legends or emergency "escape routes."

Some car keys can be hollowed out. I drilled almost half the weight out of mine. I attached some bright mylar (from balloons) so the key can be spotted easily if dropped. Take some cash, at least one credit card, and your driver's license, but leave your wallet and most of its contents home. It's dead weight.

Don't skimp too much on toilet paper, but do place it in a ziplock bag. And be sure to use white, non-scented. A super light emergency blanket can give you protection for only 1.8 ounces. Your first aid kit can be quite complete and very light. You can start with a "mini kit" and throw away the plastic pouch it comes in. Place the contents in a ziplock bag and with the weight savings from tossing the original container you can actually add more emergency items or things you use most. Those can include items such as butterfly bandages, a roll of light surgical tape, extra packages of triple antibiotic ointment, or extra moleskin. You can pack a lot of first aid in two ounces.

Most people want some kind of pillow, but experiment with light ones. Your clothing in a stuff bag might work. Part of your pack might work. I use a small piece of foam that weighs 7/10s of an ounce and add clothing underneath for more loft.

Some hikers won't leave home without a camera. There are lots of lightweight options for cameras. There are backpackers who consider deodorant a must. Arrid makes a cream that can be placed in a small, plastic container. If you need reading glasses, look at the very narrow kind. They're probably half the weight of your regular pair. For your medications, use small ziplock bags if your meds don't need to be in super, airtight containers.

When you "sweat the small stuff," you not only save weight, you simplify your hiking techniques and save bulk in your backpack. Cutting the weight of the little things is one more way to help you float down the trail.

Chapter 6: Hiking light – Pack Lighter by Reducing the Weight of Your Backpack

Ultralight backpacking is becoming more popular because it's more fun. The feeling of freedom is exhilarating. Choosing the right lightweight backpack is a great way to lighten your load.

Many backpacks weigh around seven pounds. They hold everything you might want -- and that can be a big problem. If you buy a big pack, you're likely to fill it. A smaller pack will make you become more disciplined in your packing.

Choosing a two-pound pack, or less, is a logical choice. Trimming your backpack from seven pounds to two is a huge weight savings. But when you reduce the volume and carrying capacity of the pack, you have to commit to a total system that's compact as well as light. Here's a little quick and simple math to give you plenty of incentive. In that new two-pound pack you're going to place a 1 ½ pound sleeping bag, a two-pound tent, a one-pound sleeping pad, a ½ pound cook kit with stove, and rain gear that weighs one pound. That's a total of eight pounds. You've packed all your heaviest items and you're carrying only one pound more than your old pack weighed when it was empty!

Most ultralight packs have extension collars for carrying extra gear, or loading in supplies of food at the beginning of trips or at re-supply points. If there's not an extension collar, you can tuck an ultra-light stuff sack under the lid or under the compression straps. You can always find some gear that won't be harmed by moisture if it's strapped to the outside of the pack.

If you needed a new pack anyway, you'll save by buying a smaller pack. The price tags of big packs can be huge, too.

The manufacturers of big backpacks have the nerve to give them names that sound positive, like "load monsters." Big packs brag that their packs can comfortably carry heavy loads. There is no way to comfortably carry a heavy load. Your legs will judge comfort more on total weight than fancy, heavy padding.

If you really love external frame packs, you can still find some that are truly lightweight packs. But most ultralight packs are internal frame models. If you switch from an external frame pack, about the only negative you'll notice is the heat and moisture against your back if you tend to perspire a lot. That's not a bad tradeoff. You have immediate advantages other than weight savings over your frame pack. You'll be better balanced. You'll be able to bring the pack inside your tent more easily. And with a lighter load, you can cool your back and rotate using different muscle groups by hanging the pack on one shoulder at a time.

Packs are an item on which individual backpackers have a wide variety of needs and preferences. Since backpackers come in all shapes and sizes, getting the right fit is important. Some people want to have most of the pack weight on their hips. Others pack light enough that they want to save the entire weight of the hip belt by leaving it off. Try hiking without your hip belt. You might find it is much less restricting. Differences in shoulder shape and torso length make a difference in what pack you'll like. Some backpackers need lots of adjustment points. Others aren't as particular. Some people like sternum straps and some don't need them. One thing ultralight backpackers agree on is that with a reasonable amount of care, backpacks can be made with very light materials.

Decide which features you need. But be open to change and leaving some of the bells and whistles behind. You'll find the freedom of a simple, light pack is a great feature in itself.

Many ultralight packs use your sleeping pad as a frame. Z-rest pads work well, and there are many other options. Hydration ports are popular and are available on many lightweight backpacks. Most hikers want water bottle pockets on the outside of the pack. Many people want at least one outside pocket to keep things like snacks and maps handy. Most packs have plenty of attachment points for holding extra gear. Always look at the compression system to make sure the pack will carry well when it's holding small loads.

Check to see if the pack uses waterproof material. If you does, you can save the two or three ounces a pack cover would weigh.

After you use your new pack for a while, you may be able to cut off some of the length of the straps and save a little weight. Just be sure to leave enough room for those times you're wearing your full rain gear and any bulkier items.

There are packs that weigh from one to two pounds. For the lightest backpackers, you can even have a pack that's less than a pound.

When you choose the best ultralight backpack for your needs, you'll enjoy weight savings and comfort all day long.

Chapter 7: Hiking light – Pack Lighter by Reducing the Weight of Your Sleeping Bag

It's easy to understand the advantages of ultralight backpacking. With less on your back you'll have more fun. You feel more free and closer to nature. Choosing a lightweight sleeping bag is one of the great ways to start lightening your backpack..

A warm, good night's rest is crucial when you're backpacking. You don't want to sacrifice comfort at night for minimal weight savings during the day. If you make the right purchase you can rest better than ever and still trim the weight and bulk of your sleeping bag.

Most backpackers can reduce the weight of their sleeping bag by a couple of pounds because their current bag is overkill. Hikers buy heavier bags just in case they go on winter trips. Since most of their hikes are in the summer, or part way into the spring and fall, they end up sweating in their bags and unzip them as far as possible. Sometimes the bag is so hot it ends up being nothing more than another pad with a warm backpacker on top.

It's more logical to buy a light bag and add something like a silk liner to extend the bag when necessary. Some people like to use a liner because it's much easier to clean than the bag. If you plan to use the bag in winter, it can still be doubled with another bag.

High fill power goose down is the best insulation material available. It provides more warmth per ounce than any other material. Down-filled sleeping bags are as much as 35% lighter than synthetic bags. Down sleeping bags are much more compressible, so they take up less room in your pack. Down is also known for its longevity and lasts at least three times longer than synthetics. I know of bags from the 1970s that are still going strong. Factor in the lifespan of a down bag when you make your initial investment.

The fear of a wet bag is the most common concern people give for avoiding down bags. But any bag is uncomfortable when wet. It's actually fairly difficult to get a down sleeping bag soaked. You'd have to go through a sequence of events (mostly avoidable) to get your bag drenched once it is fully lofted. It's hard to get down wet because it has natural oils in it. Geese are waterfowl and they've been perfecting their down for millions of years.

Have the proper equipment to keep your bag dry and increase your skills in camp placement. Always keep your bag in a waterproof stuff sack or pack. Know how to reduce condensation in your tent. Keep a towel handy to wipe tent walls. If you camp under a tarp, you may need a super light bivy to protect your bag. Choose a campsite that can't become a mini stream running under you if it rains.

High quality down bags are most often made with shell fabrics that have a very tight weave. Durable water repellent finishes are added. As time wears the durable water repellent finishes thin, a new coating can easily be applied. The combination of tight weaves and water repellent finishes is enough to repel normal dew and condensation. Quality shell fabrics are also highly breathable.

The fill power number of the down will give you an idea of the quality of the down. The best down lofts higher per ounce and gives more warmth.

A roomier bag will take longer to heat up and will have more heat loss when air moves in and out of the bag with your movement. Narrower bags are the lightest and most temperature efficient if you don't mind a snug fit.

Some people need full-length zippers so they can open the bag all the way on warm nights. The lightest bags sometimes have no zippers or partial zippers to reduce weight and increase efficiency. Consider whether you want a left or right zipper. Most hikers want left zip bags because as you're lying on your back it's easier to reach across your body to your left side to use the zipper.

For a lightweight summer bag you probably don't need every feature, such as draft tubes down the side or draft collars at the top. More features equal more weight. Buy only what you need to reduce the cost as well as the weight.

Temperature ratings are an estimate and vary from person to person. Use them as a starting point. Your metabolism is responsible for how comfortable you will be at a given temperature in your bag. Your comfort level can change from day to day not only from outside temperature changes, but from your own energy level, food intake, and whether you're well hydrated. Ask others and check hiking forums to discover which brands give the most realistic temperature ratings.

When you purchase the right ultralight sleeping bag, you'll enjoy the weight savings every day and the comfort every night.

Chapter 8: Hiking light – Pack Lighter by Reducing the Weight of Your Shelter

Ultralight backpacking is becoming more and more popular. With less weight on your back you have more fun. You feel free, unburdened, and close to nature. Choosing a lightweight shelter is a great way to lighten your backpack.

There have been some good lightweight shelter options for many years, especially if you backpack with a partner. You could split the weight of the tent by letting one person carry the fly and poles while the other carried the tent body. But the options have increased in recent years and a two-person tent that weighs four pounds isn't even considered ultralight.

Many tent manufacturers are still producing tents that are overkill for lightweight backpackers. Tent makers don't want to ever see their tents returned for any reason, so it's easier for them to use heavier, cheaper materials. With normal, common sense care of your tent, you can be using an ultralight shelter that lasts for many years. Tents are one area of lightweight backpacking where the specialty tent makers are far outperforming the mainstream manufacturers.

With the introduction of ultralight silicone-impregnated nylon, two-person tents are now in the two to three pound range. One-person tents are less than two pounds. Fabrics aren't the only thing that's gotten lighter. Poles went from aluminum to ultralight carbon fiber. A 45" tent pole can now weigh less than two ounces. Many new tents are designed to use a hiking pole as the tent pole. So if you're already using hiking poles, your tent pole weight is zero. Stakes have gone from aluminum to titanium. A 6" titanium stake is just .2 ounces.

For the really ultralight, and those who aren't expecting many mosquitoes or much rain, a simple tarp can weigh around one pound. It's enough to keep the dew from settling on you, and it's a great way to feel closer to nature. Some tarps are even designed to do double duty as your rain gear. It's always great to save the total weight of a piece of gear. If you like sleeping under a tarp, but want some extra rain protection, a lightweight bivy or sleeping bag cover can be as light as six to seven ounces. A ground cloth underneath you can be in the three ounce range. Ground cloths can be made from silicone-impregnated nylon or Tyvek.

If you need more mosquito protection than a coating of your favorite repellent gives you, you can wear a mosquito head net that weighs just .6 ounces. If the head net is too confining, a square yard of no-see-um netting is only about an ounce, and you can configure it in a number of ways to stay away from your face.

In dry climates where you're only concerned with insects, you can use a bug bivy that's in the four to seven ounce range.

Most really light tents aren't freestanding like your old dome tent. But they are easy to set up. The really light tents don't have a separate fly, so that's one less thing to set up. Instead the tents rely on well-designed ventilation on all sides.

If you sometimes hike solo, consider the advantages of having a separate ultralight one-person shelter for those times you go alone. When you aren't sharing the weight with anyone, you want your tent to be as light as possible. If you want one tent to cover all bases, the lightest of the two-person shelters provides a way to pack lighter whether you're going alone or with a partner.

Look closely at all the new options for ultralight shelters. See which ones have the features to fit your needs. Check forums and gear reviews. Ask other backpackers, and remember not to give too much credibility to those who pack heavier than you. And give extra credit to those who are packing lighter than you.

One of the great benefits of a lighter shelter is the reduced volume that comes with it. This allows you to use a smaller, lighter backpack.

When you purchase the right ultralight shelter, you'll enjoy comfortable nights and a lighter backpack all day long.

Chapter 9: Hiking light – Pack Lighter by Reducing the Weight of Your Backpacking Clothing

Have you ever packed what you thought was a light backpack, then added your clothing only to discover you had a heavy, totally-stuffed, backpack?

By reducing the weight of your clothing you can lighten your load and reduce the volume in your backpack.

Since you lift your shoes with every step, wearing running shoes can save more energy than any other lightweight clothing choice. Lifting boots with every step results in lifting literally tons of weight on a long hike. You wear running shoes for every day use because they're more comfortable. Those same shoes are more comfortable on a hike, too. They dry out quickly if they get wet. They make you more agile. And most importantly, you feel less fatigue at the end of the day.

Your rainwear is usually your heaviest clothing item, so it's often a place you can trim some weight. If your rain gear weighs over 20 ounces, it's time to lighten up. There are many choices for rainwear. In warm weather some hikers like to use a rain jacket and hike in shorts letting their legs get wet. Another choice is a poncho or cape. Some of these even serve as a shelter. Poncho/tarps and capes can be in the 7 to 11 ounce range.

Your rain pants can weigh less than four ounces when you use chaps that cover your legs but are open to release the moisture your body creates at the midsection. Rainwear that's not as strong as nylon and doesn't compact as well can weigh less than 10 ounces for a jacket and pants. Breathable nylon-based rain jackets and pants can be less than 20 ounces. Your summer rainwear doesn't need insulation like a coat. If you need some insulation under the rain gear to keep warm, use light layers that can multitask in other conditions. Your new, lighter raingear will pack smaller, too.

Part of reducing your clothing for lightweight backpacking is just planning for what you really need and leaving the rest at home. Some fanatics take only what's on their back, and their spare clothing is their rain gear. After all, getting grubby and sweaty is part of the experience. If that's too extreme for you, at least it gives you a starting point from which you can plan backwards. Do you really need a second pair of pants when you have rain pants and a pair of shorts?

A short-sleeve and long-sleeve shirt gives you layering options and a backup. Silk or synthetic are lighter than cotton and more functional because they dry more quickly. Silk shirts can be as light as 2 ½ ounces for a T-shirt or 3 ounces for a long-sleeve shirt. They work well on cold or hot days, and dry quickly. Some synthetic shirts are only slightly heavier than silk. A digital scale can be helpful when purchasing backpacking clothing because it's difficult to estimate clothing weights.

Supplex nylon shirts and pants are strong, light, and dry quickly. A pair of nylon pants can be around 8 ounces, about 1/3 of what your cargo pants weigh. You might not think twice about what belt you take, but a lightweight nylon belt weighs about 1/3 of what you'd be carrying with a normal canvas or leather belt. If you toss your full length shorts into your backpack, you're adding about one pound. You could cut that weight drastically by taking a 3 ounce pair of nylon running shorts.

If your hikes extend into cool seasons, or you're hiking at high altitudes, you can layer down vests, jackets and pants under your rain gear. Jackets and pants can be as light as about eight ounces each. Vests weigh less than six ounces. Synthetic jackets can be as light as about nine ounces and pants can be around ten ounces. You don't need to add heavy, bulky parkas.

You can save weight on socks, but know your limitations. If you tend to blister, choose extra padding over super lightweight socks. After all, lightweight backpacking is all about the extra comfort of a lighter backpack. Blisters from thin socks could ruin your comfort level. There are a number of comfortable choices that are about 2 ½ ounces per pair. Look for socks that cushion well and dry quickly.

You probably wouldn't think twice about throwing your baseball cap into your pack. But with a little planning you can find a lighter one that repels rain better or is cooler when it's hot.

It's nice to have gloves when it gets cool and you don't need to add much weight to be comfortable. A pair of polypropylene gloves weighs only about an ounce.

When the mosquitoes are biting, a mosquito head net is a great piece of "clothing" to have at only 6/10s of an ounce.

You can even save clothing weight by using silk or light synthetic underwear.

Take a close look at every piece of clothing you pack, just like you consider other pieces of gear. Your clothing is a great place to lighten up.

Chapter 10: Going hiking? Throw Your Boots Away!

Really! Well at least leave them home. Since you lift your feet with every step, wearing lightweight running shoes can save more energy than reducing the weight of any piece of gear in your pack.

Grab those lightweight running shoes. You know. The ones you wear every day because they're so comfortable. Wouldn't you like to be comfortable when you're hiking, too? I'll bet you've never said, "I think I'll go out in the woods today just to be miserable." Let's do some quick math. The average running shoes weigh around 1 ¾ pounds and the average hiking boots weigh about 3 ¾ pounds. That means you're lifting an extra pound with every step. Since there are about 2000 steps in a mile, you're lifting an extra ton every mile. Things that lift a ton are supposed to be called heavy duty cranes.

That old saying of one pound on your feet being equal to five pounds in your pack is more than true.

Don't fall into the trap of thinking you need a pair of boots because you're hiking. Let's consider some of the concerns that make hikers think they need boots. You don't want to get an ankle sprain. Lighter shoes and loads reduce your chances of severe ankle sprains. You're more balanced and not apt to trip on rocks and roots.

Backpackers think they need to keep their feet dry. It does help to keep the blisters away. When heavy, leather boots get wet they stay wet. When you wear your running shoes and rain and dripping dew from trailside plants get your shoes wet, they quickly dry out. For stream crossings, you can take your socks off before crossing if you like. If it's getting into cold seasons I still prefer athletic trail shoes that are waterproof and light. The ones I occasionally use are 2 pounds 9.4 ounces (size 10).

Hikers worry that running shoes won't give them enough cushioning under their feet. Quality running shoes need to cushion the feet. When you buy your running shoes, check the insole (the inside of the shoe) and the outsole (the part that contacts the ground). If the sole is soft, it can absorb shock better. You don't want to be poked by every rock, but you don't want the hardest sole you can find either. You may not have paid much attention to the arch support in your running shoes, especially if your shoes are more for everyday wear than actual running. For hiking, you will want to make sure the arch support is right for you. Order a catalog from one of the companies that specialize in athletic shoes. You'll notice that these catalogs describe the height of the arch support in their shoes.

Some hikers like to remove the insole and add one that has more cushioning. Be careful when doing this because your foot will tend to swell when hiking and a thicker insole can make the shoe too tight and cause blisters.

If you have foot discomfort when you hike, consider being fitted for orthotics. I had pain in one foot while playing racquetball and orthotics made the condition much better. I've talked to backpackers who swear by their orthotics.

After you've experienced the freedom of lighter hiking shoes you probably won't want to wear your old hiking boots even on the toughest of terrain. The increased agility of running shoes is more noticeable on rough terrain.

Backpackers might think they need boots to keep debris out of their shoes. You can add a pair of 3-ounce gaiters and still be much lighter and more comfortable in running shoes.

Shoes that aren't labeled running shoes can be effective, too. You might like your cross trainers, but be wary of flat shoes that are primarily court shoes. You'll feel less cushioning on rough terrain and you'll slip on wet surfaces. Shoes that are labeled "trail runners" are usually very good because they're basically a running shoe that's built for tough conditions. My trail runners weigh only two ounces more than my running shoes.

When you purchase your shoes remember that fit is everything. Be careful not to try them on early in the morning. Your feet tend to swell a little during the day. Try both shoes on since most people have one foot that's a little larger than the other. Of course, always walk in the shoe. It may feel far different than when you're sitting down.

Make sure there's plenty of wiggle room in the toe box. Wear your thick hiking socks because that will change the fit a little. Make sure the shoes fit you in such a way that your heel can't slide up and down and your toes can't rub against the top of the shoes causing blisters. Don't rely on a "break-in" period. If the shoe doesn't feel good right away, try others. There are plenty of choices.

Be sure to buy shoes that are big enough, especially if you're planning a thru hike. Backpackers who hike the long trails often talk of ending their trip with a bigger shoe size than when they started. If you're going to hike one of the long trails, consider leaving your support person with the style and store where you'd like to buy your shoes if you need replacements. But wait until you're hiking before giving your support person the size and re-supply point at which you'd like the replacement shoes.

Go ahead and take that digital scale with you when you're shopping for running shoes. Actual shoe weight can differ greatly from the stated weight.

Some hikers have a separate pair of sandals for camp. When you hike in lightweight running shoes, you'll most likely decide you don't need the camp sandals anymore. There are some sandals that are built for hiking, and some backpackers like the feeling of freedom sandals give. There are obvious disadvantages like abrasions from rocks. Experiment on shorter hikes if sandals are appealing to you.

Another great advantage of lighter hiking shoes is the reduced impact on the environment. Every step is truly lighter and easier on nature.

With light shoes and a light pack you'll feel like you're floating down the trail.

Chapter 11: Hiking light – Pack Lighter by Reducing the Weight of Food in Your Backpack

Hiking light helps you have more fun. You feel less burdened, more invigorated, and closer to nature. To lighten your pack as much as possible, you need to become an expert at choosing light food. You can lighten the weight of the food you carry and maintain great nutrition and taste.

The most important food you carry is water. It's more important than other foods for survival and many bodily functions such as staying cool or warm. And since water is heavy, you need to carry enough without carrying too much. Reading your map and learning from others about water sources before you hike will reduce your water weight. In some areas you need to carry large amounts of water between sources. In other areas, you can drink large amounts when you're at water sources and not carry much in between.

The main thing to remember when you're planning your food is you'll need more than normal. Lots more. If you're hiking full days, you can plan for almost twice your normal calories. But don't fall into the trap of filling in the extra calories with packaged junk food. You don't need empty calories. You need nutritious calories.

For weekend trips, you can get away with less nutritious meals. You might even use the trip as a bit of a diet, within reason. But if you're thru hiking on the long trails, you'll quickly burn up your reserves and your body won't function well without good nutrition.

When you're hiking, good nutrition is much the same as it is anytime. You should stay well hydrated, get lots of protein, complex carbohydrates, and good fats. Eat fruits and vegetables, whole grains, seeds, nuts, and fiber. Veggies might be the biggest challenge on long trips, although you can find them in freeze dried form. They won't be as nutritious as fresh, but you'll still benefit from them.

When thru hikers reach main roads and civilization, they're often ready to gorge on all the wrong things like sugar-filled ice cream. It would be better to overload on vegetables that you've been missing.

Fruits are a little easier to pack than vegetables, because you can readily find fruit leather and things like dried apricots, banana chips, and apple chips.

Freeze dried meals are light, but are expensive and not always dense in nutritious calories. Become more of a label reader when you buy any processed food. On nutrition labels for freeze dried food you'll notice the meals are high in sodium, sugar, and fats. Your body can handle some of those negatives since you're burning so many calories, but they're not the highest quality calories. In recent years, there have been improvements to nutrition and taste in freeze dried foods. Experiment before your hikes to see what's healthiest and what you like.

To reduce the weight and bulk of freeze dried meals, always repackage them in lighter bags, and remember to keep the label and cooking instructions.

Many backpackers use energy bars as part of their diet, even substituting them for regular meals so they can hike without stopping. Energy bars are best used short term because they're nutritional value is questionable. This is another time to read the nutrition label. You'll usually find energy bars are high in sugar which translates to empty calories. Energy bars are often expensive and short on taste. Like many other foods, you may find better choices in the health food aisle of your supermarket. But shopping of the health food aisle doesn't mean it's all nutritious. And organic doesn't mean it's always healthy food.

Processed foods always lose some food value. Many processed foods, like instant noodles, are of questionable value anytime. For the first day or two of your hike you can take a lot of fresh food if you plan ahead. With practice, you can locate the foods that give the most nutrition for their weight.

For breakfast, granola and fruit meals work great. Oatmeal is a good starter. Whole grain dry cereals with powdered milk work well. Some hikers like instant puddings to get started.

Throughout the day you can snack on things like nuts or sunflower seeds which are high in calories and protein. Whole grain crackers or pretzels are good choices. I like organic blue corn tortilla chips. Trail mixes are great because the varied content is tasty and you need to sustain energy between meals. There are a wide variety of ingredients you can experiment with at your local supermarket.

Whole grain tortillas are becoming more available. Quick cook whole grain brown rice is easy to find. Dry soup mixes can be found in any store. I mix them with about 2/3 of the water recommended so it's quicker to heat the water and the soup is thicker. Dried soup mixes are a convenient extra meal to carry in case of an emergency.

String cheese is a good snack. Beef and turkey jerky are old favorites. Dried, refried black beans are nutritious and flavorful. Peanut butter is a favorite staple of many lightweight backpackers, and it's becoming available in small, individual packages. Tuna is now offered in small, foil pouches.

A food dehydrator can be a great investment for lightweight backpackers. You can experiment and find foods you really like. You can also package the perfect amounts.

Powdered sports drinks are a convenient way to replace electrolytes, and you can use them to flavor treated water.

Remember to take your vitamin pill. It can't replace a meal, but it supplements your efforts.

Food is a memorable part of any backpacking trip. You can trim the food weight in your backpack, increase your energy, and enjoy your meals and snacks.

Chapter 12: Hiking Light -- The 10 Essentials of (Ultralight) Hiking

The Ten Essentials is a list of gear to help keep you safe on any outing. It was developed in the 1930s by The Mountaineers, a Seattle-based hiking, climbing, and conservation organization.

You need to stay found, hydrated, fed, dry, and warm (or cool in desert regions). The best and lightest things to take on your adventures are expertise and good judgement.

With some planning most of the 10 items can be kept to under an ounce in weight, so they are not a burden to carry.

The Ten Essentials are:

1. Map
2. Compass (Could be supplemented with GPS receiver)
3. Sunglasses and sunscreen
4. Extra food and water
5. Extra clothes
6. Headlamp/flashlight
7. First aid kit
8. Fire starter
9. Matches
10. Knife

1. Map - To stay found, you need a map and you need to know how to use it. Know how to use a topographical map with your compass. It's an easy skill to learn. You can trim the weight of your map by taking only that part of the map in which you'll be hiking. Be sure to keep the legend intact, and keep enough of the map to show emergency exit routes and water sources.

2. Compass - A good compass doesn't need to be a big, heavy item. There are several quality brands that have models that weigh less than an ounce. If you require reading glasses, take them and don't lose them, because they are crucial in reading small print on most maps. If you add a GPS device, shop for weight as well as the features you want.

3. Sunglasses and sunscreen - These become more important at high altitude where sun and snow can cause eye damage. Shop for weight as well as quality when you buy sunglasses. A good pair of sunglasses can weigh less than an ounce. Keep the weight of your sunscreen very light by taking only a small amount in a ¼ or ½ ounce container. Don't forget lip balm that has sun protection.

4. Extra food and water - Since your survival depends on water, it's as important as anything on this list. You can save weight by carrying your water in light plastic bottles. By knowing your map, you can plan for water stops and not carry excessive amounts. Your water treatment can be ultralight by carrying iodine tablets or Aquamira tablets in small containers. For your extra food, take things that are dense in nutritious calories. You can last a long time without food, but your extra food will help you stay warm, give you energy, and help you make better decisions.

5. Extra clothing – You need to stay warm if temperatures drop. Extra clothing should include rain gear. A light skull cap keeps heat in, and can weigh less than an ounce. Polypropylene gloves can weigh less than an ounce, too. Avoid cotton clothes. Synthetic clothing is more functional because it dries more quickly. Clothing weights vary greatly. A digital scale can be helpful when purchasing backpacking clothing because it's difficult to estimate clothing weights.

6. Headlamp/flashlight - It's not a bad idea to take both, especially if you have a lightweight version of both. A headlamp let's you work with both hands. The lightest headlamps are only about 1 ounce. The lightest "squeeze" lights are only ¼ ounce. Remember to take spare batteries and bulbs. Your light also functions as a signaling device.

7. First aid kit - Start with a very small first aid kit. Then personalize it. To keep it light, store it all in a ziplock bag. Add butterfly bandages, packets of triple antibiotic ointment, and extra moleskin. A small roll of surgical tape will help you treat large wounds. Take aspirin, ibuprofen, biodegradable soap, and personal medications. Repair gear, such as duct tape can be part of your first aid kit. Your best first aid equipment, planning and knowledge, are better than ultralight. They're weightless. Keep in mind that handling your stove and hot water are times you need to be alert, especially when you're tired. On unsteady ground, plan how you might fall to your hands and knees to avoid an ankle sprain. Simply making sure your hands are washed with water and a little biodegradable soap, especially after defecation, will help you avoid some of the most common physical ailments that backpackers encounter.

8. Fire starter - Having a fire on a cold night can be life-saving, both for warmth and signaling. Extra toilet paper can double as a fire starter. A butane/propane stove can be a fire starter. Chemical heat tablets, a little fire starter paste, or a small magnesium stick can start a fire. Dryer lint is one of the lightest fire starters. Keep it dry in a ziplock bag.

9. Matches - Always carry windproof and waterproof matches. A package of 20 matches weighs only 6/10s of an ounce.

10. Knife – Use it for first aid, cutting shavings for fire, or for repairs. Your knife doesn't have to be big and heavy. You can find a quality knife that weighs less than an ounce.

You'll notice that the list of Ten Essentials differs from list to list. Some people put the map and compass together. Some put the matches and fire starter together. Others separate the food and water. You'll notice that some lists add items like an emergency blanket or signaling devices such as a mirror and whistle. An emergency blanket weighs only 1.8 ounces. A 3" by 4" mirror made of lightweight acrylic weighs only .8 ounces. You can use a whistle far longer than you can shout, and it carries much farther. An ultralight whistle weighs only .2 ounces. If you have cell phone coverage, you have a great signaling device. In some areas, insect repellent may be considered essential.

Carrying these basic items increases your chances of being prepared for an emergency. Your gear selection should always be based on your level of experience and local conditions.

Plan carefully so you always carry the 10 essentials of hiking. And have more fun by keeping them ultralight.

Chapter 13: 3-Day Ultralight Backpacking Gear List

Dear fellow backpacker,

I'm on the sunset side of 60, but even when I was in my teens and twenties I had fun reducing the weight of my pack.

When I was young, strong, and full of energy I still couldn't understand carrying a heavy pack. Backpacking is infinitely more enjoyable when you're carrying a light load and getting closer to nature. Hiking should be closer to walking than hauling.

So, for over 40 years I've been working on ways to lighten my pack — without sacrificing comfort.

I get lots of requests that say things like "I have knee problems and need to get my pack down to 35 pounds." Ouch!! Why not get under 20 pounds so you can float along and really have fun!

Much of a heavy pack comes from the overkill of carrying winter items. If your biggest weather threat is a summer shower, backpacking should be simple. For starters, most people use a sleeping bag that makes them sweat in summer. It's easier to use one of the Western Mountaineering bags — then if you go on a trip that's going to be a little cooler, just add a silk liner. It's just 4.7 ounces, and the liner keeps you another 9 ½ degrees warmer.

Once you commit to a light pack, you can save a lot of weight on the pack itself. Many packs weigh 7 pounds or more. And the manufacturers have the nerve to say how "comfortable" they are. Your knees and ankles know the total weight you're carrying.

Notice how these products are as comfortable to use as heavier ones, and in most cases more convenient because they're small and simple.

People have asked me for a specific list of how I can get my pack weight down to 15 pounds. Here it is -- including clothing and food. You can modify it with a tent instead of a bivy sack and so on. Put the pencil to it. It works!

Add up your heaviest items, the pack, sleeping bag, bivy, pad, rain gear, stove, and fuel and you're still under 7 pounds — the weight of many packs alone! Choose the larger pack and the tent, and you're still under 8 pounds. Then see how light your total can be, including food and water.

Your 3-day pack can be only 7 lbs. 12.7 oz. plus water. No smoke. No mirrors. These are the real weights of each item and the real total. You can switch to the larger Six Moon Designs Starlite pack, the Six Moon Designs Lunar Duo tent, and an Insul™ Mat air mattress and still be at only 11 lbs 5.5 oz.

Here's a convenient Microsoft Excel Spreadsheet so you can compare gear.

Have fun,

Steve Green

3-Day Lightweight Backpacking Gear List

Item	Weight	Description
Pack	16.0 oz	Six Moon Designs Swift (2,900 cubic inches)
Or	24.3 oz	Six Moon Designs Starlite (4,100 cubic inches)
Or	20.0-26.0 oz	Katahdin pack (3,350 cubic inches)
Or	19.0 oz	Granite Gear Virga (3,200 cubic inches)
Or	32.0 oz	Granite Gear Vapor Trail (3,600 cubic inches)
Or	48.0 oz	Granite Gear Nimbus Ozone (3,800 cubic inches)
Sleeping bag	18.0 oz	Western Mountaineering HighLite 6' (with stuff sack)
Shelter: Bivy	6.6 oz	Equinox Ultralite Bivy Cover
Or	7.2 oz	MontBell Bivy
Or	15.1 oz	Lightweight Equinox tarp (using 6 titanium stakes)
Or	23.0 oz	Six Moon Designs Lunar Solo (Pole +1.8oz.)
Or	11.0-14.0 oz	Six Moon Designs Gatewood Cape/Shelter w/ stakes & pole
Or	16.0-19.0 oz	Six Moon Designs Wild Oasis w/ stakes & pole

Item	Weight	Description
Or	24.5 - 42.0 oz	Contrail, Squall2, Cloudburst2, Double Rainbow, or Rainshad-ow2 Tarptent
Or	40.0 - 44.0 oz	Six Moon Designs Lunar Duo (Pole +1.8oz)
Or	43.0 oz	Sierra Designs Light Year
Sleeping pad*	10.0 oz	72” x 20” x 3/8” closed cell foam pad
Or	20 oz	Insulmat Air Mattress 72”
Rain gear	9.5 oz	Rainshield Rain Wear (large)
Or	18.0 oz	Mont-bell Versalite (medium)
Stove	1.9 oz	White Box stove w/ base & windscreen
Or	1.9 oz	Snowpeak titanium - Very quick and convenient
Fuel	7.0 oz	White Box stove: 2/3 oz. boils 2 cups. 6 oz. and 1 oz. container
Or	7.0 oz	Snowpeak 70% butane/30% propane cartridge
Mess kit, cup	4.6 oz	Titanium kettle, plus plastic cup
Spoon	.2 oz	I take spoon only, shortened for weight & to fit in cook kit
Knife	0.7 oz	Gerber ultralight knife - Super strong for its size
Water bottle	1.4 oz	32 oz./1 liter soda or water bottle
Towel	.7 oz	Using about 1/4 of the towel on the web site

Item	Weight	Description
Mirror	.8 oz	Use it for grooming & as an emergency signal device
First aid kit	1.0 oz	Add your items to our kit & place in a lighter ziplock bag
Flashlight(s)	.5 oz	The weight is for 2 Pulsar II's
Compass	.2 oz	Sun Minicomp II
Matches	.5 oz	2 book matches & a few water/ windproof in 2x3" ziplock bag
Emergency Blanket	1.8 oz	Very light for the peace of mind it offers
Whistle	.2 oz	Weighs about 1/2 regular plastic size & 1/6 metal size
Insect repellent	.4 oz	Ultrathon with DEET in 1/4 oz. container
Biodegradable soap	.4 oz	Campsuds in 1/4 oz. container
Sun screen*	.4 oz	Your favorite in 1/4 oz. container
Lip protection*	.3 oz	Your favorite with SPF protection
Water purif. tablets	.6 oz	40 Potable Aqua tablets in the 1-dram bottle
Toilet paper	1.0 oz	Don't try to go too light on this one!
Cord*	.4 oz	25 feet of very lightweight nylon cord for general use
Garbage bag*	.4 oz	Large re-sealable bag (10 1/2x12") found in all supermarkets
Short-sleeve shirt	2.5 oz	Silk shirt - Warms when cool, wicks moisture when hot

Item	Weight	Description
Or	4.9 oz	Short sleeve shirt. Only The Lightest Performance Shirt.
Or	5.6 oz	Long sleeve shirt. Only The Lightest High Performance Shirt
Socks	2.0 oz	Wigwam Mid Hiker™ (large size)
Running shorts	2.8 oz	Lightweight nylon running shorts pack small, dry fast
Underwear*	1.5 oz	Use lightweight bikini brief style or silk boxers
Map*	1.5 oz	Trim if desired - Don't cut legends, side trails, etc...
Pencil, paper*	.2 oz	Small pencil & paper for emergency messages and notes
Sunglasses*	.8 oz	Choose a lightweight style; protect in a ziplock bag
Toothbrush*	.2 oz	Pick one with small brush area, cut handle in half
Toothpaste*	.6 oz	Small sample, half empty. Or use powder or baking soda
Comb*	.1 oz	Smaller than average, and cut in half
Car Key*	.2 oz	Take just the one you need; tie small bright cord to it; drill and file much of the weight out
Cash & ID*	.3 oz	I always carry some cash, 1 credit card, and drivers license
Rubber bands/pins*	.4 oz	Rubber bands, safety pins, tape, needle & thread

The clothing items above are your extras. Of course, you can reduce overall carrying weight by wearing lightweight clothes to begin with, too.

Food* for 3 days

The following weights are achieved by removing packaging from the MountainHouse freeze dry products and placing them in sandwich-size ziplock bags.

Meal	Weight	Description
Breakfasts (3)	4.1 oz. x3 = 12.3 oz	Mountain House granola, blueberries & milk
Lunches (3)	2 envelopes = 4.7 oz	Lipton dry soup mix, rated at 6 total servings
Dinners (3)	3.5 oz. x3 = 10.5 oz	Mountain House entrees. (Add 6 oz. for double servings)
Kool Aid	.4 oz	Pre-sweetened

Total food weight = 27.9 oz.

Optional Items

Item	Weight	Description
Water filter	5.3 oz	The Timberline filter is very fast and light
Or	5.3 oz	32 oz. Bota Remove the weight of your other water bottle
Or	8.0 oz	Katadyn Ceramic Mini Filter
Or	11.0 oz	Pur Hiker Water Filter

Item	Weight	Description
Gloves	1.0 oz	Polypropylene gloves are warm, light & compact
Hat, cap, or visor	.7 oz .8 oz 1.2 oz	Skull Cap Field Cap Pileus Hat
Camera*	Varies	Several brands make very light models
Deodorant*	.3 oz	Arrid makes a cream that can go in a small, plastic container
Dental floss*	.1 oz	Put some in a 2x3” zip seal bag
Scouring pad*	.1 oz	Cut about 1/3 from the regular size
Fire starter*	.5 oz	Wind & waterproof matches & stove should be enough....
Hiking Poles	14.8 oz	Leki Titan poles
Inner jacket	5.7 oz	mont-bell Ex Light Down Inner Jacket
Thermawrap jacket	8.8 oz	mont-bell Synthetic Jacket
Down Pants	6.7 oz	mont-bell Inner Down Pants
Thermawrap pants	10.2 oz	mont-bell Synthetic Pants
Umbrella	5.8 oz	mont-bell’s Ultralight Trekking Umbrella
Gators	2.0 oz	MontBell Stretch Gaiter
Mosquito Head Net	.6 oz	Great protection if bugs are thick
Reading glasses*	.5 oz	I take the tiny folding kind
Medications*	Varies	Not optional, but their weight adds to the total
Reading Material*	Varies	Some folks like to take some light reading

Total weight before water: 7 lbs. 13.4 oz.

Add a solo tent and you would carry about 9 pounds. Add an air mattress and you would carry about 9 1/2 pounds.

There you have it. A checklist of where you can make the most weight savings to lighten up and have more fun. Happy camping!

This chart is figured for solo camping. When hiking as a pair, you can make some other small weight savings.

Clothing

Here's a sample of the gear I'd be wearing:

Item	Weight	Description
Socks	2.0 oz	Wigwam Mid Hiker™ (Same as list above)
Shoes*	1 lb. 15 oz	New Balance 801 Trail running
Silk T-shirt	2.5 oz	Same as in web page
Long-sleeve shirt	7.4 oz	RailRiders, Roll-up tabs convert it quickly to short-sleeve
Pants	8.0 oz	RailRiders, Adventure Khakis
Underwear*	1.5 oz	Bikini brief style or silk boxers

* These are the only items not found on our website

Chapter 14: Make Your Long-Distance Hike More Fun By Hiking Light

Planning a thru-hike of many weeks or months on one of the major trails adds some extra challenges to ultralight hiking. Physical conditioning and resupplying are key ingredients to a successful lightweight hike.

Even before you start putting together your resupply packages, you need to start conditioning your body. If your feet and legs are in good shape, your chances of success are much higher. Remember that about 40% of thru hikers stop before they complete their planned trip, so do your best to eliminate the common causes for not staying on the trail. The best way to prepare for hiking is to hike. Seems simple, but while you're busy with everyday life, carving out enough time to get in trail shape will be difficult.

You can do cardio and the stair master at a health club, but that's not the total answer. You need to hike and hike a lot in the shoes you'll be using for your long-distance hike. If you plan on hiking the full length of one of the major trails, remember you may need to break in two or three pairs of shoes. When moisture drips down into your shoes, it's the same as if you forded a creek, so it's good to get your feet in shape by hiking when they're wet. Start your hike with socks that give you plenty of padding because your feet will tend to swell and even lengthen on long trips.

It's bad planning to think you'll get in shape as you start hiking. Since you won't have a lot of recovery time as you begin your long-distance hike, you need to be in shape when you start. Hiking shorter mileage days at the beginning of your trip may be more reasonable, but it's not the easy answer. Before you start your long hike, your training hikes can prepare you better if they have lots of ups and downs. Older hikers are in danger of having knee problems especially on steep descents.

Staying hydrated and well fed is probably more important than you think as you begin your hike. If you're like most hikers, you'll lose weight anyway, so eat well and drink well from the beginning. Drinking a lot will tend to keep joints lubricated and your muscles won't be as sore. Start out with extra ibuprofen and hope you won't have to use too much as the days progress.

If you're planning this hike with a partner, remember that they might drop out while you want to continue. Make sure you take all the equipment you need and don't rely on anyone else. Your pace may be faster or slower than a partner, so being independent will give you peace of mind if you're behind or ahead on the trail.

Your training hikes are a good time to test all your equipment. Desert hiking at the beginning of the Pacific Crest Trail will require different gear than the Sierras or Northern Cascades. Test everything that you'll use. You may enjoy not using a tent in the desert. Know how much room a bear canister will take in your pack if you're hiking the Pacific Crest Trail. Be comfortable with your rain gear on the Appalachian Trail. Sharpen your map using skills on the Continental Divide Trail since it's not as well defined. If you use permethrin to keep insects off your clothes, remember to treat all the clothes you'll have your support person send during the hike.

Have access to your money, and remember that nothing will cost less than you expect, but there will be lots to spend your money on, especially in trail towns. When you get to a town, you'll probably want to treat yourself to restaurant meals, a warm bed, and other things that drain your budget. If you're lucky, you'll be enjoying the rhythm and feel of the trail, and want to get out of town as soon as possible. Most thru hikers carry a paid-up credit card or debit card, or both. Remember that paying your credit card is something your support person should be able to help with, so leave a few signed checks behind. Most hikers carry a phone card with plenty of minutes. And it's always good to have some cash for times when a credit card won't work.

You may wish to carry a camera or journal even though you don't normally take them on shorter hikes. Both can be great for recording one of your life's great adventures. One of the great preparation tools for your hike can be the journals of other hikers. You'll get fired up for your hike and gain valuable insights at the same time.

Resupply points and how to use them will be one of the most important parts of your planning. This is a good place to learn from others. If you google the name of your trail, you'll find a list of resupply points and the ins and outs of using each one. You may wish to skip some resupply stations that are too far off the trail. Some are post offices while others are post offices in stores or resorts. Others are resorts or businesses that have agreed to be resupply points. Post offices will be closed on weekends and holidays. Some small towns will have very few services. Always include your approximate date of arrival and a return address on the packages you send.

It may seem very difficult to hitchhike into some towns, but asking for rides at the trail heads or campgrounds might be easier than you think. People like to hear about the adventures of long-distance hikers, especially other hikers. At times like this, it's good to clean up as much as possible and have a bit of deodorant in your pack. Asking for a ride while you're still near the trail gives female hikers a chance to be more selective in choosing rides

Many long-distance hikers don't like to send all their food to resupply stations. You may like the taste of something at the beginning of your hike and grow tired of it. Freeze dried food is expensive. Learning good alternatives could pay for much of your adventure. It's very expensive to mail heavy packages to each resupply point. With the amount you pay for priority mail, you could buy much of your food. That's another reason to experiment a lot with food before your hike. Become an expert of what you can buy even in small and medium-size grocery stores. Read more on what other hikers have done. You may carry a little more weight, but you can leave each resupply point with exactly what you have chosen at the time, and not be locked into what you planned months ago. You need to be realistic. You may be in that group that doesn't hike the full length of the trail. Your mind may be strong, but your knees may be weak. If you're carrying a credit or debit card, you're sure of being able to buy food. If you mail a number of resupply packages, some may not be waiting for you, even if you or your support person does a perfect job of mailing them.

You can choose to eat the things that are heaviest and most perishable first after you resupply to balance your diet and keep your pack light. Some hikers like to have cereal and powdered milk for breakfast so they can get hiking quickly in the morning. You may choose to have zip lock bags as one of the items mailed ahead in your "bounce ahead" box. That way, you can measure your individual meals. Some hikers don't like to stop for lunch, so they have snacks or energy bars. Some people use energy bars for other meals to save cooking time although these meals aren't as nutritious and balanced as you might think.

Try to have a well-rounded diet when you're thru-hiking. Your body will not be as strong if you're not getting a complete diet. If your endurance is low, your positive outlook can be affected. You may feel like ice cream when you reach a trail town, but if you've been missing your vegetables, it may be time for a salad or veggie platter. On weekend hikes it's not as important to have a balanced diet. You can adjust when you get home. It may be good to make your weekend hike a bit of a diet and consume less calories than you burn. But on a long-distance hike, you need to adjust and consume plenty of good, natural foods that are dense in nutritious calories. Of course, you'll burn far more calories than normal. As always, you'll want to drink lots of water, and remember to drink before you're thirsty.

Plan to send the personal items you need that might not be on your regular backpacking gear list. For instance, you'll want a pair of nail clippers so your socks don't get worn out. In this box that always gets sent ahead to your next resupply station, you'll want to include tape, a felt pen, and postage for all the times you need to forward the bounce ahead box. If you mail a package using priority mail and don't open it, you can forward it for free. If you need to open a package or your "bounce" package, it's fairly inexpensive to mail it forward since you will always mailing it within the same zone.

Here are some specific pieces of gear that may change as you hike, or need to be resupplied. You may need to change sleeping bags if you're hiking north or getting into the fall season. A sleeping bag liner may give enough extra warmth, and you could just send it to one of your first cooler-weather stops. Some people change stoves as they get into colder weather. It's always easier to find denatured alcohol than it is to find butane/propane cartridges. The cartridges can't be mailed. You may use different water purification methods as your hike progresses. You may start with a water filter on the southern end of the Pacific Crest Trail and use iodine tablets or nothing at all as you get farther north.

You'll want to treat yourself to new socks at intervals along the trail. You may start out with a pair of water repellent shoes on the Appalachian Trail and switch to breathable shoes as the days get warmer. You'll want to add more cold-weather clothing if you're hiking north. Your rain gear needs may diminish in mid-summer and then return in fall. You may want to send an umbrella ahead or send it home. There may be parts of the trail that require a mosquito head net.

For your first aid kit, you may find that only band aids and moleskin need to be sent to resupply points. Insect repellent, soap, and sunscreen can be sent in small containers. Small amounts of tooth powder and deodorant can be included.

Flashlight batteries and bulbs can be bounced ahead. Don't forget camera film and batteries. If you forward the various sections of the guidebook that describes your trail, you never have to carry more than a few ounces for a very complete map.

Careful planning can keep your pack light for your entire trip. Plan ahead. Have more fun every day of your hike by hiking light.

Chapter 15: Hiking Light – When Day Hiking You Can Have Fun, Travel Light, Train, and Test Gear

Day hiking is a great way to get out and enjoy nature without a lot of planning or expense.

In many ways a day hike combines the best of all worlds. You can enjoy the beauty of nature and sleep in a warm bed at night. You can have a restaurant meal or a home-cooked meal after your hike. Day hikes are simple and easy to plan. You can go at the last minute if the weather looks good.

One of the obvious benefits is you can carry very little weight because you won't be camping overnight. Because you're traveling light, you can cover a lot of distance if you wish. Day hiking helps you cover a long distance because you don't have to break camp in the morning or set up camp at the end of the day. Since you're only out for the day, you don't need to carry a stove and cook. You can carry a sandwich or other simple food that can be eaten as you hike.

If you hike with friends you can take two cars and drop one at a trailhead, then drive and park at another trailhead and hike back to the first car. That way, you'll have the freedom to enjoy hikes that aren't "out and back" or "loop" hikes.

To be well-prepared, you should carry the 10 essentials of hiking, even though it's a day hike. The 10 essentials are:

1. Map - Carry a small, light map in case you change your route.

2. Compass – Carry at least a very light one. A light GPS is optional.

3. Sunglasses and sunscreen – Weigh sunglasses to find the lightest. Apply sunscreen before you leave.

4. Extra food and water – Have some of each. Plan so your food is very light.

5. Extra clothes – Carry rain gear to be safe. It can be as light as a garbage sack. Take light layers, light gloves, and a light, wide-brimmed hat. Avoid cotton.

6. Flashlight/headlamp – It can be less than an ounce by using a squeeze light.

7. First aid kit – Keep it small and simple. Include moleskin and blister care.

8. Fire starter – Take something very light like a magnesium stick or dryer lint.

9. Matches – Take some that are waterproof/windproof, too. It's light insurance.

10. Knife – You can find a quality knife that weighs less than an ounce.

You could add an emergency blanket, which is less than 2 ounces. A small, acrylic mirror for signaling is less than an ounce. A tiny, plastic whistle is only 2/10s of an ounce. It's good to have a watch so you can estimate sundown and know when you should be back at the trailhead. In some areas, you can have coverage if you take your cell phone. Extra socks can be handy if it's cold and you get your first pair wet. Carrying some toilet paper in a ziplock bag is a good idea for obvious reasons. Apply insect repellent before you leave the trailhead, or take some in a very small container. All these things can be carried in a pack or fanny pack that by itself weighs just a few ounces.

Avoiding bulky clothes will help you carry a light, compact pack. Choose clothes that are light and thin, but have good insulation value.

There are books with suggested day hikes for most areas of the country. These can help you get out more often because they offer a nice variety. A photocopy of the map of your hike can serve as a light map. You can pack lighter by carrying less water if your map shows water sources. A simple plastic water bottle is the lightest way to carry water.

Day hikes are a great way to get in shape for longer hikes. The variety of hikes in a guidebook can help by offering easy to difficult hikes. Day hikes are a great opportunity for testing or breaking in new gear such as moisture-wicking clothing, running shoes, or other new gear. You can test different lightweight foods. If there's any difficulty, you're home that night and the hike is over. That's one of the great advantages of a day hike. You can fix anything that went wrong before the next hike.

Your day hikes can be more enjoyable when you pack ultralight. Day hikes can be full of variety, spontaneous, and inexpensive. And you can do some valuable training and testing while you're having fun.

Chapter 16: Hiking Light – Share the Load with a Friend so You Can Both Carry Less Gear

If you're hiking with a friend, sharing the load is another technique to lighten up. Some quick math tells you a 4-pound tent becomes a 2-pound tent if you're sharing the load.

When you split up the weight of a tent, the tent body is usually about equal to the fly, poles, and stakes. Each person should have enough of a shelter to be safe if you become separated, such as an emergency blanket. Each hiker should carry the 10 essentials in case you split up.

Cooking gear is another area where you can share weight. But kitchen items are the same as all shared gear. It only works if you stay together.

The dynamics of a hiking buddy compared to hiking with your spouse are far different. Couples tend to stay closer together even if they have different hiking styles. Husbands tend to carry a little more of the load. That seems reasonable since the husband often talks the wife into coming along. It's only right to make sure she's comfortable and happy. If you're hiking with your spouse, you may be able to save some weight by sharing your sleeping gear. The shared body heat allows you to have a somewhat lighter system. If the pad underneath you is comfortable, you can have a very light layer under you and single, fully-opened semi-rectangular bag over you. Or, you may choose to use two, connected bags that are lighter than what you would have used individually.

Before you divide the gear with a friend, be sure your hiking styles are compatible. Are you both in good physical shape? Do you enjoy roughly the same pace? Do you break camp at about the same time in the morning? Do you like the same number and length of rest stops during the day? Do you stop at about the same time? Would you prefer to have some separation while you hike? Do you enjoy the same types of camp at night? Some people like to use established camps at night that are near water. Others like the solitude of being away from water and camping where others have never camped.

A camera and other non-essential gear are good items to share. Pictures can be shared when you get home.

Think of ways you can share gear with a hiking partner. If you're compatible, you can both lighten your load and have more fun.

Chapter 17: Hiking Light – Solitude Camping Avoids Unwanted Crowds and Animals

One of the reasons we go backpacking is to escape the crowds. But how tempting is it at the end of a long day of hiking to camp at an established site where others have camped?

There are many advantages to what can be called “solitude camping.” You can avoid unwanted numbers of people and bothersome animals, especially bears. Some people call this stealth camping, but this term makes it seem like a military exercise or that you’re paranoid or antisocial. Those who use the stealth term seem to suggest that this type of camping is new when it is obviously as old as camping itself. So, let’s call it solitude camping, or pick any term you like such as isolation, unseen, or hidden camping.

Much of the time, solitude camping could also be called dry camping, or setting up camp far from streams or lakes. Dry camping is not only easier than it sounds, it has many advantages. There is definitely an attraction to camping beside a beautiful lake or listening to a tumbling stream. But there are many advantages to dry camping. It’s easier to find a pristine, untouched camping spot.

Many hikers spend a lot of time worrying about bears invading their camp and stealing food. In some areas, this is a very legitimate problem. By camping away from water sources, you can be far from where bears will be looking for food. With their keen sense of smell, bears can be regular visitors to an established camp site. Even if you don’t cook at a well-used site, the bear’s routine and lingering food smells can lead to food raids.

You’ll have fewer pests like raccoons, mice, chipmunks, and squirrels when you dry camp. There will be fewer insects if you camp away from water and places where pack animals have stayed. Your tent will have less condensation if you’re away from the moist air near water.

It’s easy to cook before you finish hiking each day. When you’re at your last water source for the day, you don’t have to stop hiking. Enjoy your meal and cover a little more ground before you go to bed. Carry enough water for the night. When you stop, you’ve left the cooking smells far behind. Do what you can to mask all food odors when you do choose a campsite. For example, don’t leave a package of beef jerky open around camp.

If you like to clean up with water before going to bed, just clean up at that last water source, keeping the correct distance between you and the water, of course. Some trails have long distances between water sources, so you're forced to dry camp, and you need to know how to get reasonably clean with a small amount of water. You'll be surprised at how much personal cleanup you can do with just a few ounces of water. Carry one ultralight towel for kitchen use and one for body use. Moisten the towel, clean, and squeeze the towel. You'll feel more confident about hiking between water sources with a little practice. You can save more of your water for drinking.

Don't be locked into the idea that you need to eat breakfast in camp. You'll be more flexible if you sometimes break camp and hike to the next water source for breakfast. It can give you a good rhythm since you've hiked a ways and are ready for a break.

Sometimes solitude camping can be fairly close to a small water source if you hike a ways to get off the main trail. Camping a little distance from a small trickle can give you the best of both worlds.

Whether you enjoy camping solo or with your own group, camping away from others helps you feel closer to nature. An overused campsite always shows the same human impact. There's an unsightly fire ring and an area that is stripped of all vegetation. The ground is so hard it's difficult to get your tent pegs all the way in. There's unburned foil from freeze dried food packages, scraps of paper, and unburied toilet paper. Even if you can't see it, you know you're close to dishwater, toothpaste, a few urinals, and pack animal excrement. When you walk around, you stir up dust and ash and then take them into your tent.

By contrast, when you solitude camp, you may be the first person that's ever stayed at that site. It's cleaner, softer, and in it's natural condition. When you camp away from established campsites, it's easier to choose a place where rainwater won't run or pool.

When you leave in the morning, make sure it looks totally natural in case another hiker has your great skills and someday picks that same spot.

Solitude camping, or dry camping, can make you feel closer to nature by being truly alone. You'll also enjoy the benefits of a clean, totally natural campsite.

Chapter 18: Hiking Light – Ultralight Trail Hygiene

Ultralight trail hygiene is pretty simple, and the necessary gear can be very light. A little experience will help you figure out the important principles.

We all enjoy the freedom of the outdoors. We come to expect and be comfortable with a certain amount of trail grime. But a reasonable amount personal hygiene will help us enjoy ourselves more by being refreshed. Good hygiene shows a respect for others and the environment, too.

Here's the most important information first. Most of the gastrointestinal problems hikers have while in the outdoors are not caused by giardia, but by not cleaning their hands after defecating or not cleaning their cookware properly. If you take care of those two potential problems, you'll increase your odds of a happier hike.

When you need to defecate in the woods, use a privy where available. If a privy isn't available, find a place at least 200 feet from water sources and the trail. Dig a hole with a stick. You don't need to carry a trowel. It's extra weight and could become unsanitary. Make the hole about 6 inches deep. The top layer of soil is best for decomposition. If you use toilet paper instead of natural materials, make sure you use white, unscented paper. It's more biodegradable. When you're finished, place the paper in the hole, too. Cover with soil, and if possible, place a rock or bark over the area to discourage animals from digging.

If you use wet wipes, and it's legal to build a fire, you can burn the wipes thoroughly in a hot fire. If you can't have a fire or don't want one, you'll have to carry out the wet wipes. In some areas, you may have to carry out your excrement. Be prepared with a lightweight double-bag system.

Wash your hands with just a few drops of biodegradable soap. There are several popular brands that can be used for hands, face, body, hair, clothing, dishes, or anything washable. You can transfer some of the soap to a ¼ or ½-ounce container and have plenty, even if you're hiking long distances between resupply points. Some hikers also like to use an antibacterial hand sanitizer, or a soap that is both biodegradable and antibacterial. There are studies that indicate antibacterial products are not as helpful as advertised and that washing only with soap is as effective as using an antibacterial soap.

When you urinate try to stay 200 feet away from water, trail, and campsites.

When you need to clean your body, fill a water bottle and take it away from streams and lakes. This keeps your body dirt, oils, sweat, sunscreen, and insect repellent from contaminating water sources. With a small amount of water, you can do a great deal of cleaning. Put a little water on your towel and a drop or two of soap. You can use a very small camper's towel. Use one small towel for bathing and one for kitchen use. Wipe the dirt from your body, and then rinse the towel. Repeat the process until you're finished. If you're not alone, you can do a great deal of cleanup while wiping with the towel under your clothing. You can get quite clean using very little water inside your tent. This is a very helpful technique when dry camping and water sources are far apart.

Cleaning your feet helps avoid blisters and athlete's foot infection. The dark, moist, warm area inside your shoes is the perfect environment for athlete's foot problems. It's nice to clean your feet at the end of the day and wear the next day's clean socks to bed.

You can wash your hair using very little water and soap, too. Short hair is the easiest to clean and maintain. Consider a haircut before any long hike.

Brushing your teeth when you're camping can be ultralight and easy. To save a little weight, you can cut your toothbrush down a little in size. To drive your hiking partners crazy and have a little fun, you can drill holes in the handle and act like it's a huge weight savings.

Instead of toothpaste, consider using tooth powder. It's lighter and more environmentally friendly. Tooth powder is still available in more stores than you might imagine. You can find more natural brands in health food stores. If you google "tooth powder" you'll find recipes to make your own. They can be as simple as 3 parts baking soda and 1 part salt. Any powder can clog the sealing portion of ziplock bags, so keep your toothpowder in the smallest, lightest plastic container you can find. Some hikers brush without toothpaste, citing studies and experts that say brushing your teeth is important, but toothpaste isn't.

Remember you need to use clean water to brush your teeth, and clean water to rinse your toothbrush. If you rinse your toothbrush in water that's contaminated with giardia, it's still contaminated when it's dry. It's a good practice to rinse your toothbrush in very hot water when you get home.

It helps to maintain good oral care by flossing your teeth when you're backpacking. You can keep the floss ultralight by taking enough individual pieces for your hike and keeping them in a very small ziplock bag. The floss can also serve as backup string for repairs.

Cleaning your cookware is important when you're backpacking. Always wash your dishes far from water sources. Just as you use very little soap when bathing, you should use very little when washing your cooking gear. If you leave too much soap residue on your dishes, it can lead to diarrhea.

You can reduce your cooking gear weight and cleaning time by using only one kettle for cooking and eating. Cleaning your kettle is easier if you scrape as much food as possible from the kettle as you finish eating. Many meals leave a thin layer of grease on your cookware. Rather than using a lot of water to remove the food and grease, it's usually easier to use natural materials such as leaves, needles, or sand to clean your kettle. When it's nearly clean, you might want to finish with one or two squares of toilet paper. Of course, the toilet paper should be burned or carried out with your trash. Save weight by leaving the scouring pad at home. They get dirty quickly and hold bacteria. Boiling the water for your next meal will disinfect the kettle. If you have cold cereal such as granola for breakfast, it's best to eat it right from the bag so you are never using a potentially dirty kettle.

Of course, when you get home you should clean your cooking gear. That's a good time to remember to clean, or replace, your water bottle, too.

Cleaning your clothing, especially your socks, is important on long hikes. When the weather is warm, you can put on the rain gear and clean your shorts, pants, and shirts. Long-distance hikers should experiment with their clothing before their hike to see which gear dries more quickly. If you like several types of socks about the same, you might as well use the ones that dry fastest while hanging on the back of your pack.

Most hygiene in the outdoors is common sense. Concentrate on keeping your hands and dishes clean. Practice the standards that will help you feel refreshed. You can do these things while packing ultralight.

Chapter 19: Hiking Light – Buy a Scale and Weigh Every Piece of Gear You Carry

It seems so logical. Backpackers know reducing the weight of their pack will increase their hiking enjoyment. And they know a scale will give them precise weights. But how many hikers never get a scale? They seem to say, "I can eyeball it and be accurate" or "It won't make that much difference."

You can reduce your carrying weight without a scale, but why not take out the guesswork? How much lighter is a pair of nylon hiking pants compared to your denim jeans? The scale will tell you the nylon pants weigh about 8 ounces instead of one pound 8 ounces for the jeans…3 times as light! You can save a full pound and have more functional gear! Your do-everything knife and repair tool seems like a fairly small thing, until you weigh it. Some people carry a knife that weighs as much as 20 or 30 small items an ultralight backpacker would carry. A small, simple knife that weighs less than half an ounce is probably all you'll need.

You may have read that some lightweight backpackers repackage their food into ziplock bags because it's lighter. If you're skeptical, but never tested the principle on a scale, you'll never know how much you can save. It's usually a high percentage of the overall weight of the meal.

When you use a scale, it's guaranteed you'll be surprised at some of the weights of your gear. If you've been relying on manufacturer's weights, you'll immediately find they are very unreliable.

When you buy a small, digital scale, you'll find it's handy around the house, too. You can get extra use from it in the kitchen. If you keep some stamps of various denominations around the house, you can do your own weighing and posting of letters and packages and avoid long lines at the post office. How many times have you added a second stamp to a letter when you weren't sure if it was 1 ounce or 2 ounces?

You can find a quality scale that measures in 1/10 ounce increments for about $30. These scales generally weigh items up to 5 pounds. The scale itself is easy to carry around and weighs a little over a pound. A good place to buy your scale is at an office supply store.

You shouldn't have any items of gear that weigh over 5 pounds. If you do, your friendly neighborhood post office will probably be happy to weigh them for you if you combine it with some other postal business. Share your fanaticism with them. Maybe you'll interest someone new in ultralight backpacking.

When you have a light, portable scale you can take it with you into stores and make wise decisions before you buy. The scale can pay for itself in the gas you save. By checking the weight of an item while in the store, you can avoid buying gear, weighing it later and being disappointed, and then taking it back to the store for a refund.

Don't be embarrassed to take the scale into a store. People who sell backpacking gear should have an idea of the weights of the items they sell. They often don't have a very good idea of the weight of their gear so you're helping them by giving them free training. If the weight of a piece of gear is printed incorrectly on the packaging, you can enjoy watching the salesperson try to explain the discrepancy.

Once you purchase your scale, start making notes on the weight of all your gear. Remember that your total load includes clothing and food. You'll make some nice weight savings in these areas.

Weigh the items that are on your body, but not in your pack, too. The things in your pockets and the hat on your head are all being carried. Once you've purchased your scale, you can weigh things like that heavy leather belt. That should be one of the first items you change.

When you weigh clothing, it's handy to have a few rubber bands around because clothing is generally unruly to weigh and wants to fall off the edges of the scale. Of course, you can subtract the weight of the rubber bands after you weigh an item. You can put multiple items on the scale for really close calculations. For instance, it takes about 28 of those large rubber bands, the size that the post office uses, to make an ounce.

If you have a large item to weigh and you're having difficulty keeping it on the scale, just place it on a piece of cardboard or in a box and then subtract the weight of the cardboard or box.

Start shopping for your scale. It will help you lighten your load and have more fun every time you hike.

Chapter 20: Hiking Light – Caring For Your Ultralight Performance Clothing and Gear

High performance backpacking clothing and gear can be a substantial investment. Since most of the fabrics are synthetics, it's good to know how to clean them and make them last.

The most obvious instructions are those on the care tag. If you are a super fanatic and remove tags to save weight, at least save the tags and write a brief note as to what tag goes with each piece of clothing.

It's a pretty safe bet that many hikers throw their hiking gear in with the rest of the wash. Depending on your settings and detergents, this might work or it might damage the performance qualities of the fabric.

If you keep your apparel clean it will last longer and perform better. When you do have to wash gear, remember that the washing process is stressful to any fabric, so it's better to hand wash. This doesn't have to be a long, tedious job. Soaking for a few minutes is usually more beneficial than having your clothes twist back and forth in a washing machine. Very few hiking garments should be dry cleaned. It's always best to avoid those chemicals anyway. Harsh detergents and dry cleaning chemicals can harm your clothing's performance coatings.

When cleaning your synthetic fabrics, use a minimum of laundry products. Their additives can clog fabric, reducing the wicking power of the fiber. Never use scented detergents, bleach, dryer sheets, or fabric softeners. You can turn garments inside out to avoid snags. Always wash your synthetic clothing separate from cotton garments. This keeps cotton fibers out of the fabric and greatly reduces drying time. Wash on a cold, gentle setting. Never get your synthetic gear too hot. Cool tumble dry, or better yet, hang to dry – that's what they are made to do. They'll avoid gradual shrinkage, and they'll look better, too.

Remember that not all synthetics are alike. Some can go in a washing machine. Some can be tumble dried, while others should never go in the dryer. Some garments can have their performance qualities restored by using commercially purchased products suited to the gear.

For cleaning Gore-Tex and other breathable synthetic outer shell clothing, follow the instructions on the label. These can usually be machine-washed in cold water using a special Gore-Tex cleaner or gentle powder soap that contains no bleach.

Polar fleece can be cleaned in the washing machine using cold to warm water. Turn it inside out to avoid pilling. Don't wash with other items because the fleece will attract fluff and leave fluff on other non-fleece clothing. It can be tumble dried. Pilling gets worse with each wash.

You can wash your down jacket much the same as you care for your down sleeping bag. Extend the life of your jacket by keeping it as clean as possible so you don't have to wash it too often. Wear clean clothing when possible to protect against trail dirt, body oils, sweat, and lotions that can harm the down.

Clean small stains and spills with a damp cloth as they occur to avoid repeated washings. You can spot treat stains with soap or cleaning solvent. Use solvents to remove tar or tree sap. Move the down away from the spot you're treating.

Always follow all the manufacturer's cleaning instructions. By following a few simple guidelines you can have a clean jacket and restore its loft.

Never dry clean your jacket since the solvents can strip away natural oils contained in the down.

Never use a top-loading or agitator machine because they can damage the baffle construction. If you do use a washing machine make sure it's a front loader. Use cold and gentle cycles.

For all down jackets it's safest to wash by hand in a sink or tub. You can use mild soaps such as Ivory Flakes or Woolite, but not detergents. Do not add bleach or fabric softener. You can also use one of the down cleaners that are made especially for down products.

Fill your sink or tub with warm water. Use only the amount of down cleaner recommended. Rinsing it all out is one of your most important objectives. Gently knead the soapy water through the jacket. Carefully scrub the dirtiest places. You can apply the cleaner directly to the worst areas. Don't expect the down cleaner to remove every stain. Let the jacket soak for 15 minutes to an hour. It may be necessary to change the soapy water more than once, but don't overdo it.

You need to rinse with clear water several times to make sure you get the soap out. Some manufacturers tell you to rinse 3 or more times, but even using small amounts of soap, you may want to rinse 10 times or more. Getting all of the soap out is critical. Empty the sink or tub with each rinse and let the water drain out. The thing you want to be really careful about is pulling or lifting your jacket went it is wet and at its heaviest. The stitching or interior baffles can be ripped loose. One trick you can use is to put the jacket in a mesh bag and carefully and slowly lifting that bag to knead the soap in and to rinse the water out. Press on your jacket to remove the water after each rinse, but don't ring out the water. If you wash your jacket in a front loading washer, run it through a second cycle without soap to get all the suds out.

A washing machine that will allow you to use the last spin cycle will remove a lot of water and save dryer time. You can carefully place the jacket in a top loader for this part. When you move the jacket from tub to washer, you can gently roll it into a ball or carry it in a mesh bag.

Some manufacturers warn against home dryers, but if you have a low heat setting, no hot spots, and no sharp areas inside the dryer that could damage the shell fabric, you should be fine. Tumble dry on the lowest heat setting. This may take two hours or more. During washing the down collects in clumps. As you dry, check for lumps and redistribute with gentle massaging and more drying time.

When you return home from a hike, letting your sleeping bag and other gear dry out is one of the most important things to do. Place your sleeping bag and tent in a warm area away from kids and pets. Letting your gear dry thoroughly is far easier than removing that mildew smell later.

Your lightweight running shoes are efficient and comfortable for ultralight hiking, and they're easy to clean after a dusty hike. Just let them soak in a sink or small tub. You can quickly scrub them with a brush, rinse them, and let them dry with the help of a fan.

Take care of your ultralight performance clothing and gear and they will continue to take care of you.

Chapter 21: Get Total Protection from Mosquitoes and Other Pests – Or Fight the Bite and Flick the Tick.

Nothing can ruin your hike or any outdoor adventure like mosquitoes. They can be the difference between a great time and misery. Since you can't swat them all, you need to know how to keep them away.

Fortunately, there's a solution that can be nearly 100% effective. The mosquitoes will still be there, but they won't bite if you use a combination of a DEET-based repellent on exposed skin and a permethrin treatment on your clothing.

That's the short story. But it's also helpful to know the stimuli that attract mosquitoes. You should know how to use each product correctly. And you probably want to know the effects of placing these products on your skin and in the environment.

Only female mosquitoes bite. They require a blood meal to produce eggs. They feed every 3 to 4 days and consume more than their own body weight in blood. Different species feed at different times of the day. There are over 175 species of mosquitoes in the United States. Some prefer animals. Some prefer human blood. Mosquitoes require an environment of standing water to develop.

The lifespan of mosquitoes varies from species to species. Males usually live for only about 2 weeks. Females can survive for 6 weeks to about 5 months, depending on the species, conditions, and time of year.

When a mosquito bites, she injects a small amount of saliva to make penetration easier and prevent the blood from quickly clotting. The welt or bump that appears after the bite is a mild allergic reaction to the saliva. When your body senses the intrusion of the mosquito saliva, it releases its own chemicals, or histamines, to fight off the attack. These histamines cause the bite to itch. Of course, some people are more allergic than others. You may also be more allergic to some species than others. You should avoid scratching these welts to prevent bacteria that may by under your fingernails from causing an infection.

Mosquitoes use visual, thermal, and olfactory stimuli to locate you. Olfactory signals, or sense of smell, are probably the most important. Mosquitoes can smell their prey from over 40 yards away. Larger people give off more carbon dioxide, which is probably why mosquitoes prefer adults over children. Mosquitoes prefer men over women, probably for the same reason.

Day feeders may notice your movement or dark clothing if you're close. Mosquitoes follow your scent and can see you at about 10 yards. They don't see well, and at 10 yards they have trouble distinguishing you from other objects of similar size and shape. Wear light, muted colors. Wear long sleeves and pants when possible, and clothing with tight weaves.

Our bodies release hundreds of compounds, but carbon dioxide, lactic acid, and uric acid are the best-studied mosquito attractors. Mosquitoes can detect lactic acid with the chemoreceptors on their antennae. These are the receptors that may be confused by DEET-based and picaridin repellents.

When mosquitoes get really close, your skin temperature and sweat are attractive to mosquitoes. Mosquitoes are attracted to heat so larger people are more of a target because of the additional heat as well as carbon dioxide and other compounds. Dark clothing holds more heat, so mosquitoes may be attracted to dark clothing because of the increased heat as well as the visual appeal. There seem to be other attractants in some people's sweat that attract mosquitoes. Researchers are busy trying to isolate the chemicals in the sweat of people who don't attract mosquitoes in order to make repellents.

Mosquitoes are sometimes attracted to fragrances, especially floral ones, so watch what soaps, lotions, deodorants, and hair care products you use. Use products that are unscented and leave all perfumes home.

If you feel picked on by mosquitoes, you may have good reason. One in ten people are very attractive to mosquitoes. Genetics are responsible for most of our susceptibility to mosquito bites. People with high concentrations of cholesterol on their skin attract mosquitoes. This doesn't mean your cholesterol levels are high. It means these people may be more efficient at processing cholesterol and the mosquitoes are attracted to the byproducts remaining on the person's skin.

Since mosquitoes prefer stagnant water, avoid ponds and lakes when possible and head for streams. Better yet, in mosquito areas take your water from streams and rest, cook, or camp away from water. This has advantages beyond avoiding mosquitoes. By avoiding heavily-camped areas, you'll also have a more natural wilderness experience, and you'll be more likely to avoid bears looking for your food.

Mosquitoes can be found at high altitudes. They're usually not active below 55 degrees Fahrenheit. Mosquitoes don't like moving air, so camping on a windy ridge can be a good idea. Mosquito populations and conditions can change drastically in just a few miles. You might get some good tips on where to hike and camp overnight from other hikers.

The most popular mosquito repellent continues to be DEET (N, N-diethyl-meta-toluamide) and for good reason. It's been tested for many years and in many studies it's been proven to be the most effective chemical repellent available. DEET was developed by the U.S. Department of Agriculture and was patented by the U.S. Army in 1946. It was registered for use by the public in 1957. About 38% of the U.S. population uses a DEET product every year. About 230 products containing DEET are registered with the Environmental Protection Agency. In addition to mosquitoes, it is effective in repelling biting flies, chiggers, fleas, and ticks. After completing a comprehensive re-assessment of DEET in 1998 the EPA concluded that insect repellents containing DEET do not present a health concern as long as consumers follow label instructions and take proper precautions. The bottom line is that DEET has a great safety record, and most problems reported are due to gross overuse.

All DEET product labels tell the consumer to: *Read and follow all directions and precautions on the label
*Do not apply over cuts, wounds, or irritated skin
*Do not apply to hands or near eyes and mouths of young children
*Do not allow young children to apply this product
*Use just enough repellent to cover exposed skin and/or clothing (More on clothing treatment with permethrin later, which will reduce the need for DEET clothing application to zero)
*Do not use under clothing (As above, there is no need to apply under clothing with the use of permethrin on clothing)
*Avoid over-application of this product
*After returning indoors, wash treated skin with soap and water (For hikers, it's best to wash it off regularly so there's no buildup)

*Wash treated clothing before wearing again (No need to use DEET. Permethrin is easier to use on clothing and very effective)
*Use of this product may cause skin reactions in rare cases.
For aerosol and pump sprays users are cautioned not to spray in enclosed areas and not to spray directly onto face. Spray on hands first.

DEET is approved for use on children over two months old with no restriction on the percentage of DEET. The American Academy of Pediatrics recommends the lowest concentration of DEET that's effective for the amount of time you'll be outdoors and to avoid repeated applications on children.

Most experts recommend concentrations of 20% to 35% DEET for adults over 12 years of age and concentrations of 10% or less for children under 12. The U.S. military uses the Ultrathon brand which is 34.34% DEET. It has been shown to be 99% effective for more than 8 hours and more than 95% effective for up to 12 hours depending on the conditions. It is dispersed in a polymer giving it a time-release action. The Centers for Disease Control reported:
*A product containing 23.8% DEET provided an average of 5 hours of protection from mosquito bites
*A product containing 20% DEET provided almost 4 hours of protection
*A product with 6.65% DEET provided almost 2 hours of protection
*Two products with 4.75% DEET were both able to provide roughly 1 ½ hours of protection

For complete protection there is not much of an advantage to increasing the concentration of DEET above 35%, and above 50% there is not an equivalent increase in duration of coverage. The brands with time-release formulas make it even more advantageous to use lower concentrations that are effective longer.

Length of protection from mosquito and other bites varies with the amount of active ingredient, temperature, perspiration or water exposure, and whether the repellent is rubbed off. In general, a higher percentage of DEET will last longer, although it varies between different products and brands. Different species of mosquitoes vary in reaction to the same repellent.

DEET's most significant benefit is its ability to repel potentially disease-carrying insects and ticks. The Centers for Disease Control receives nearly 10,000 reports of Lyme disease (transmitted by deer ticks) and 1,000 reports of encephalitis, including West Nile (transmitted by mosquitoes) annually. Both of these diseases can cause serious health problems or even death in the case of encephalitis. Other diseases that DEET helps to prevent by repelling the host carriers are Rocky Mountain spotted fever, human granulocytic ehrlichiosis (HE), malaria, yellow fever, and dengue fever.

You should be careful when applying DEET because it can be damaging to plastics like eyeglass frames, watch crystals, leather, painted or varnished surfaces, rayon, spandex, and some other synthetic fabrics.

DEET can be applied to natural fibers and backpacking equipment made of nylon such as mesh netting, packs, tents, and sleeping bags. But it is easier, more effective, and longer-lasting to treat them with permethrin.

DEET can be applied with sunscreen, but there are some concerns and guidelines. Since the sunscreen will probably have to be applied more often, it's best not to use a combination product, especially on children. The sunscreen protection level can be decreased by one third. The DEET can also be compromised, and possibly absorbed into the skin at a higher rate. Sunscreens are meant to work below the skin and repellents are designed to be an olfactory barrier on top of the skin. It's best to apply the sunscreen first and wait a few minutes before applying the repellent.

Picaridin, or KBR3023, or Bayrepel outside the U.S. (trademark of Bayer AG), is recognized by the EPA as an effective alternative to DEET. Picaridin's protection and duration are similar to DEET, and it has some advantages. It is colorless and nearly odorless, with a light, clean feel. It has low toxicity. It has been used worldwide and especially in Europe and Australia since 1998. It was approved by the EPA for use in the United States in 2005. The American Academy of Pediatrics has not yet made a specific recommendation for the use of picaridin on children.

Picaridin is effective in repelling biting flies, mosquitoes, chiggers, ticks, and fleas. It is environmentally friendly and will not harm spandex, rayon, or other synthetic clothing. It doesn't damage sealants, coatings, or plastics such as watch crystals or eyeglass frames. Picaridin doesn't need to be washed off after returning indoors. It is marketed in the U.S. under the brand name Cutter Advanced.

For areas where biting flies are a problem and are resistant to DEET, Sawyer Broad Spectrum includes 16% DEET and a separate fly repellent R-326 which repels flies, gnats, and no-see-ums. It is available in pump spray without alcohol.

Oil of lemon eucalyptus (p-menthane 3,8-diol or PMD), a plant-based repellent is also registered with the EPA and is available under the Repel brand name. It provides protection similar to repellents with low concentrations of DEET. Labels on these products warn that they are not to be used by children under 3 years. No other plant-derived repellents, including citronella, approach the effectiveness and duration of DEET or picaridin.

Avon Skin-So-Soft (IR3535) is recognized by the EPA as a repellent, but it is much less effective than DEET and is not long-lasting.

There is no scientific evidence that other methods such as taking large doses of vitamin B or eating garlic are effective in repelling mosquitoes.

As mentioned, loose-fitting clothing with tight-weave fabrics are great, but determined mosquitoes often find the parts of your body that are pressed tightly against the clothing. The greatest addition to fighting the mosquito war in recent years is permethrin. It is a synthetic chemical similar to the natural insecticide pyrethrum which comes from the chrysanthemum plant. Permethrin is approved by the EPA to spray on clothing, shoes, netting, and camping gear. When you use it on your clothing in combination with a DEET-based product on your skin you get complete protection from mosquitoes and many other pests. The U.S. Department of Defense uses this system. In tests conducted by the U.S. Army and Air Force, uniforms treated with a light .05% solution of permethrin gave 97.7% protection from mosquitoes. When used in combination with a 33% solution of DEET there was 99.9% protection over an 8 hour period. This test was conducted in an environment where unprotected people received 1,188 bites per hour.

DEET confuses insects. Permethrin kills insects or knocks them down when it contacts them or when they eat it. It has repellent effects also. It is effective against mosquitoes, ticks, flies, fleas, chiggers, mites, bedbugs, millipedes, centipedes, earwigs, spiders, ants, fire ants, and over 100 other insects.

To treat clothing, moisten both sides completely and allow it to dry. Apply it in a well-ventilated area. Permethrin is harmless to natural and synthetic fibers, even silk. It won't harm Gortex. Permethrin is colorless, odorless, and non-staining. It doesn't affect the feel of the clothing or gear. After it dries and bonds to the fabric in your clothing or gear it has exceptional resistance to sunlight, water, and heat. It bonds so tightly to the fabric that any chance for absorption through your skin is minimal. If any permethrin gets on your skin accidentally, it is rapidly inactivated and very poorly absorbed (less than 2%) and quickly inactivated by your skin and liver and excreted. Based on animal testing it is not expected to accumulate in the body.

No systemic effects have been reported. In EPA and FDA tests it was uncommon to have any skin irritation from permethrin. It doesn't bond to skin as it does to fabric, and when it touches your skin it is deactivated in about 20 minutes. When applied to clothing by aerosol or trigger spray in the .05% concentration it will last up to two weeks or two launderings. Clothing sprayed or soaked in heavier concentrations will last even longer.

Hikers have always had the option of putting DEET on their clothing or gear, but it feels as though they're applying something quite greasy when they do this. The DEET may feel enough like a lotion for use on your body, but adding it to gear hasn't seemed practical because of the oily feel and because it doesn't have a lasting effect. Permethrin doesn't change the look or feel of the gear. Treating your tent netting and the tent in general has the obvious advantage of keeping pests farther from you. A permethrin treatment at the door of the tent can keep many varieties of crawling bugs away from you. If your pack is treated, you don't have to worry as much where you place it at rest stops and around camp.

Studies report that permethrin is environmentally safe. It readily breaks down in most soils. Permethrin is tightly bound by soils, so there is very little leaching. It is nearly insoluble in water, and is not expected to leach or to contaminate groundwater. Permethrin degrades rapidly in water, although it can persist in sediments. Before it breaks down it is toxic to fish, so you should not use it near a water source or a drain. Permethrin is practically non-toxic to birds, but is very toxic to bees. There are some permethrin sprays specifically for dogs. These should never be used on cats because of their grooming habits and because they are much more susceptible to toxicity from permethrin.

If you receive mosquito bites there are a number of things you can try to reduce the itching and discomfort. Wash with soap and water and keep the area clean to avoid infection. A cool compress may be difficult when hiking, but if you're near water or snow pack it can sometimes bring relief. Try a paste of baking soda and water, using just enough water to make the paste sticky, and apply it to the bite. Use calamine lotion or a topical anesthetic containing pramoxine, such as Caladryl. Take an antihistamine, one that is not very sedating to you. Topical steroid creams can be helpful. An anti-inflammatory drug such as ibuprofen or naproxen may reduce swelling. Ibuprofen is probably already in your arsenal for muscle aches. Other anti-inflammatory choices are oral evening primrose oil and papaverine. Try a 1-percent hydrocortisone cream. There are many home remedies that are not scientifically proven, but are interesting. Choices include applying soap, deodorant, toothpaste, rubbing alcohol, Visine, Murine, or vinegar.

With a little precaution, you can have total protection from mosquitoes and ticks. Spray your clothing and gear ahead of time with permethrin and when you hike cover your exposed skin with a DEET-based repellent.

Chapter 22: Hiking light – Boy Scout Ultralight Hiking is More Fun for Leaders and Scouts

That's not an oxymoron. Boy Scout lightweight hiking is not only possible, it's the only way to go.

Travel back with me to 1972. I was an inexperienced 24-year old scoutmaster. I knew I wanted to go on a 50-mile hike with the boys, but I was worried about having to take care of their complaints and aching backs. I wanted the boys to have fun, and I wanted to have fun. I didn't have anyone tell me about lightweight backpacking. Common sense just told me it would be a lot easier if packs were light and simple.

We targeted a beautiful 56-mile stretch through the Three Sisters Wilderness area in central Oregon. Then we did the most important part – we started planning early. I made moms and dads come to required meetings. Moms are critical because not only do they do much of the purchasing of equipment, they're also the ones who almost always load too much gear in juniors back to "make sure he has everything to be safe." Of course, in an effort to keep their son safe, they insure that he'll have a horrible time carrying his pack.

I told parents what was required, and just as important, what was required to leave home. Parents needed to visualize their son not lounging beside a lake for five days, but walking 10 miles a day for five days. Once this picture gets clear in their minds, they buy into the need for lightweight gear. We talked about shelter, sleeping bags, clothes, food, and all the usual things.

After careful planning, we had that other crucial meeting, the pack check. That's the meeting where leaders check the fully-loaded pack a few days before the hike. That gives some extra time for necessary changes. Our pack check meeting went well. We weighed the packs on a bathroom scale and they ranged from 19 to 26 pounds, a fantastic effort for 1972.

Shelter was simple, and less than perfect. Most of the boys slept under black plastic. Most of the sleeping bags were U.S. Forest Service fire fighter sleeping bags. These turned out to be much less than perfect, but everyone lived. The food was good, but most of all, the packs were light. Because we packed light, we arrived in camp early each day so we could enjoy more time relaxing.

The checklist in the scout handbook should work fine for informing parents and boys what to pack. There are a couple of things that should be checked closely at the pack check. The first is rain gear. The importance is obvious, but it's scary how many people think a windbreaker will work just fine. An inexpensive, urethane-coated nylon jacket and pants would be far better than a windbreaker that doesn't protect against rain. Another important item to check is food. Parents might not understand the importance of almost doubling the calorie intake for their sons on a 50-mile hike. For meal planning, it's best to let mom pack plenty, as long as it's light, healthy, calorie-dense food. Make sure to have a presentation on lightweight backpacking foods well in advance of the hike.

Sadly, many Boy Scout troops today don't catch the vision of ultralight backpacking. Boys trudge through their 50 miles with heavy backpacks then swear they'll never hike again. And they live up to that promise. Large numbers of boys who should fall in love with backpacking learn to dislike it.

If you're already an expert in lightweight backpacking, volunteer to give ultralight presentations for local troops. Or, ask around and find an expert. The presentation doesn't have to be fancy. Just show the scouts and leaders a fully-loaded backpack that's ready for 50 miles and weighs only 20 pounds. Go through the gear piece by piece, starting will the bigger items. Scouts and the leaders who will be going on the hike will see the advantages. Show them how they can share the weight of some items such as tents. When a boy shares the weight of a four-pound tent with a buddy, he immediately reduces his pack weight by two full pounds.

The troop I hiked with in 1972 was a blue collar group of boys. With early planning, you can exchange ideas on inexpensive gear. Some of it can be found in discount department stores. Start exchanging information within the troop well in advance of the hike so the boys get a good mix of quality and good prices on their gear.

The Boy Scout motto of "Be Prepared" is perfect for lightweight backpacking. It doesn't mean be prepared by taking lots of heavy gear. It means be prepared with a well-equipped lightweight backpack. Boy Scout lightweight hiking is more fun for both leaders and scouts.

Chapter 23: How To Care For And Clean Your Down Sleeping Bag

Your down sleeping bag is an important investment in lightweight backpacking. It's good to know that with proper care it can last a long, long time.

To extend the life of your bag, never store it in its stuff sack. Long periods of compression will cause the bag to lose its loft. Keep it loosely stored in a dry place in a large cotton bag. Or hang it in a closet or store it flat. Don't ever store your bag in something that is watertight. This can result in condensation and mildew. Avoid excessive heat that can evaporate the natural oils in down. Make sure your bag is completely dry after each trip before you store it.

Airing out your bag on each day of your backpacking trip will help keep it lofted and dry. Turn inside out and use the sun and breeze if necessary. Sleeping bags can be stuffed over and over without damage. Not using a compression stuff sack or even the smallest stuff sack possible may help you reduce the stress on your bag when stuffing it. Never roll your sleeping bag. Stuffing it is easier on the down and fabric. When you stuff your bag, start with the foot first to let the air escape more easily. Push the bag firmly into the bottom of the stuff sack and stuff with an even motion. This puts less stress on the stitching. As you stuff, if you press against your thigh or the ground instead of just holding the stuff sack out in front of you, you'll put less stress on the bag and the stitching of the stuff sack.

As soon as you get to camp each evening, remove the bag from its stuff sack to allow it to air out and loft. Use an even, gentle motion to remove it from its stuff sack. Never yank it and stress its seams. Keep your bag out of sunlight unless you're drying it, since the UV rays slowly degrade the fabric.

Extend the life of your bag by keeping it as clean as possible so you don't have to wash it too often. Never lay your bag directly on the ground. If you're not in a tent, use a ground cloth. Keep your sleeping pad and tent floor clean. Wear clean clothing to bed. This protects against trail dirt, body oils, sweat, and lotions that can harm the down.

If clothing is too restrictive, or heavy, consider using a sleeping bag liner. They are made of cotton, polyester, or silk and can weigh as little as four ounces. They also add a few degrees of warmth to your bag. After each trip, just wash and you're ready for your next adventure.

Clean small stains and spills with a damp cloth as they occur to avoid repeated washings. You can spot treat stains with soap or cleaning solvent. Use solvents to remove tar or tree sap. Move the down away from the spot you're treating.

When your sleeping bag is ready to clean because it has too much odor, too much dirt, or has lost its loft, always follow all the manufacturer's instructions. By following a few simple guidelines you can have a clean bag and restore its loft.

Never dry clean your bag since the solvents can strip away natural oils contained in the down. Dry cleaning fluids remain in the bag, and dry cleaning is not effective in cleaning the down.

It's probable that your bag is dirtier on the inside than outside, so turn the bag inside out before washing. Zip up all the zippers. Never use a top-loading or agitator machine because they can damage the baffle construction. If you do use a washing machine make sure it's a front loader. Bags with tricot baffles are stronger than bags with no-see-um netting baffles. Use cold and gentle cycles.

For all down sleeping bags it's safest to wash by hand in a tub or bathtub. You can use mild soaps such as Ivory Flakes or Woolite, but not detergents. Do not add bleach or fabric softener. Since you've invested so much money in your bag and you'll invest so much time in washing it, it's best to use one of the down cleaners that are made especially for down products.

Fill the tub with warm water. Use only the amount of down cleaner recommended. Rinsing it all out is one of your most important objectives. You can put your bag in the water and get it totally wet while it's in its stuff sack. This way the air has already been forced out of the bag and you won't have to fight air-filled baffles trying to float to the surface. Pull the bag from the sack and gently knead the soapy water through the bag. Carefully scrub the dirtiest places such as the head and foot. You can apply the cleaner directly to the worst areas. Don't expect the down cleaner to remove every stain. Let the bag soak for 15 minutes to an hour. It may be necessary to change the soapy water more than once, but don't overdo it. You need to rinse with clear water several times to make sure you get the soap out. Some manufacturers tell you to rinse 3 or more times, but even using small amounts of soap, I've rinsed 10 times or more. Getting all of the soap out is critical. Empty the tub with each rinse and let the water drain out. The thing you want to be really careful about is pulling or lifting your bag went it's wet and at its heaviest. The stitching or interior baffles can be ripped loose.

One trick I like to use is putting the sleeping bag in a large mesh bag and carefully and slowly lifting that bag to knead the soap in and to rinse the water out. Press on your bag to remove the water after each rinse, but don't ring out the water. If you wash your bag in a front loading washer, run it through a second cycle without soap to get all the suds out.

After the last rinsing, carefully move your bag to the washing machine. A washing machine that will allow you to use the last spin cycle will remove a lot of water and save dryer time. You can carefully place the bag in a top loader for this part. When you move the bag from tub to washer, you can gently roll it into a ball or carry it in a mesh bag. Other techniques include putting it in a large pillowcase or rolling it into a plastic clothesbasket.

Some manufacturers warn against home dryers, but if you have a low heat setting, no hot spots, and no sharp areas inside the dryer that could damage the shell fabric, you should be fine. Tumble dry on the lowest heat setting. This may take two to four hours. During washing the down collects in clumps. As you dry, check for lumps and redistribute with gentle massaging and more drying time. It may be helpful to add two or three clean tennis balls to break up the down.

Here's a recap of the basics:

- Wash in bathtub or front loading washing machine
- Use down cleaner
- Don't pull and stress the bag when wet
- Rinse thoroughly
- Dry completely

With proper care and washing, you can enjoy many years of comfort in your sleeping bag.

Chapter 24: How To Measure Your Torso

Since your torso length is more important for pack fitting than your height, you need to know how to accurately measure your torso.

A tall person can have a short torso and a short person can have a long torso. To measure your torso, you'll need a soft tape measure, the kind that tailors use, and the help of a friend.

Stand straight with your legs about shoulder width apart. Start measuring at the seventh vertebra, the most prominent bone at the base of your neck. If you bend your head forward it may be found more easily. If you bend your head backwards, you can find it in the crease of the neck.

Measure from that point down the spine following the curve of your back along the way. To determine the bottom point of the measurement, find your iliac crests. These are the tops of your hip bones on each side. With your index fingers on the top of your hip bones, point your thumbs back and level. The point between your thumbs is the bottom of your measurement. The distance between these two points is your torso length.

That's it! Now that you have an accurate measure of your torso, chip it in stone somewhere near where you keep all your camping gear. It will come in handy if you buy a new pack.

In general, less than 18 inches is a small torso, 18 to 20 inches is a medium torso, and over 20 inches is a large torso.

Chapter 25: Lightweight Backpacking Gear Checklist

Here's a simple list, with some optional items, that you can refer to before each trip:

Pack, Tent, Sleeping Gear

- Pack
- Tent/shelter
- Sleeping bag (liner)
- Sleeping pad
- Ground cloth
- Pillow

Kitchen

- Food
- Stove
- Fuel
- Matches
- Mess kit
- Cup
- Spoon
- Knife
- Water bottle
- Water purification tablets/filter
- Scouring pad
- Garbage bag
- Towel)1 kitchen/1 body care?)

Toiletries, body care

- First aid kit, moleskin
- Insect repellent
- Biodegradable soap, hand sanitizer
- Sunscreen
- Lip protection
- Toilet paper
- Toothbrush
- Toothpaste/powder
- Dental floss (for repairs, too)
- Mirror (for signaling, too)
- Deodorant
- Medications

Clothing	Emergency, other, & optional
• Rain gear • Shirt(s) • Pants • Belt • Shorts • Socks • Shoes • Underwear • Hat or visor • Gloves • Gators	• Flashlight/batteries/bulb • Map • Compass • Sunglasses • Fire starter • Emergency blanket • Whistle • Cord • Rubber bands/tape/needle/thread • Pencil or pen/paper • ID, cash, credit card • Car keys • Camera & film • Hiking poles • Umbrella • Mosquito head net • Reading glasses • Reading material

Chapter 26: Ultralight backpacking with kids – With a little planning, it's fun and easy

Once you reduce your own pack weight to a minimum, taking the kids along is fairly easy.

Compared to the drudgery of packing up a ton a gear for car camping, backpacking with children is simple. Each child can carry a small pack with their clothes and a little food. This makes them feel independent and grown up. And since they have a ton of natural energy, you might as well let them carry their share.

When are they old enough to backpack? In our family, it was as soon as they were potty-trained. As long as you're realistic about the terrain and mileage they can cover, you should all enjoy it. There are three main rules to remember when taking the kids – keep it simple, keep it simple, and keep it simple.

For their first few times backpacking, I always tried to pick really scenic areas that weren't very many miles from the trailhead. You can enjoy the beauty without making it a physical strain.

I took my old external frame pack and there was plenty of room for a couple of extra sleeping bags. If you can make a monetary investment in some quality sleeping bags, it simplifies everything. A couple of extra two-pound bags doesn't take up much space in your pack or add much weight. The extra weight of the larger pack wasn't bad because I had already reduced the overall load. With good sleeping bags you have the comforting feeling of knowing the kids will be warm at night.

The next important task is to keep them warm and dry during the day. Don't fall into the usual trap of overkill and bring too many clothes. But make sure you have gear that keeps them warm. Do the same as you do for your gear – plan ahead. You can buy inexpensive, light clothing at regular department stores, and even thrift stores. Let the kids know early that this isn't a fashion show.

Remember that they need rain gear, too. Windbreakers or cotton coats don't work when it rains. But inexpensive, coated nylon will keep them dry. And if the weather forecast calls for a lot of rain, it may be best to postpone your trip. Kids will love backpacking more if their first few experiences are in good weather. Remember to take their hat for sun and rain protection.

For footwear, follow the keep it simple rule. Let them take what's comfortable. That probably means taking what they play in around the house. But plan ahead. If their casual shoes are flat-sole, court-type shoes, you may need to buy something that's a little more of an all-terrain shoe. Remember they're growing fast, and don't take anything that's getting too small. Hiking could be torture in tight shoes.

Take extra socks. Water seems to be a magnet for kids. Stepping in a stream won't be a such a nuisance if the extra socks are ready.

Kids won't remember to put on the sunscreen, so you'll need to remember for them. They will tell you if the mosquitoes are bothering them. DEET in small amounts should be safe, but if you'd rather not use DEET at all, you can substitute Cutter Advanced with Picaridin.

Kids will remember whether you kept them well fed, but your normal meal planning should be fine. It all tastes great outdoors. You'll be a hero if you take some treats, too. Let them test some trail mixes before you go. Take some M & Ms, fruit leather, and beef jerky. That's part of the fun.

Kids don't need much extra gear. After you have their clothing, you can add things like their toothbrush and a spoon and plate. One thing they'll appreciate is their own flashlight. They can rummage around at night for anything they need, and the flashlight works wonders at keeping the boogeyman away.

Take a little time to casually teach them the tricks of camping such as cooking and setting up the tent. You'll be surprised how quickly they learn.

The very nature of ultralight backpacking is perfect for kids. Plan ahead. Keep it simple. Keep it fun. You love the outdoors, and they will, too, if they're comfortable. Don't forget the camera. Let them take some of the pictures, too. You'll have some great memories.

Chapter 27: Your Ultralight Backpacking First Aid Kit – Include a Lot in a Two-Ounce First Aid Kit

When you tell a friend or family member you're going on an overnight hike, one of the first pieces of friendly advice you might hear is, "Be sure to take lots of first aid equipment."

Of course, you need to be ready for emergencies, but an ultralight hiker can do that with just a few ounces of gear. Remind your friends, and yourself, that you're more likely to be injured driving to the trailhead.

One of the lightest first aid kits available is the little yellow one called a "Pack 1" that weighs only 1.1 ounces and includes 23 items. This is a good start. It includes a first aid guide with a surprising amount of information, a needle, 10 small bandages, 3 larger bandages, a knuckle bandage, 2 adhesive strips (4"), a gauze pad, an alcohol pad, an antiseptic pad, a small piece of moleskin, and a moist travel towel.

The plastic it comes in weighs .4 ounces, so you can throw that away and put the contents of the kit and some of your own additional items in a zip lock that weighs almost nothing. A couple of extra sterile gauze pads, such as the common 2" x 3" size are a good addition. Butterfly bandages are a must. Pick a couple of sizes. Add a few cotton swabs, and remember that the style with hollow tubes are the lightest. A partial role of the small, surgical tape is light and can bandage large wounds. Extra moleskin, or a similar product, is necessary for many hikers. Wide athletic tape can be applied before you start hiking to keep blisters from forming. If you switch from the needle in most first aid kits to a few small safety pins, you'll have some additional repair items without adding any weight. Since the points of the safety pins are tucked away, you avoid the possibility of the needle poking a hole in you or your equipment. Triple antibiotic ointment packets are good to add. They can help a wound heal, and they can greatly reduce the discomfort of jock itch.

It's difficult to say what an ultralight first aid kit should weigh because some of your first aid items are also normal pieces of gear. Some of these can include: aspirin, ibuprofen, antacids, anti-diarrhea tablets, sunscreen, lip protection, biodegradable soap, knife, toothpaste (a mild antiseptic), matches, benadryl or benadryl tablets, water purification gear, and insect repellent. Your extra cord, tooth floss, and duct tape can be first aid items or used for repairs. Your cleanest clothing or large ziplock can be used to stop bleeding. Even your hat can be thought of as a piece of first aid gear that keeps you from getting sunburned. Your signal mirror and whistle are emergency items that can help you avoid the need for your first aid kit. Your paper and pen can be used to leave emergency notes on your physical condition and changed plans such as a new exit route.

You can improvise a lot of first aid equipment. To make a cold pack, use water and a bandana or towel. If you need heat, you have your cooking gear.

Your best first aid equipment, planning and knowledge, are better than ultralight. They're weightless. Effectively planning how to stay warm and dry avoids the common wilderness emergency of hypothermia. Knowing emergency exit routes can be helpful. Knowing how to apply a tourniquet or slow blood flow by applying pressure to the correct points is invaluable. Keep in mind that handling your stove and hot water are times you need to be alert, especially when you're tired. On unsteady ground, plan how you might fall to your hands and knees to avoid an ankle sprain. Simply making sure your hands are washed with water and a little biodegradable soap, especially after defecation, will help you avoid some of the most common physical ailments that backpackers encounter. Training hikes will help you avoid many aches and pains.

Carry a first aid kit that fits your style, skill level, and the conditions you'll encounter. With just a little planning, you can reduce the weight of your first aid kit and make it more effective.

Chapter 28: Wilderness First Aid in Emergencies

Be ready for emergencies with these first aid procedures. Feel free to copy these instructions and make them part of your first aid kit.

Severe bleeding
Act quickly. Have the victim lie down. Using a clean cloth, apply direct pressure to wound. Apply cover bandage. If needed, apply second bandage and increase direct pressure. Elevate the wound above heart level. If bleeding continues, apply pressure to appropriate pressure point as well as directly to wound. Pressure points include inside of upper arm, inside arm below elbow, inside and outside of wrist, back of knee joint, crease of groin, and top of foot. Release pressure point once bleeding is controlled. Reapply pressure at pressure point if bleeding recurs. Use tourniquet only as an absolute last resort in a life-threatening situation. Treat for shock. Keep the wound clean.

Breathing stopped
Place victim on back, head tilted backward. Using 2 fingers, lift chin, keeping jaw supported and mouth open. Adult/Child: Pinch nose shut. Place mouth over victim's mouth. Adults: Repeat 1 breath every 5 seconds. Child: Repeat 1 breath every 3 seconds. Infant: Place mouth over nose and mouth. Give 2 slow breaths, watching for chest to rise. Remove mouth between each breath. Repeat breath every 3 seconds.

Adult/Child choking (1 yr. +)
Conscious: Stand behind victim. Place fist just above navel. Grasp fist with other hand and give quick upward thrusts until object comes out or victim is unconscious.
Unconscious: Lay victim on back. 1) Look in mouth for foreign object. 2) IF seen, sweep finger down inside cheek with hooking motion. 3) Give 2 breaths for adults, 1 for children. IF air won't go in, re-tilt head, try again. IF air still won't go in, place heel of hand just above bottom of breast bone. Place other hand on top. Give 15 chest compressions for adults, 5 for children. Repeat all steps until air goes in.

Hypothermia
Hypothermia is defined as having an internal body temperature of under 95 F. Symptoms include shivering, difficult or slurred speech, slow breathing, cold skin, loss of coordination, fatigue, and lethargy. Treatment: Monitor breathing. Get victim out of cold, indoors if possible. Protect from wind, cover head, insulate from cold ground. Remove wet clothing. Dry victim rapidly. Re-warm victim in dry clothing and/or blankets as quickly as possible or place in tub of warm, not hot, water. Give victim warm liquids to drink only if conscious. No alcohol. Don't attempt to warm the legs and arms. Heat that is applied to the legs and arms forces cold blood back toward the lungs, heart, and brain causing the core body temperature to drop. This can be fatal. Don't massage or rub the victim. Handle the victim gently, because they are at risk of cardiac arrest. Follow treatment for frostbite. Get medical help as needed.

Frostbite
Get the victim out of the cold. Warm affected areas as quickly as possible. Do not rub affected area or apply heat lamp or hot water. Do not rub snow on frostbitten skin. Warm hands by tucking them under your arms or companion's arms. If nose, ears, or face are frostbitten, warm by covering with dry, gloved hands. Discontinue warming techniques as soon as the affected area(s) become flushed. Expect swelling and pain after thawing. Gently exercise affected area. Elevate frostbitten areas, but not higher than heart. Get professional help as needed.

Poison
If you have cell phone and coverage, call Poison Control or 911. Follow directions. Keep sample of suspected poison and any vomit. DO NOT give victim anything by mouth or induce vomiting unless directed.

Shock
Lay victim on back with feet elevated. Lay on side if vomiting, unconscious, or having difficulty breathing. Keep victim warm, but not hot. DO NOT give food or drink.

Sunstroke (Heat stroke)
Symptoms may include extremely high body temperatures (106 F or higher), absence of sweating, dry skin, rapid pulse, losing consciousness. Sunstroke is life-threatening. Get medical help as soon as possible. Lower body temperature quickly with cool, not cold, water. Keep the victim cool until the body temperature has returned to normal. Do not give the person stimulating beverages such as coffee or tea.

Tick bite
Remove tick quickly and carefully. Use tweezers and grasp the tick near its head or mouth. Pull gently to remove the entire tick intact. Keep tick if possible in case you develop illness and your doctor wants to see the tick. Clean your hands and the area around the bite with soap and water. See your doctor if you develop a rash or fever, have muscle aches, joint pain and inflammation, swollen lymph nodes, or flu-like symptoms. Get immediate medical help if you have a severe headache, difficulty breathing, paralysis, or chest pain.

Blisters
Don't puncture the blister unless it's painful or prevents you from walking. If you feel you need to drain it, wash your hands and the blister. Clean the blister with an alcohol wipe. Puncture the blister in at least two spots near its edge with a sterilized needle. Carefully press to drain fluid. Apply antibiotic ointment to the blister, especially at puncture areas. Wash and reapply ointment as often as needed to keep the blister clean. Cut an opening the size of the blister in moleskin or molefoam and place around the blister to keep pressure off the painful area. Take pain medication as needed.

Burns
First degree burns are the least serious and affect only the outer skin layer. The burned area usually appears dry, red, and mildly swollen. Cool the burn with cold water. If a large supply of water is not available, use cold compresses. Do not put ice on the burn. Take pain medication as required.

Second degree burns affect the skin's lower layers. They are painful, swollen, and have redness and blistering. The skin may develop a weepy, watery surface. Second degree burns can be caused by severe sunburn, hot liquids, or contact with hot objects. Cool the burn with water for at least 10 minutes. Do not put ice directly on the burned area. Use antibiotic ointment or other cream or ointment as prescribed by your doctor. Cover the burned area with a dry non-stick dressing to prevent infection. Take pain reliever as needed. Change the dressing daily after washing hands with soap and water. Apply a cool, clean wet compress on the burn for a few minutes each day. Gently wash the burn and reapply ointment. Check daily for signs of infection such as increased swelling, redness, pain, or pus. Avoid breaking any blisters that form. Try not to itch healing skin. Protect burned areas with sunscreen for at least one year.

Third degree burns are the deepest and most severe and always require emergency treatment. They may appear white or charred and extend through all skin layers. There may be severe pain or no pain if nerve endings are destroyed. Do not take off any clothing that is stuck to the burn. Be sure the victim is not in contact with any smoldering material. Do not soak the burn in water because this could cause shock. Do not apply ointment or ice. The burn can be covered with a sterile bandage or clean cloth until you receive medical assistance. The cloth or bandage can be moist to avoid sticking and give relief. Do not use plastic.

This is not meant to be a complete list or solution for all emergencies. You are responsible for all your outdoor endeavors. Be prepared for emergencies. Hike light. Have fun. Be safe.

Chapter 29: Ultralight Backpacking Water Treatment

Water is one of the most important items in your pack, and one of the heaviest. You need it to sustain energy. You need it to avoid body aches, headaches, and becoming so uncomfortable that you don't enjoy your hiking experience.

If you can avoid carrying too much water, you'll enjoy a far lighter pack. Your ability to find safe water and know how and when to treat it is a valuable skill. Pathogens can sometimes be found in water that seems safe. Much of the water we find outdoors is safe, especially at high elevations and when you're near the original source. Always consider what is upstream, and err on the side of caution if you don't know what is above you. Does the water look clear? Don't worry too much about small animal life in the water. Worry more if there isn't any life in the water, and ask why.

Some experts talk about running water being safer than still water, but studies have found lake water to be among the cleanest because the ultraviolet rays of the sun kill bacteria near the surface. When taking water from a lake or pond, take water under the surface, but near the surface. Check the rate of water that is flowing into and out of the lake. Are there any stock animals or other animals that could make the water impure?

Much of the response to the threat of Giardia is overkill. A scholarly article titled, Giardia Lamblia and Giardiasis, With Particular Attention to the Sierra Nevada puts many fears to rest. It is written by Robert L. Rockwell, PhD. Bob Rockwell is an active mountaineer who made his first trip into the Sierra Nevada in 1952 to climb Mt. Whitney, and he repeats this climb several times annually. He has a bachelor's degree in Physics from UC-Berkeley, and a PhD in Aeronautical and Astronautical Engineering (Biomechanics) from Stanford.

The article is so good and informative, that its first seven paragraphs are quoted below:

Ask the average outdoors person about Giardia lamblia or giardiasis, and they have certainly heard about it. Almost always, however, they are considerably misinformed about both the organism's prevalence in wilderness water, and the seriousness of the disease if contracted.

With the advent of the Internet, the amount of information one can easily find on the subject is voluminous. Unfortunately, most of it is flawed in important aspects, being unsubstantiated, anecdotal, or merely quoting other unsubstantiated and anecdotal articles. Official sources, such as many informational publications put out by the US government, are not immune to this criticism.

This paper is the result of a critical distillation of relevant articles, retaining only those from scholarly, peer-reviewed, or otherwise professional and trustworthy sources.

One conclusion of this paper is that you can indeed contract giardiasis on visits to the Sierra Nevada, but it won't be from the water. So drink freely and confidently: Proper personal hygiene is far more important in avoiding giardiasis than treating the water.

First, an excerpt written by a highly regarded wilderness physician:

"In recent years, frantic alarms about the perils of giardiasis have aroused exaggerated concern about this infestation. Government agencies, particularly the United States Park Service and the National Forest Service, have filtered hundreds of gallons of water from wilderness streams, found one or two organisms (far less than enough to be infective), and erected garish signs proclaiming the water 'hazardous."

And another, by researchers who surveyed the health departments in all 50 states and scanned the medical literature looking for evidence that giardiasis is a significant threat to outdoor folk:

Neither health department surveillance nor the medical literature supports the widely held perception that giardiasis is a significant risk to backpackers in the United States. In some respects, this situation resembles (the threat to beachgoers of a) shark attack: an extraordinarily rare event to which the public and press have seemingly devoted inappropriate attention.

Water-borne pathogens are disease-causing bacteria, viruses, and protozoa you can get from impure water. Protozoa are hard-shelled, single-cell parasites, or cysts, that range from 2 to 15 microns in size. The giardia lamblia cyst is one of the most common water-borne parasites in the United States. Cryptosporidium is also a protozoa, and cryptosporidiosis exhibits symptoms similar to giardiasis, including diarrhea, fatigue, fever, weight loss, nausea, and vomiting. Bacteria are smaller than protozoa, and range in size from .2 to 10 microns. They include E. coli and salmonella. Viruses are even smaller at .004 to .1 microns, and carry diseases like hepatitis.

When hiking at lower elevations, you need to be cautious of manmade contamination from agriculture and industry, including herbicides, pesticides, and fertilizers.

No matter what water treatment system you use, be sure your hands are clean, especially after bathroom breaks. This is one of the most important points of this article. Impure hands can often transfer microorganisms to food or water, and the water gets blamed for the result.

Six main methods of purifying your water are available, and there are lightweight options for each.

1. Boiling

Boiling is the oldest and most basic way to purify water. A rolling boil will destroy any pathogens. You can kill microorganisms at sustained heat that is less than a boil, but it's difficult to measure in the field. Make sure the water is actually boiling. A rolling boil is big bubbles that shake the pan, not a few tiny bubbles on the bottom of the pan. To be safe, bring the water to a rolling boil for 3 to 5 minutes. As a general rule, add one minute of boiling time for each 1,000 feet of elevation above sea level. If you're using the water for cooking, there's no extra time, fuel weight, or cost involved. But boiling water for drinking is slow and tedious, and adds to the weight of the fuel in your pack. The real weight of boiling water is the weight of the extra fuel you need to carry.

2. Iodine

This has been the simplest, most compact, and most cost-effective system for many years. It kills bacteria and many viruses, but not cryptosporidium. Fortunately, cryptosporidium is still quite rare in North American natural water sources. Two tablets are used for each liter or quart of water (32 ounces). A quart is 95% of a liter. If you believe the water to be heavily contaminated, double the dose or contact time. In general, if you are in a hurry, double the chemical dose and halve the contact time. If you want better flavor, halve the dose and double the contact time. For cold water, the tablets take longer to work, so wait for the full recommended time. After adding the tablets to your water, you need to wait up to 30 minutes before you drink. If you rush the waiting time and drink the water, the iodine won't work to deactivate the pathogens in your stomach.

The most common brand of iodine tablets in the United States is "Potable Aqua." The bottle has 50 tablets that can treat up to 25 quarts of water. The suggested cost is $6.95. The packaging says "No unpleasant taste," but most people would strongly disagree, although the taste may bring back pleasant memories of camping as a youth. Even the Potable Aqua brand sells a version of the tablets that come with a second tablet to neutralize the taste. The suggested cost of the combination of iodine tablets and neutralizer is $10.95. This second "PA Plus" tablet that neutralizes the taste, iodine odor, and brown color of the water is simply vitamin C. You need to wait until the iodine has done its work before adding the ascorbic acid tablet. You can crush your own vitamin C and add it to the treated water. Remember to add only enough to make the water clear. Your body can handle extra vitamin C, but too much can lead to diarrhea. After the iodine has done its work, you can also add powdered drinks instead of vitamin C to mask the iodine flavor.

Experts argue over how much iodine is too much for the body. Iodine is essential to thyroid function. It is often added to salt because water and foods are sometimes deficient in iodine. With that said, the Potable Aqua packaging information says, "Not to be used on a continuous basis. For short term or limited emergency use only." Some literature suggests using iodine tablets for six weeks or less. Although iodine is rapidly metabolized and cleared from the body, you should not use iodine tablets if you have an allergy to iodine, an active thyroid disease, or are pregnant.

Iodine tablets come in a brown bottle to help protect them from large temperature changes. Keeping the tablets dry helps them remain more stable. The tablets will last for up to four years unopened, and seem to work more quickly if they are fresh. They degrade with air, water, or light exposure, but since they are inexpensive, they can easily be replaced every year. The manufacturer of the tablets suggests against switching to a smaller bottle. So, with that warning, if you make the switch, be sure to use a tight, brown bottle that keeps the tablets dry. Even the original cotton in the bottle is meant to absorb any moisture that may be present. If you re-package the tablets to a smaller bottle, try to keep a little of the cotton.

When you treat water in a container with a lid, be sure to let some of the treated water clean the threads of the cap.

Of course, you won't remove particulate by boiling water, using iodine or chlorine dioxide-based tablets, or ultraviolet light systems. So, if the water looks murky, you may want to start with a pre-filter that's as simple as a coffee filter or cloth.

The weight of a bottle of iodine tablets is 1.1 ounces. If you purchase the PA Plus that neutralizes the taste and odor, you'll double the weight. If you re-package the tablets into a one-dram (1/8 oz.) brown bottle, the weight of the bottle is just .2 ounces and will hold 40 tablets, for a total weight of only .3 ounces. If you want to add your own vitamin C and keep the weight down, remember that powders in small ziplock bags can get in the re-sealable closures of the bags and make them difficult to use. You may want to use the smallest, lightest plastic container you can find.

Another iodine treatment is iodine crystals. This product is marketed in the United States under the brand name "Polar Pure." About 30 small crystals of crystalline iodine come in a 3.2 ounce brown glass bottle. When the bottle is full of water the weight is 4.9 ounces. The suggested retail price is $12.95. You add water to the original small bottle for one hour before putting it in the water that needs to be treated. Of course, this pre-treating can be done as you hike. When you pour from the bottle, the crystals of iodine remain in the bottle. You can treat from 2 to 6 quarts of water at a time. After adding the solution to the water to be treated, wait 20 minutes before drinking.

Water to be treated that is colder than 68 degrees F will take longer. A warmer solution of the original mixture from the bottle will have a higher concentration of iodine. So, fewer capfuls will be required, and more water can be treated before refilling the Polar Pure bottle. You can warm the bottle in your pocket or in sunlight. Dosage instructions, as well as thermal reactive paint on the bottle, tell you how much liquid to pour from the bottle into the water that is to be disinfected.

Pure iodine crystals are stable and slightly soluble in water but evaporate easily. The Polar Pure bottle should be kept filled with water and tightly capped. Water that has been treated should be tightly sealed, too. After the necessary disinfection time, powdered drinks or vitamin C can be added to make the taste more pleasant. Polar Pure has an indefinite shelf life. One bottle treats up to 2,000 quarts of water, so it's very cost-effective. Some long-distance hikers have used the same bottle for their entire trip.

3. Chlorine dioxide

Another chemical treatment for water is chlorine dioxide. The most common brand is "Aqua Mira." The lightest version is a package with two one-ounce bottles that have a total weight of 3.1 ounces, including a mixing cap. The suggested retail price is $13.95. This kit will treat up to 30 gallons (120 quarts) of water. The advantages of Aqua Mira are its light weight, low cost, compactness, and good taste, as well as its ability to kill pathogens including cryptosporidium. Chlorine dioxide is used worldwide to treat municipal water supplies, and is known to be an eradicator of bacteria (E-coli, salmonella, legionella), viruses (rolio, rotovirus, hepatitis), and protozoa (giardia and cryptosporidium). The oxidation kills pathogens by breaking down their cell walls. There is no chlorine in Aqua Mira. Even though chlorine dioxide has the word chlorine in its name, the two chemicals have completely different chemical structures. Part A of the kit contains 2% stabilized chlorine dioxide in an aqueous solution, and Part B contains phosphoric acid activator.

To treat a quart of water, you place 7 drops of Part A and 7 drops of Part B in the mixing cap. If the water is cloudy or tinted, use 15 drops of each. You let the mixture react for 5 minutes, and then add it to the quart of water. Shake to mix. Let stand for 15 minutes. If the water is very cold, cloudy, or tinted, let stand for 30 minutes. Some people report a chlorine-like odor. The promotional literature, and some testers, report that the treatment improves the taste of the water. Chlorine dioxide does not discolor water. The kit has a four-year shelf life even after it is opened. Chlorine dioxide is available in tablet form in the Aqua Mira brand as well as some other brands, but takes much longer to use.

4. Filtration

Filters can give you treated water quickly, without any chemical taste. They work by trapping pathogens in a microporous screen. Some viruses are too small to trap. Only filters with an iodine matrix are capable of killing all viruses. All filters eventually need cleaning, sometimes in the field. Filter lifetime is determined by the quantity and size of particles in the water. Filters may also clog from the growth of organisms in the filter medium. Some filters can be back flushed. Some can be chemically cleaned. Some need a replacement filter. Ceramic filters can be cleaned and can last a long time, but care must be taken so they don't break, especially when it's cold. To qualify as a water purifier, a device has to meet the Environmental Protection Agency standard of removing 99.99 % of all identifiable bacteria, protozoa, and viruses. Finer filters generally mean slower and more difficult pumping.

Filters can be as small and simple as the "McNett/Aqua Mira Emergency Frontier" filter that uses activated carbon to filter up to 20 gallons of water. It is used like a straw, weighs less than an ounce, and retails for around $10. Lightweight "bottle filters" from such companies as "Bota of Boulder," "H2O On Demand," and the "Katadyn Exstream" are light at about five to eight ounces, and inexpensive at around $20 to $50. Some list incredibly high microorganism and contaminant removal, including 99.99% removal of giardia and cryptosporidium. Of course, these filters aren't free flowing. You have to suck to get the water through.

Pump filters include well-known brands like "Timberline," "Katadyn," "First Need," and "MSR/Sweetwater." They can be as light and inexpensive as the Timberline Eagle at 5.6 ounces and $25. This filter is one of the fastest and works well in water that is not heavy in particulate. The Katadyn Hiker is not the lightest at 11 ounces, but is a favorite because it is so user-friendly. It retails for $60. The Katadyn Mini Ceramic Microfilter is among the lightest at 8 ounces and is known for its quality. The price is $90.

Backpackers like gravity-fed filters because of their obvious advantage of getting filtered water without the pumping. The Katadyn Base Camp weighs 12.1 ounces and has a suggested retail price of $65.

5. Ultraviolet light devices

Ultraviolet light is becoming popular because it's effective in quickly killing all microorganisms. The ultraviolet light destroys their DNA which prevents them from reproducing. Early models were expensive and didn't work with a wide variety of water containers, but that's all changing. The "SteriPEN Adventurer" weighs 3.6 ounces and ships with two CR123 batteries. Rechargeable batteries are also available. Nickel metal hydride batteries are recommended for cold weather use. This style or lithium disposable batteries will give you about 200 treatments. The Adventurer can purify a quart of water in 48 seconds. The cost is $129.95.

The "mUV water purifier," or "AquaBobber," from Meridian Design, Inc. weighs 2.4 ounces and costs $49.99. It operates with an internal battery that can be recharged by attaching its magnetically connectable leads to almost any external battery including AAA, AA, C, and D sizes. The device floats and can be inserted into almost any container, including a standard water bottle opening. A quart of water can be treated in 90 seconds. You can perform 20 treatments per charge.

Agitate the water gently, until the light tells you it's done. UV purifiers don't work in murky water, so if that's the only water you have, you'll have to pre-filter it until it's not cloudy. You also need to make sure you don't drop a UV device.

6. Sodium hypochlorite (Household bleach)

A large number of agencies and websites, including the Red Cross tell you that ordinary bleach, such as Clorox or Purex can treat water in emergencies. The Clorox website lists these instructions:
"Disinfection of Drinking Water (Potable)
When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of this product, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified contaminated water to a clean container and add 8 drops of this product to 1 gallon of water (2 drops to 1 quart). Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor. If not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers several times. For cloudy water, use 16 drops of this product per gallon of water (4 drops to one quart). If no chlorine odor is apparent after 30 minutes, repeat dosage and wait an additional 15 minutes."

The dosage listed is for treated city water, so lake and stream water will likely need the higher amounts. Use only liquid bleach that contains 5.25% to 6% sodium hypochlorite and doesn't have any perfumes, dyes, or other additives. Be sure to read the label. Treating with bleach should be thought of as an emergency method. Although countless websites list this method of treatment, they do not show data for effectiveness against giardia, cryptosporidium, and other pathogens. And these sources do not list the effects of long-term use on the body.

Now you're equipped with a wide variety of water treatment options. Your region and style of camping will tell you what water treatment is right for you. Hike light. Have fun.

Chapter 30: The Principles of Leave No Trace – A Perfect Match for Hiking Light

The principles of Leave No Trace are common sense practices for all hikers. Note how they go hand-in-hand with ultralight backpacking. The first Leave No Trace principle, Plan Ahead and Prepare, is the very essence of hiking light. Planning ahead insures that you'll pack lighter and have less impact on the environment. The second principle is to travel and camp on durable surfaces. All the Leave No Trace principles are common sense guidelines. When you hike light, you're closer to nature and every step is softer. Hike light. Have fun. Leave no trace.

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 back country 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.

Bonus Chapter: Hiking Light – And Finding Your Way With Map And Compass

No matter how light you want to backpack, never hike without a map and compass. Weather and other circumstances can change rapidly. Always know where you are and how to stay found by remaining in place or using an emergency exit route. The following website explains how to use a map and compass. Hike light. Have fun. Be safe.

http://egsc.usgs.gov/isb/pubs/factsheets/fs03501.html

Bonus Chapter: Hiking Light – Here's a Quick Link to Find Your Magnetic Declination

Even when hiking light you should take your map and compass. When you travel and hike in a new area, remember that your magnetic declination changes. Most maps include the declination. If you trim the map and carry only part of it, make sure the declination is written somewhere on the remaining part of your map. Magnetic declination in a location will change slowly so it's good to update your maps. The following website explains how to quickly find your magnetic north declination. Just insert the zip code for a city near your hike, or the latitude and longitude. Then, click on "Compute Declination." You'll be given the declination in degrees. Hike light. Have fun. Be safe.

http://www.ngdc.noaa.gov/geomagmodels/Declination.jsp

Hiking Light – We're at the End of the Trail

We're at the end of the trail. It's been a great trip. You've read about light gear, light food, light clothes, and having more fun. You've strengthened your commitment to hike light and feel the increased freedom it brings. Your increased wisdom and planning will give you a lighter pack and help you feel closer to nature on every hike. Tips on insect control, water treatment, buying gear, equipment care, trail hygiene, first aid, and staying found will increase your comfort and safety. Simple, light gear will take less space in your home and be quicker to pack. You'll leave a lighter footprint on your environment. Share the information with others. Help them float down the trail, too. May all your adventures be fantastic. Hike light. Have more fun!

If all this information has made you excited to reduce the weight of your backpack, remember that all the lightest gear can be found at www.hikelight.com.