Olympia Branch of The Mountaineers
Alpine Scrambling, Climbing and Hiking Programs

Wilderness Skills

Ten Essentials
Boots, Clothing and Equipment
Wilderness Ethics (LNT)
Stewardship
Nutrition and Conditioning
Mountain Weather
Hazards and Emergencies
Navigation

Open to all - Mountaineer members and the general public
Wilderness Skills is designed to prepare area outdoor enthusiasts for hiking or backpacking in the forests, mountains and trails of the Pacific Northwest. This course is also the foundation or class prerequisite for the Alpine Scrambling Course and the Basic Climbing Courses.

The Wilderness Skills Course consists of four evening presentations and one Navigation and Outdoor Skills Workshop (field trip) to a local park site for practice of the new skill.

Lecture 1: Knowing the essentials, clothing and equipment
10 Essentials, clothing, boots and equipment for day hikes or overnight trips - Examine traditional clothing and equipment and the latest high-tech gear and low-tech alternatives

Lecture 2: Knowing how to prepare for the Wilderness
Wilderness Ethics/Leave No Trace – Nutrition – Physical Conditioning – Intro to First Aid – Preventing Injuries and Handling Emergencies

Lecture 3: Knowing the Wilderness environment.
Avoiding hazards and understanding weather for safe, enjoyable travel - Where to Go and how to get to the "Great Places to Go" in the Pacific Northwest

Lecture 4: Navigation (Map and Compass)
Introduction to Backcountry Navigation provides hands-on instruction in map reading, using a compass, navigating in the backcountry, terrain association, what to do if lost and how, when and where to use GPS

Outdoor Workshop - Learn and practice new skills
This field trip takes the students to a park to learn and practice their new skills on an outdoor challenge course where they learn using the guided Discovery instructional method while becoming proficient with the 10 essential.

To earn a course completion certificate, students will also accompany Mountaineer leaders on a hike or backpacking trip of their choosing.

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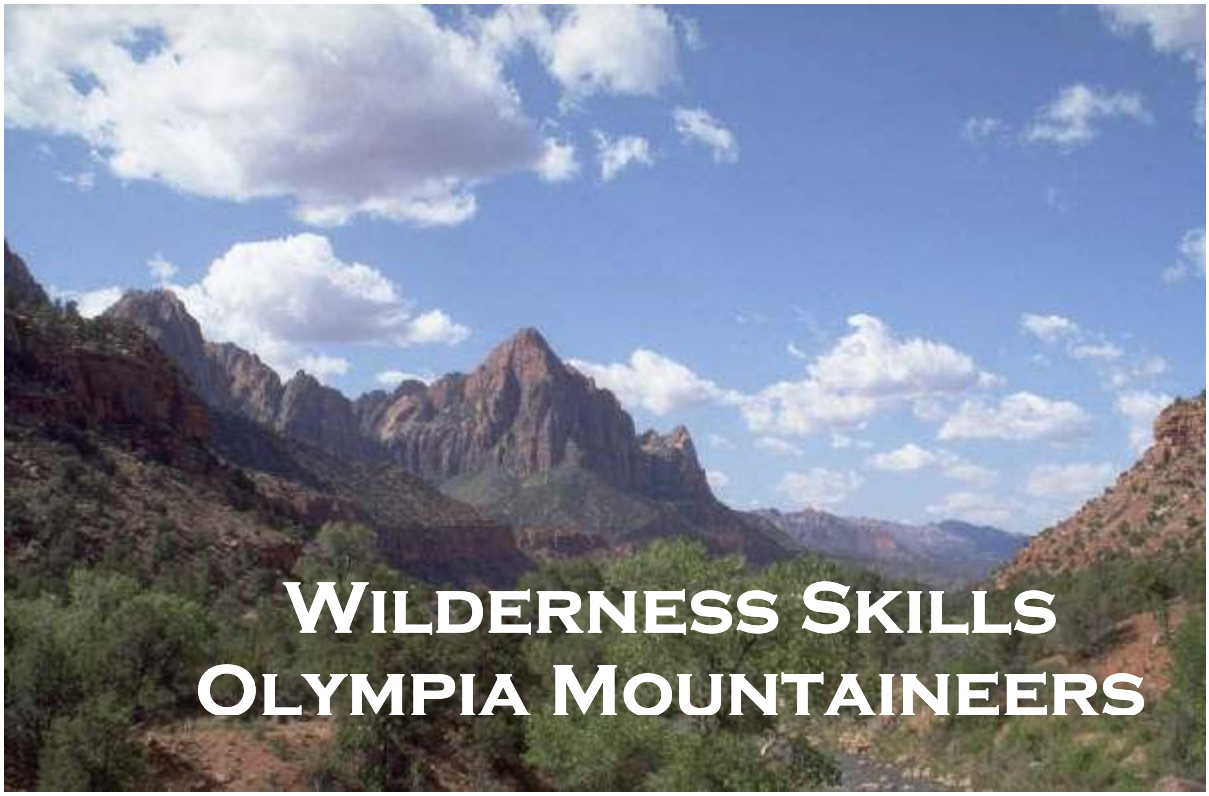


Introduction

Overview

Welcome to Wilderness Skills and the Olympia Mountaineers. This is an exciting event in the history of the outdoor training program of the Olympia Branch of The Mountaineers. You are among the first students to take the ***Wilderness Skills Course***, and we are as eager as you to get started on a successful new adventure. The Olympia Mountaineers have decades of experience in offering the best mountaineering and outdoor training programs in the South Sound area. Even so, the organization is constantly looking to make improvements. , developed a new approach to offering our community courses and information for getting out into the wilderness, enjoying the alpine environment, reaching the summit of some of North America's most revered mountains, or simply enjoying the trails in our local and state parks.

In response to the demanding personal schedules and the growing diversity of interests of today's outdoor enthusiast, the traditional course structure is continuously updated and improved. The Olympia Mountaineers created the new Wilderness Skills course to provide both a quality introduction to hiking in the backcountry and a foundation for other mountaineering courses and activities of the club. This course is designed to meet the instructional needs of people with a wide range of interests, skills and aspirations. For some students this may be the only course needed to furnish them with the information, skills and self-confidence to enjoy a life-time of safe, personally rewarding travel in the backcountry. For others, Wilderness Skills will be the first of many adventures that include a membership in The Mountaineers.

The Wilderness Skills course offers a solid introduction to safe backcountry travel principles and skills in a light-hearted and flexible atmosphere. Your time in the mountains should be fun and engender a feeling of camaraderie. This sense of community will serve to enhance your enjoyment of backcountry travel. For those who are joining The Mountaineers, this course provides a first-rate illustration of the clubs' training system and spirit of volunteerism that encourages and supports the personal growth of member. For a few students, this introductory course will also lay a foundation for leadership responsibilities and possibly a role as a future course instructor and program leader. Each course demonstrates the critical role that volunteers play in every aspect of club. Today's students will become tomorrow's instructors and leaders.

The Course Committee, along with the instructors, lecturers, field trip and hike leaders look forward to presenting this course information and to introducing students to new skills. The course instructors are also interested in learning from students. Everyone brings new information to the class, including their own personal experiences, perspectives and values for enjoying the freedom of the hills. Realize your input is important to your classmates and instructors. We appreciate your ideas, comments and full participation.

Course Description

Wilderness Skills provides information and hands on experience with the **top twenty+** topics considered important for safe adventures in the backcountry. The lectures are intended for all audiences and include practical tips and personal experiences to help you get started right or to expand your outdoor abilities. The lecture and interactive presentations include opportunities to learn and practice wilderness skills, to examine an assortment of clothing and equipment and to enjoy visual presentations of recent trips through Washington's breathtakingly beautiful backcountry. Student participation and interaction are encouraged.

The Wilderness Skills Course consisting of 4 evening presentations and one Navigation and Outdoor Skills Workshop (field trip) to a local park site for practice of the new skill. The course can be offered in a few different configurations depending on the audience. The following course structure is designed for those interested in hiking and will be set up so that

Lecture 1: Knowing the essentials, clothing and equipment
10 Essentials, clothing, boots and equipment for day hikes or overnight trips - Examine traditional clothing and equipment and the latest high-tech gear and low-tech alternatives

Lecture 2: Knowing how to protect yourself and the environment
Wilderness Ethics/Leave No Trace – Nutrition – Physical Conditioning – Intro to First Aid – Preventing Injuries and Handling Emergencies

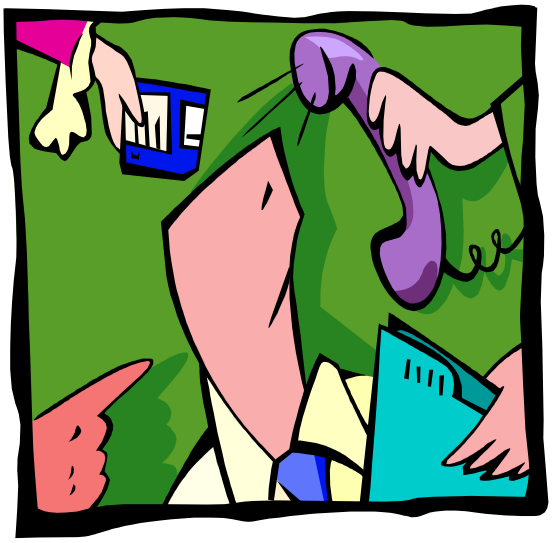
Lecture 3: Navigation (Map and Compass)
Introduction to Backcountry Navigation provides hands-on instruction in map reading, using a compass, navigating in the backcountry, terrain association, what to do if lost and how, when and where to use GPS

Outdoor Workshop - Learn and practice new skills
This field trip takes the students to a park to learn and practice their new skills on an outdoor challenge course.

Lecture 4: Getting out into the Wilderness.
Avoiding hazards and understanding weather for safe, enjoyable travel - Where to Go and how to get to the "Great Places to Go" in the Pacific Northwest

Requirements for a Course Certificate of Completion

There are no formal prerequisites; however, prospective students are advised that hiking in the Pacific Northwest requires good physical condition, a positive mental attitude, a collection of quality outdoor clothing and equipment, and a significant commitment of time and effort. **Participation in all lectures and field trip is required for graduation *(course certificate).*** Students who miss a lecture or the field trip may be forced to complete the course by making up the lesson during a future course, unless participation at another branch can be arranged.



This strict requirement applies to all Mountaineer courses. Each year a number of students are disappointed to discover they are not going to be able to complete the course in their first try. For those with a very busy schedule, it's reasonable to expect that you may need to attend a lecture or field trip at another branch or during a later course offered in Olympia.

Sometimes, students loose heart, gradually withdraw and eventually drop out when they must seek alternative class dates or locations. We'll try hard to find students alternative classes so that they do not have to leave unfulfilled. If you should discover you have a scheduling conflict or other questions about course requirements, please consult with the Wilderness Skills Course Chair at your earliest opportunity.

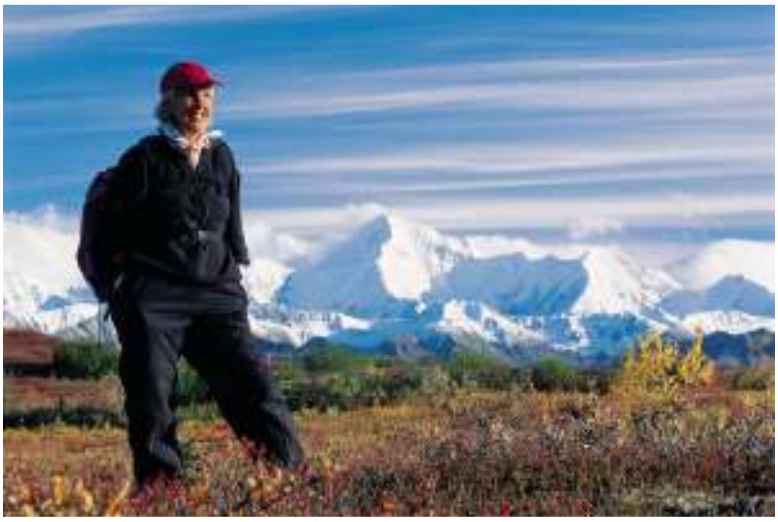
On the bright side, most two-year students appreciate the extra attention of a longer journey to the summit (graduation). We know you have many demands on your time so the Wilderness Skills instructors have compiled a list of the very few alternatives possible for completing the course.

Generally students need a second opportunity to complete a course because of the following obstacles:

Problem: The student was unable to attend all classes or the field trip because of a conflict.
Solution: **CAREFULLY REVIEW THE COURSE SCHEDULE** and be sure to set aside the necessary dates and time required. Should a scheduling conflict arise, be sure to contact the Course Chair as soon as possible to see if there are any alternatives. Unfortunately the alternatives are few in number and difficult to arrange.

Problem: The student was unable to complete the required hike or backpacking trip.
Solution: Each month the club's magazine, **The Mountaineer,** contains a large section called the ***Go Guide*** that lists outings for club members. The *Go Guide* lists hikes and backpack as well as climbs, alpine scrambles, sea kayaking trips and others outings for each of the seven western Washington branches of the club. Students will be eligible to participate in almost any of the hikes and most backpacking trips, unless there are special skills or other requirements. Remember, you will be competing with other club members for an opportunity to participate on such trips, so register early. In addition to the monthly list, the Olympia Branch's Hiking Committee is planning to add several hikes for Wilderness Skills students. These hikes will be announced at lectures and you will have an opportunity to sign up for one at the lectures.

Problem: The student experiences an emergency or simply forgets the class.
Solution: Contact the Course Chair and don't give up. We'll try to think of something. If you find you must wait for another class to complete a course requirement, consider taking one of the other excellent courses the branch offers such as Navigation or Sea Kayaking. Many of the most committed graduates take two years to complete a course and we're all better off for it.



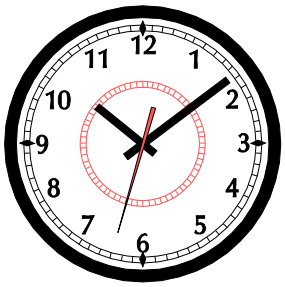
Course Procedures in Review

Travel in the wilderness is demanding even for skilled outdoor professional with years of experience. Living in the natural world requires knowledge, adaptability and resourcefulness because our natural environment is not under our control. While we are actually outside to play, we must also be ready to respond to the very serious threats we may experience in the natural world, where we are only visitors.

Teaching a diverse population to explore the wilderness or climb mountains with the backcountry as a classroom requires structure, discipline and rules that are based on sound and safe practices tested over years of instruction. At times, it may seem there are too many rules. We expect that you may get frustrated with the inflexibility of the course instructors. However, with nearly a century of experience training in mountaineering skills, The Mountaineers have learned that these rules make it possible for students to be safe and successful in a mountain environment filled with risks. Here are the rules you will need to follow.

1. **Be on time** at the designated location. The instructors and other students are anxious to get started and will not be able to wait more than 5 minutes for late arrivals.
2. **Be courteous** to the lecturers and trip leaders. They are volunteering their time and experience to teach you. Listen to them.
3. **Follow instructions**. The information being presented and demonstrated to you is based upon sound wilderness travel and outdoor living techniques. There may be more than one way of doing some of the techniques presented to you, but for the purpose of consistent instruction and safety, standardized techniques will be taught.
4. **Do not litter**. Carry out everything you brought in.
5. Thoroughly **learn and practice The Mountaineer Standards and Wilderness Ethics** presented in this manual.
6. **Be patient** and expect that you will already know some of the material to be presented. Because students come to the course with vastly different backgrounds and experiences, this introductory course is designed to bring everyone to a common level of understanding, skills and techniques. Some students will be hearing and learning nearly everything for the first time while others, with more experiences, will be able to contribute to the training.

Schedule Times and Attendance



Please be on time to lectures, field trips, and hikes.

You must sign in to receive credit for lectures. You must attend all lectures and field trips to graduate from the course. **Lectures start promptly at 6:30 p.m.** Please be prepared by completing any required reading and practice.

Lectures are nearly impossible to make up, so plan accordingly.
Please review your personal commitments and schedule early in the course. If you must miss one of the Lectures or the Outdoor Workshop, consult with the Student Liaison for instructions.

Outdoor Workshop

The Wilderness Skills Outdoor Workshop (Field Trip) has been designed to provide you with some practical experience in wilderness travel and outdoor living techniques prior to the time they are actually needed. In order to meet the intent of the workshop, the following procedures have been adopted:

1. **Student must have attended all lectures in order to participate in the outdoor workshop or to get credit for the required outing (hike or backpacking trip)**.
2. **Sign-up** for the outdoor workshop or a hike with the designated person before the trip. Early sign-up is necessary to provide adequate time to prepare detailed trip plans according to the size of the group.
3. **Bring the equipment required**. A list of the necessary equipment for the outdoor workshop or for an experience outing (hike or backpacking trip) is provided later in this manual and will be reviewed prior to the events. Mark your equipment with your name or initials so that it will stand up to abrasion and moisture. Each student must have his/her own individual equipment and lunch.
4. **Be cautious**. There is always a degree of risk in any outdoor activity. Pay attention to and follow your instructor's advice. Your safety and enjoyment are directly related to your cooperation.
5. **Stay until the finish**. No student will be permitted to leave the outdoor workshop practice site until the entire class has safely returned or the student is released by the workshop leaders. The leaders will be taking a role call to be sure everyone is accounted for. Those who leave unannounced cause considerable work and anxiety while the group searches.
6. **Be responsible**. While on any trip, you automatically assume a responsibility to your fellow students and instructors that takes precedence over any other personal obligation.

Hikes

Experience outings (hikes or backpacking trip) are designed to provide you opportunities to put into practice the skills you have learned through course lectures and field trips. For this reason, the following additional procedures have been adopted:

1. Always leave information about your destination, expected return time, and the field trip leader's phone number with a responsible person. Instruct this person that if you are unreasonably late in returning, they should call the LEADER'S contact phone number and NOT emergency organizations (e.g., the Sheriff's Department).
2. Pay your fair share of transportation costs.
3. The Hiking Committee and/or the trip leader will arrange sign-ups for experience trips. Sign-ups will close at 9:00 p.m. two (2) days prior to the trip. When you sign-up, indicate whether you can take passengers or need a ride. The trip leader will attempt to match riders with drivers whenever possible. Notify the trip leader of ANY CHANGES in the transportation arrangements you originally requested.

How to read and use the GO Guide
The following is a typical hike listing from the monthly Go Guide. The various parts are numbered with explanations in the key below.

> **Sept. 10th,Sat.[1]-Fremont Lookout[2]** (E)[3] (GT Mt. Rainier E.)[4] 5.5 mi.,1200' gain.[5] Superb view of Mt. Rainier. Meet 9:30 a.m. at Martin Way P&R. Leader: Jane Doe,[7] 360-754-1669.[8] (s8/30-9/7)[9] MR[10]
>
> [1]Date and date of trip
> [2]Destination
> [3]Trip difficulty classification, in this case, easy
> [4]Type of topographical map to be used
> [5]Round-trip distance and elevation gain
> [6]Time and location of meeting point
> [7]Leader's name
> [8]Leader's phone number
> [9]For trips handled by Seattle switchboard, first day to sign up with switchboard, last day to cancel
> [10]Abbreviated title of guidebook (see guidelines in magazine for coding)

How to sign up for a Hike or Backpack Trip -- Olympia Branch
Call the leader, preferably at least a week before the trip date. For Olympia trips, you may sign up directly with the leader by phone call or e-mail. Please note that, as good as our leaders are, they are not clairvoyant. When leaving a phone message or e-mail, please leave your first and last name, your phone number with area code or e-mail address, your Mountaineers Branch affiliation, and the date and destination of the trip you are interested in. If your message is incomplete, or unclear, the leader may not be able to return your call and you will miss out on the trip.

If you need to cancel, call the leader as early prior to the trip date as you can. This will enable the leader to add people from the waiting list. Because there is a limit to how many people can go on a trip, it is important to release your spot as soon as you know you will have to cancel. If the hike is full when you call the leader, you will be placed on a waiting list and called if a space opens up.

Carpooling. t the meeting place, the leader will ask for volunteers to drive, riders should be prepared to pay the driver 5-8 cents per mile. Be prepared for the possibility you might need to drive, with your fuel tank full and your car in good repair.

The Mountaineers Policies and Standards (As applicable for Wilderness Skills)

All members of ***"The Mountaineers"***, in order to attain the Club's purposes -- ***"to explore, study, preserve and enjoy the beauty of Northwest America"*** -- in a spirit of good fellowship, shall subscribe to the following standards:

1. Exercise personal responsibility and conduct themselves on Club activities and premises in a manner which will not impair the safety of the party, or prevent the collective participation and enjoyment of others.
2. Respect private property.
3. Enter the outdoors as a visitor, leaving behind no debris, environmental scars, or other indications of their visit, which would reduce the enjoyment of those who follow.
4. Minimize the environmental impact on the outdoor by using campfires only in designated areas and extinguishing completely after use; conducting human sanitation and washing away from water courses; and carrying out all solid waste brought into the outdoors.
5. Pets, firearms, or any other item(s), which would impair the safety or enjoyment of others, shall not be brought on Mountaineer premises or taken on Club activities.

6. All applicable and specific regulations of governmental agencies which affect Mountaineer activities and property must be obeyed.
7. Alcohol, illegal drugs and any drugs or medications incompatible with Mountaineer activities are not allowed on **any** outdoor activities, and are cause for dismissal from the course. This policy applies to students, leaders, and organizers, and includes all Committee-sponsored activities at *The Mountaineers* lodges, course field trips, and outings.

Course Expectations

During this course and future outings, you, your classmates and your instructors will invest time, energy, and money in seeing you through to graduation. We are confident that you will find your investment will return large dividends in years of safe, enjoyable and satisfying outdoor experiences. Because we take your investment seriously, we recommend that you carefully this section to be sure you understand your commitment and our expectations. We want you to have a realistic understanding of all that the course requires and an accurate expectation of what you will be learning and doing during and after the course.

Your Wilderness Skills instructors are deeply committed to meeting expectations and will work hard to ensure students learn and receive their money's worth, within reason. Some start with basic instructional courses with the intent of advancing to the Alpine Scrambling or the Basic Climbing Course. Others are satisfied with the basics of outdoor travel. In either case, it is our intent to teach mountaineering skills in such a manner that students who wish to go no further than hiking or backpacking, may see that activity as an end in itself, rather than feel an obligation to advance to Alpine Scrambling of technical climbing. Each student needs to take a few minutes to complete the **Course Expectation** form on the following pages to help articulate his or her expectations for taking the course. This form gives students an opportunity to rank their interests in the various course topics as well as their own personal motivations for participating in the course. Where possible, the instructors will use your responses to align this and future courses toward students common expectations.

Wilderness Skills Course Content	**Course Expectations** When you enrolled, how important were these topics to you Very Important ← → Unimportant				
Topics of Instruction	**5**	**4**	**3**	**2**	**1**
The **Ten Essentials** of outdoor/ wilderness travel					
Selection and use of **clothing and equipment**					
Learning how to **prevent injuries**					
Learning techniques to provide **proper nutrition and hydration**					
Learning **route finding** skills for adventures in backcountry					
Learning the **physical conditioning** requirements and how to prepare					
Learning **Navigation** skills (Map and Compass)					
Learning to identify Outdoor **Hazards and Hazardous Weath**er					
Learning skill to go **Off-Trail**					
Getting back **in shape**					
Finding a (any) way to **get outdoors more often**					
Building greater **self-confidence in the outdoors**					
Learning about **Leave No Trace** requirements and Wilderness Ethics					
Finding directions to **Knox Administration Center**					
Preparing to **travel/climb with non-Mountaineer friends**					
Meeting people to enjoy and **share the freedom of the hills**					
Take a step toward **leading Hikes with the Mountaineer**					
Preparing to take the **Climbing Course in the future**					
The **Ten Essentials** of outdoor/ wilderness travel					

For decades the Olympia Branch of the Mountaineers has offered a variety of outdoor training courses including: Alpine Scrambling, Basic Climbing, Winter Travel, Sea Kayaking and other human powered travel courses. We believe we are serving a need of South Sound residents, but we may be misleading ourselves. What motivates you to participate is very important to us. What attracted you to the course, how did you heard about the courses and why did you decided to enroll? Your thoughts will add reality to our perceptions.

We'd really appreciate knowing this stuff.	**Please Answer Something Below.** Your comments are very useful and our only source of authentic student background information.
How did you hear about **Orientation Night** ?	
How did you hear about this year's **Wilderness Skills** course?	
How long have you been considering taking this course?	
Why did you decided to enroll this year?	
Did you know which course you favored prior to the Orientation?	

What method(s) of promotion do you recommend for future courses?		How valuable 5 = High 1 = Low
Postings at local Outdoor Retailers? Please specify.		
Postings at local Parks and Recreation Departments?		
Postings at local Colleges and High Schools? Please specify		
Postings at work sites. Please specify.		
Posting at local grocery or retail stores? Please specify.		
Postings at local community bulletin boards? Please specify.		
Radio Broadcast? Please specify station(s).		
Publish in local Organization Newsletters? Please specify.		
Person-to-Person (student to friend)?		
Distribute flyers or written course outline? Please specify location.		
Other		

Student Manual and Course Text

The Wilderness Skills Committee has developed this student manual to provide you with a course overview, to enhance each lecture and the outdoor workshop and to explain how to successfully complete all the requirements for graduation. This manual contains essential information for your enjoyment and success in this course. Students should carefully review the pertinent information in the manual before each lecture and before the outdoor workshop.

Course Text Books

You are not required to purchase a text book for this course. Most mountaineering courses conducted around the nation and many others parts of the world have adopted ***Mountaineering - The Freedom of the Hills,*** published by The Mountaineers as the course text book. ***The Freedom of the Hills*** is considered the leading text in North American mountaineering. Should you decide to go on in mountaineering you will find ***The Freedom of the Hills (7th Edition*****)** to be an excellent text and source of information long after you have completed your first or your fifth course of instruction.

There are a number of Hiking and Backpacking guides published by The Mountaineers that are great references texts and are written such that they follow and support the format of this course. A brief list of such reference books published by The Mountaineers includes:

Wilderness Basics – from the Sierra Club
Day Hiker's Handbook – from Backpacker Magazine, © 2003 by Michael Lanza
Trekker's Handbook – from Backpacker Magazine, © 2003 by Buck Tilton
Trekking Washington – from Backpacker Magazine © 2003 by Mike Woodmansee
Leave No Trace – from Magazine © 2003 by Annette McGivney

In addition to the many advice and reference guides The Mountaineers also published scores of guide books that provide basic backcountry travel information and point to point trip descriptions of dozens of classic and unique hikes. You can usually find a limited number of these books at the public library or you may be able to borrow a copy from friends. Students can also purchase a copy at *"The Mountaineers"* bookstore at the clubhouse in Seattle, or can order a copy by mail at 206-284-6310. Most local book stores have copies or can order them.

Clothing and Equipment

Selection of clothing and equipment will be covered during the course. At a minimum, you will need a pair of serviceable, backpacking or hiking boots suitable for long-tern use, a day pack capable of carrying up to 20 pounds in comfort, adequate clothing for your protection and comfort in any of the various weather patters expected in the Pacific Northwest, food, water and the 10 essentials. If you have little or no usable equipment, expect equipment expenses of up to $500.00, if you buy new equipment. Careful and selective bargain hunting, however, may reduce this estimate considerably.

Reasonable Goals and Personal Responsibilities

When participating in the outdoor workshop, a hike or a backpacking trip, remember that you are responsible for your own safety and well-being at all times. To put it plainly, the workshop or hike leader is not a tour guide. Come to the outdoor workshop and any hike you may choose with the requirements for the day, the expected weather conditions, and all proper equipment you think necessary. Be flexible enough for changes in schedule due to weather of other unexpected events. Don't blindly follow other students or instructors through the day's activities. Stay alert and pay attention to your location and your return route. After all, if you become separated from the party, you may have to lead yourself and others out of the mountains.

The Ten Essential Systems

The Ten Essentials, first developed in the 1930's, have been required on all Mountaineer backcountry outings for decades. The exact list has evolved over the year and today may be referred to as a System, as a reminder that the backcountry traveler must select the proper items for the terrain and techniques the trip requires. A climber's 10 essentials will likely be different in technical design and capacity from those of a day hiker's. A system encourages you to give greater consideration to the nature and capabilities of each essential in relationship to the demands of the activity in which you will be participating.

The Ten Essentials are intended to provide protection against the raw forces of nature and to offer emergency assistance for the kind of calamities that occur in the backcountry. They are useful for a variety of every day necessities, quenching thirst, showing the way to your destination, trimming your nails or providing illumination when the sun sets. Most importantly, they are indispensable when things go wrong. The 10 essentials are selected to provide you with the basics to spend an unplanned night (or more) in the backcountry. The Mountaineers require that all party members must have their own essentials; a group package won't meet the needs.

If you're like most people, a memorized list of 10 items, such as groceries, test answers or street names has a short lifespan. Associating the 10 essentials with one of three basic applications can become a quick mental checklist review as you pack for a trip. Try divided the essentials into three groups (to help you remember them): (1) finding your way, (2) for your protection, and (3) for emergencies.

Finding Your Way

1. Illumination: A headlamp or flashlight with extra batteries and bulb

These should be lightweight and reliable. Headlamps work much better for backcountry use because your hands will be free to hold on to rock, brush, etc.;. You can also wear a headlamp around your neck if you don't like it on your head. Use only alkaline or lithium batteries (lithium batteries are the lightest, most durable, and least sensitive to cold temperatures, but are the most expensive). You will need to know the remaining battery life or buy new batteries frequently.

One excellent strategy to help you track the remaining battery life is to use nickel metal hydride or nickel cadmium instead. These kinds of batteries are rechargeable, and so are easier on the environment and cheaper over the long run. But their most important advantage is that they can be fully charged before every trip for increased safety.

To keep the batteries from running down when not in use, you can carry them outside of the flashlight until needed or put one battery in upside down. When you need a flashlight, you can quickly load the batteries properly and have full use of the batteries. Extra bulbs should be stored to avoid breakage. Test your light before each trip.

2. Navigation: Map and compass

A detailed topographic **map** of where you are going (and how to get back) and a **compass** are basic navigational tools. The trip leader decides the initial destination but each individual needs the tools to be able to confirm the correctness of the route and his or her location on the route should a problem arise. You should ***NEVER*** go anywhere without a compass.

It is hard to imagine getting turned around 180 degrees, but it happens. Once you lose that all-important sense of direction, the backcountry suddenly appears featureless, inscrutable and hostile. Compasses come in a variety of sizes, shapes and prices - you should carry one that you are comfortable with and can use. There is more information on compasses in the **Navigation** section later in this manual.

A USGS or comparably detailed topographic map has been the standard for all backcountry travels. Fold your map so that it shows the area in which you will be traveling, then carry it in a protective map case or zip lock bag will keep your map dry and readable.

For Your Protection

3. Hydration

You can survive for days without food provided you conserve your energy. Do not waste energy looking for food. **You must have water to survive**. Going for even a day without water will make you seriously vulnerable to sickness or incapacitation.

Always carry at least one water container and two or more on a hot day with a long trip. Again, if you plan to carry only the water you will need for the day hike, what will you do if the trip is extended due to an unexpected event? Soda is not a good substitute for water on a hike.

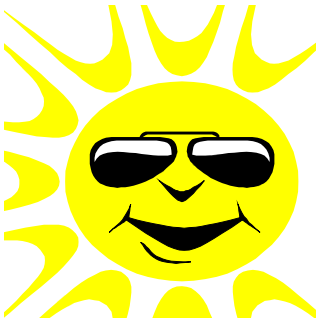
4. Nutrition: Extra food

In addition to your regular lunch and snacks, take along extra food: enough so something is left over at the end of the trip (in case your day is extended or you need to spend the night on the mountain). The food should require no cooking, be lightweight, and be high in carbohydrates (granola bars, cheese, nuts, etc.). The extra food is to provide energy and, as importantly, to boost morale. If you select extra food with a long shelf life you will not have to replace it after each trip. Pack your extra food separately from your lunch and trail snacks so you will not be tempted by it. ***Your extra food should be for emergencies only!!!***

5. Insulation: Extra clothing

Your extra clothing should get you through 24 hours in the worst conditions that can be realistically expected for the time of year and the trip route chosen. Extra clothing should be wool or synthetic - ***NO COTTON!!!*** A minimal list of extra clothing during cool wet weather would include a shirt or sweater, a hat or balaclava, gloves or mittens, extra socks and liner socks, extra polypro underwear (shirt and leggings), and rain gear. The extra clothing should provide you with an extra measure of warmth and protection from the elements. Take more than you think you will need for the expected weather and be prepared for any unexpected changes in the weather.

6. Sun Protection: Sunglasses and sunscreen



Protection against snow blindness and eye damage is critical because cornea damage occurs before any discomfort is felt. Glasses should be very dark and block out most or all ultraviolet (UV) rays and, ideally, offer side protection (wrap-around lenses or side shields). In 1994, *Consumer Reports* tested over 200 pairs costing $15 - $150 and found that they all blocked UV rays, so take your pick. But don't buy glasses with mirror-finish lenses; they reflect sunlight onto your nose. Glass fogs more easily in cold weather; polycarbonate scratches more easily.

Sun protection is important at high altitudes and on cloudy/overcast days as well as on bright/snowy days. The intensity of the sun's rays increases 4% with every 1000 feet of elevation gain. Non-water soluble sunscreen with SPF of 15 or higher is desirable. Without adequate protection against both direct sunlight and reflected light, damage to skin and eyes can occur.

For Emergencies

NOTE: There are extraordinary emergencies, such as animal attacks or natural disasters that we read about or envision in our worst nightmares. They do happen, but for the most part are confined to specific locations, usually well posted and at specific times, generally well forecasted. Be sure to research local warnings carefully.

The types of situations for which you will need to prepare are far less severe yet potentially as dangerous, and much more common. A situation becomes an emergency when the environment is unsafe for your party to spend additional time, even overnight, to resolve.

7. Repair kit and tools: Knife

The number one tool for multipurpose use is the pocket knife. They are indispensable for use in first aid, emergencies, equipment and clothing repairs, and food preparation. The knife should be small, lightweight, folding, and sharp. Tools may come as part of a knife if the knife can remain lightweight; otherwise a few small lightweight tools are likely to meet most needs. Carry only those tools you are likely to need. A repair kit should contain duct tape, safety pins, cable ties, short pieces of wire, cord and hook and loop (Velcro TM) and repair fabric.

8. First aid kit

Foot travel dictates you'll need to include materials to keep "hot spots" on your feet from turning into blisters. Also plan to carry supplies for cuts, scratches, burns, sun burn or sprains and other common injuries when you are hours from the trailhead and further still from the doctor's office or the emergency room. If you store first-aid items in plastic bags within your first-aid kit they will be easy to find and will stay clean and dry.

Your first-aid kit should be clearly marked in your pack so that if you are injured someone else could quickly find your supplies and not have to open everything in your pack in the search. This is particularly important if you have a medical condition such as asthma or an allergy to bee stings which require the prompt use of special medication. Consider taking the Mountaineering Oriented First Aid (MOFA) course. It will provide an excellent set of skills for emergency response as well as a comprehensive list of first aid supplies.

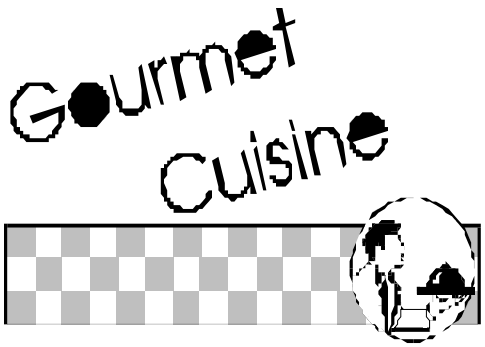
9. Fire: Waterproof matches and fire starter

Fire will be needed if you have a trip-extending emergency. Carry the means to start a fire in any possible condition. A number one choice is windproof matches in a waterproof container with a compatible striker. Fire starter comes in a variety of forms: candles, fuel tablets, fuel ribbons, butane lighters, chemical fuel, tinder, etc.....in case of an emergency --something that will hold a flame long enough to start a fire with wet wood. For starting damp wood fires, the constant flame of a candle is excellent, and it's amazing the amount of light and heat that a candle will provide. Check your favorite equipment supplier and see what you would be most comfortable using and stowing in your pack.

10. Emergency Shelter

Some form of emergency shelter may be necessary for overnight protections against the elements. On the minimalist side a plastic trash bag or piece of plastic sheeting can serve as a short-term shelter. A bivy sack and a small tent are examples of shelters that offer greater protection for more severe conditions. In between these you will find that rip-stop nylon makes a lightweight, waterproof material while a plastic tarp with grommets offers waterproofing at low cost. Consider the conditions in which you may find your party and select your shelter accordingly. Consider an insulating pad or a reflective emergency blanket in cold weather to help protect against heat loss and hypothermia.

Food and Water - Nutritious, lots of it



Without proper and adequate food and water the body will slow down, signal problems, and eventually shut down. A hiker needs a continuous supply of calories from food or substance specifically intended to serve as a source of calories. On a one-day strenuous hike of 4 to 8 hours, a person probable needs only one mid-day meal and several food breaks. The most common diets contain:

- a large complex carbohydrate source
- a medium sugar source
- a small to medium protein source

The most common menu among hikers includes:

- a favorite high-energy snack that is very likely to be eaten even when not feeling well
- a favorite sandwich with meat or some form of protein
- fruit or dried fruit or vegetables
- granola or grain

Take items that you know that you like to eat. Most day hikes include a brief lunch at the mid-point or summit, but you will want to snack *en route* as well. Trail mix, granola bars, nuts, fresh or dried fruit, cheese, and crackers are good choices for snacking while hiking or during short breaks. Eat frequently, even if you don't feel hungry: your body reacts to stress and cold by erasing the desire for food (and water) when it's needed most. During cold weather, eat and drink small amounts frequently rather than large amounts infrequently (this will provide more available energy to maintain body warmth).

Many Olympia Branch leaders will suggest stopping to eat somewhere after a day hike. (It's optional.) You'll have a chance to stretch and rest, and you won't have to cook when you get home! You'll have an opportunity to discuss the day's trip with your friends, get to know each other, and have a good time.

Water, two liters minimum

Drink, drink, drink - even if you don't feel thirsty. Thirst is a poor indicator of the need for water. Your body reacts to stress and cold by reducing the desire for water (and food) when it's needed most. Performance starts to decline when you lose as little as 2 percent of your body weight in water, and it's not unusual to lose 3 or 4 pounds of water during a strenuous up-hill hike. It's a good idea to have a bottle carrier on your pack waist belt so you can drink water without having to take off your pack. A water bladder with a drinking tube is another option. Since drinking directly out of mountain streams is no longer advisable, you should carry enough water for the entire day, or carry a water filter.

Water is as vital to life as oxygen – about 70 percent of your body weight is water. It has many functions:

- distributes your energy supply – water helps carry nutrients and oxygen to your muscles.
- eliminating waste – water provides liquid for urination, which carries away wastes and reduces muscle cramps and soreness (urine will be light in color if you are drinking enough water).
- lubricating your joints; maintaining proper muscle tone.
- controlling your body temperature:
    - water cools you in warm weather (by sweat evaporation), protecting you from high body temperatures, which could cause heat exhaustion or heat stroke.
    - water warms you in cold weather by providing more blood to your extremities.

Drink as much water as you can the night before a strenuous outing and in the morning before leaving, to reduce your need for water during the trip. Drink until you slosh! You should also drink plenty of water after you return from a trip, to replace liquids lost while you were out -- you will be less sore afterwards and recover faster. Headaches, during or after a long, hard day may be a sign of dehydration.

During cold weather, it is even more important to consciously drink water, because you don't see or feel yourself sweating like you do when it's hot. Furthermore, because cold air doesn't hold as much moisture as warm air, your body must use its moisture to warm the cold air that you breathe before it gets to your lungs. Drinking warm water will conserve body heat and energy. Consider carrying an insulated water bottle carrier and put hot water in your bottles before you leave (you can add boiling water to a polycarbonate (Lexan) bottle as long as the bottle is not too cold). You may want to carry a thermal bottle in cold weather.

In freezing weather, carry or store your water bottle upside down; if the water begins to freezes, the ice will form at the top of the up-side-down bottle where the air is, and won't freeze the threads. The drinking tube of a water bladder can quickly freeze and become useless in very cold temperatures. Be prepared to access the water without the tube. On overnight trips when the night time temperature is at or below freezing, there may be no running water available in the morning. You will likely need to melt snow or ice with your stove and then filter the water for safe drinking. Boiling the water is an option, but will require considerable time and fuel.

Clean your water containers regularly, especially if you use them for sugary drinks: mold or bacteria can grow on bottle threads or in drinking tubes, and may make you sick with dysentery.

Clothing and Equipment

This section and the accompanying lecture is meant to offer additional information on clothing and equipment -- what it costs, where to get it, what you will need for success during the course's required field trip, and what factors you should consider for a lifetime of enjoyment in the backcountry. We will look at your equipment during the upcoming outdoor workshop and if you wish, during lectures when appropriate, to be sure your equipment will meet the demands of this course. Your instructors may also be able to make recommendations on practical ways to minimize your expenditures.

With new gear being developed as you read your materials, you need to remember this information is not up-to-the-minute. Having the right equipment can be a life-long pursuit. There's always new and improved gear available to consider. Many people enjoy researching and shopping for the "right" gear to help improve their performance and enjoyment.

As a student, you'll notice some experienced outdoor travelers have become first-rate technical experts on clothing and equipment. Their opinions are valuable to you, since you'll probably be making substantial purchases in the near future. You may also find their opinions very useful in purchasing "experienced" (used) equipment. Please feel free to ask questions and compare opinions.

You may notice the occasional "***Gearhead"*** who has simply overdone the quest for gear. Gearing Up can be a sport in itself. But it's not really necessary unless you are planning a solo expedition to an uncharted wilderness or an epic backpacking trip into a very remote location.

At the other extreme is the ***"Minimalist"*** who enjoys the challenge of carrying as little as possible and relying on wits and resourcefulness to overcome any emergency. Duct tape and painkillers don't really serve well as a first aid kit, nor does a trash bag serve as extra clothing and rain gear. It's nice to know you can improvise in a pinch, but the lack of basic backup equipment can be very hazardous. By making it a habit to carry only what is absolutely going to be used, a person is not really prepared for the unexpected and is likely to become a liability to companions or other encountered on the trail.

Backpacker Magazine published as article by Kristin Hosteller in June 1999 titled **Modern Man Vs. Mad Dog,** which chronicles the experiences of both the Techno-packer and the Minimalist. It's an amusing but very common dual between what cool new stuff to take and what to leave at home. Although the article does not choose a winner, it does suggest that an individual who can focus on trail rather than the gear is the likely victor.

You'll no doubt find yourself somewhere in between these two extremes. As you gain more experience you need to evaluate your equipment. You'll learn you won't use or even need all that your asked to carry. This spring, you find yourself on a trail carrying a heavy pack and you'll see others with almost nothing. They may look happier and less burdened with their load. Resist the temptation to believe their bliss is worth the risk. The natural world can be a hostile environment, even for the most experienced. There's no doubt that your 10 essentials will someday be used to comfort or repair or rescue someone who has not bothered to carry the basic necessities for a safe, secure trip.

Boots

Without a doubt, the single most important item of equipment is your boots. Whether you rent, borrow, or buy is up to you; but it is critical to your comfort and safety that you do not try to cut corners by using inadequate footwear. Heavy-duty boots will protect your feet from rocks and other rough terrain, allow you to kick steps in snow, and help you maintain your balance on steep snow slopes. Good quality, lightweight boots are becoming much more reliable and popular. They have the advantages or being more comfortable and easier on your feet, legs and muscles because they require less energy to lift. Inferior quality shoes, court or basketball shoes are not acceptable and will not be allowed on the outdoor workshop or club hikes or backpacking trips

A good boot has a full-leather upper, a stiff toe and shank, lug soles, and a square heel. Leather boots can be used for snow travel, trail hiking and backpacking, and off-trail travel. One-piece all-leather uppers are best because they have few seams to leak and will conform to the shape of your foot. Tapered heels will not work for hiking or carrying a heavy pack. Soft waterproof rubber sole boots are not acceptable because the shank is too flexible, and is not adequate for kicking steps in snow. Plastic boots keep your feet warmer and dryer in snow, and may offer better footing when kicking steps up steep snow slopes, but are not at all comfortable or suitable on trails.

A good "mountaineering" or outdoor store can help you choose appropriate boots for hiking and backpacking. Go to a reputable dealer who is knowledgeable and will take the time to work with you. Buy a good insole to replace the insoles supplied by the mountaineering boot manufacturer. Standard factory insoles typically do not provide adequate arch support. It is best to use the better insoles when trying on boots, as they drastically alter the fit of the boot. Remember to check out the return policy and buy boots from a store that will exchange them at no cost after several trips for another size. Getting the right size for a boot can be a trial-and-error process.

Try on new or rental boots using the insole, liner, and socks (thick outer and thin liner socks) that you plan to wear on hikes or while backpacking. It is best to shop for boots late in the day because your feet get slightly larger after you stand or walk on them for a while. Your toes should not touch the front of your boots (with the foot laced securely in the boot) even when you scuff your foot firmly forward. Cramped toes become cold toes because of reduced circulation. A sloppy heel fit will cause nasty blisters. Seek out boots that are as comfortable as you can find. *The best boot for you is the one that fits the best.*

Wear your new boots to work, around the house, or on short hikes to break them in before wearing them on a hike of any distance over a couple of miles. If your planned hike has any elevation gain, be sure to break in you boots (and your feet) by walking up hill. When possible and not destructive to the landscaping, walk on the side of the road, in the gravel and over uneven terrain. Walking on sidewalks or road surfaces does not prepare you foot/boot combination for the real world and does not help you build up the necessary foot/ankle strength you will need to carry you weight and pack up or down hill.

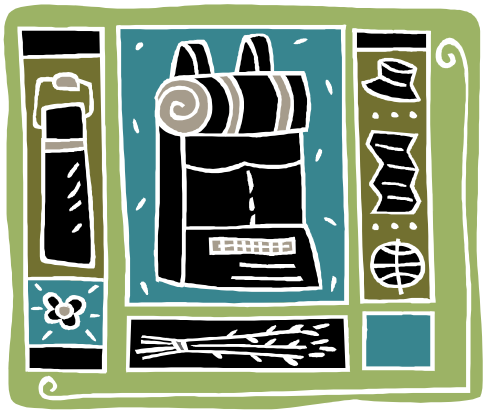
Prevent blisters. Blisters develop when your boots are going one way and the bones of your feet are going another, rubbing and stressing the skin. In addition to buying well-fitting boots, breaking them in properly, and using a quality insole, try the following to prevent blisters:

- Wear a thin inner sock and a thicker outer sock, to keep friction between the socks instead of between your boots and feet.
- Retie your bootlaces snugly before a steep descent to prevent toe blisters.
- If your feet sweat heavily, use foot powder. Moisture encourages blisters.
- If you know you have a blister-prone area, protect it before trouble develops, with:
- moleskin - soft cotton flannel with adhesive; sold in outdoor, department, and drug stores.
- *Compeed* - a blister cover with tapered edges that resist the tendency to roll up.
- *2nd Skin* - it's cool and soothing, but must be held in place with tape or moleskin.

A sore "hot spot" will develop before a blister forms. If you feel a "hot spot", apply moleskin or other protection to the spot as soon as you can. Duct tape or other tape may help, if nothing else is available.

Clean your boots immediately upon returning from each trip; they are easier to clean when they are still damp. Remove the insoles so that the boots can dry inside and not mildew; stuff crumpled newspaper inside them to absorb moisture. Waterproof your boots as needed. Use the waterproofing treatment the manufacturer recommends and according to manufacturer's directions.

Clothing



Because your clothing is so important to your success and personal safety, many instructors suggest you think of it as your first item of equipment. Wearing the right clothes into the mountains is pretty, darn important. Fortunately, good outdoor clothing is sold almost everywhere. Unfortunately, not-so-good clothing is even more accessible. In fact, it seems that outdoor adventure is one of the leading fashion themes for today's adults.

Practicality, durability, protection from the elements and versatility are traditional features of outdoor clothing, while technical advances in fabric and design have added to their comfort and attraction. Yesterday's styles looked rugged if not homely, but thanks to some discerning marketing, appearance has become as important as function to the style conscious. But, what makes a garment suitable for serious outdoor use? Are today's trendy, high-tech clothes better than traditional clothes worn for decades? Do you get what you pay for when you spend $70.00 for a set of wonder-tech undies verses a $15.00 pair of wool long johns.

The choices you make when selecting and packing your clothing determine how comfortable you will be during your journey. The simplest, most common aspects of life, putting on your clothes, become critical to your enjoyment or contribute to your misery. On a day trip in the backcountry or an overnight backpack through on of the state's many Wilderness areas these choices may also determine your success and your safety. The following information will help you better understand what you really need to know to buy clothes for a comfortable, safe journey in the mountains.

Understanding and applying a few elementary principals of thermodynamics, physiology and fabric technology can help you choose the best clothing for your needs. These basic concepts include: Heat Production, Temperature Requirements, Heat Retention, Insulation, Moisture Management, and Weather Protection. With the following information, you can apply a little science to your challenge of selecting clothes for safe and comfortable adventures, or you can buy what everyone else is wearing and skip this stuff.

The following information also covers some practical lessons on selecting the right clothes for your needs. This information should help you select an item of clothing for its adaptability, range of applications, price, longevity, ease and cost of care, and finally appearance.

Practical Information for Selecting the Right Clothes

Heat Production

The human body generates heat as result of normal metabolism, the oxidation of the food consumed or stores in the body. When the ambient temperature, the temperature of the surrounding air, is around 70° F, a healthy body generates more than enough heat to stay comfortable. With exertion, the body will produce excess heat, and will heat the air around it. During the average day of modern office-home activity, a person burns between 100 and 200 calories per hour. At this level of exertion a person will perspire, but at a low level that will usually evaporate rather than accumulate.

During 4 to 6 hours of high exertion during a scramble with 3500 ft elevation gain, the body consumes greater quantities of energy ranging between 250 and 1000 calories per hour. This level of exertion will generate great quantities of excess heat and perspiration for all but the most fit climber or the coldest weather conditions. The scrambler will need an effective system for venting this heat or suffer wetness from the body's natural cooling agent; perspiration. Worse consequences include; exhaustion, disorientation, and heat exhaustion.

To reduce the build up of body heat, the efficient hiker will simply shed clothing as the most common option. During rain or snow conditions, this doesn't work as well. A great deal of heat will be trapped inside rain gear although most of the insulating clothing has been removed. Traditional options for ventilation include oiled or raw wool, poncho, or stop and cool down. New options include breathable, waterproof clothing with zippered vents or waterproof; non-breathable clothing that functions as a vapor barrier (a moisture trapping system).

Temperature Requirements

To function properly, the human body maintains a core temperature (central organs and brain) of nearly 100° F, actually 98.6° F. The core temperature must be stay within a narrow range because the central organs cannot tolerate changes of more than a few degrees above or below 98.6°. The extremities, such as the arms, hands, feet, and skin however, can adjust to a much wider range of temperatures. Your face, for example, is able to endure a temperature range of over 50° F (from 40° to 90°) without noticeable difficulty. With core temperature change of 3 to 4 degrees, however and you'll feel sick and look sick.

In the outdoors, a person feels comfortable when the air temperature is approximately 70°, although that is a difference of 30° between the outside temperature and the core. At this temperature, a person is able to effectively heat the air around the body and needs very little clothing. At higher ambient temperatures, clothing isn't really needed. As the air temperature rises, the body protects the core temperature by eliminating heat through increasing perspiration and respiration. When the air temperature decreases, the body also reacts to maintain the core temperature by producing more heat through involuntary shivering and other responses.

With the air temperature drops below 70° F, more clothing is needed to maintain comfort and the critical core temperature. In the mountains, when the air temperature drops, a person unable to add thermal protection (more clothes) will eventually experience a decrease in core temperature. As the core temperature drops to 96 ° the body responds by spontaneously shivering and forming goose pimples on the surface of the skin. When the core temperature reaches 93 ° the body reduces the blood flow to the extremities as the body works to preserve the core at the expense of the arms and legs, which loose heat much faster. The result is a loss of dexterity and performance. As the core temperature continues to drop a person experiences progressive loss of mental acuity, unconsciousness, and eventually will die. Survival in a cold environment requires proper clothing to insulate the core temperature of the body (temperatures are approximate).

Heat Loss

The body looses heat in several ways. **Convection** is the loss of heat as the warmed air surrounding the body rises and escapes through the openings in the clothing and is replaced by cooler air. It's referred to as the chimney effect. **Conduction** is the exchange of heat from a warmer object to a cooler object through physical contact. **Radiation** is the transmission of thermal energy, primarily through infrared radiation waves. **Evaporation** of perspiration from the skin results in the loss of heat energy. **Respiration** results in heat loss when warm air is exhaled and cooler air is inhaled. The amount of heat lost to each of these factors will vary depending on the weather conditions, clothing, exertion, and the ability to stay dry.

During the strenuous hike, a person with high quality clothing looses heat mainly through conduction, contact with cooler air. A smaller amount of heat is lost through radiation and perspiration and a small amount yet through convection and respiration. Factors that shape the heat loss include: the kind and amount of clothing, the amount of wind and water in the environment and the hikers level of exertion.

OK, We understanding heat loss is important, but what really matters is the way we can use this information to vent excess heat in hot weather and reduce heat loss in cold, wet weather.
By understand that through convection, the warm air inside clothes will rise and flow out of openings in clothes only to be replaced by cooler air, allows the informed hiker to cinch down openings and billowing clothes to better contain warmth. By understanding that by reducing exertion rather than rushing through the bush with poor clothing, could help the lost hiker stay warm because it will help conserve body heat by reducing perspiration and respiration. By understanding that conduction, contact with cooler air, is often the greatest cause of heat loss, the informed back country traveler can take control of this loss by better insulating high heat loss areas from contact with cooler air.

The body has a few **high heat loss areas** where there is high arterial blood flow and little or no muscle mass to shield these areas. These high heat loss areas include the head, the neck, under the arms, down the sides of the torso, and through the groin area. Protecting these areas with greater insulation can significantly reduce heat loss and help the entire body stay warm. The old saying, ***"if your feet are cold put on a hat",*** is very true.

This information could be useful to the hiker who reaches the summit on a cloudy, wet day. After a 20-minute rest at the summit, a hiker begin to descend and notices the temperature is dropping. As exertion decreases on the decent, heat production decreases. Unprotected heat loss areas will eventually give up lots of body heat. Without a hat and an open collar, the hiker will loose heat rapidly, much faster than it's produced. After a shivering spell, the hiker will notice her hands and feet become not only cold, but stiff. The body has begun to restrict blood flow to the extremities. At this point, it is too late to simple protect heat loss areas. The hiker must quickly add heat.

Better clothing takes advantage of these heat loss areas by allowing ventilation during excessive heat output, and ensuring protect during critical heat loss periods. A jacket designed with heat loss areas I mind will provide a hood and zippers under the arms, down the sides of the torso and up a high collar.

When the body becomes wet, moisture increases heat loss. Water is an excellent conductor of heat and will absorb and transport heat energy rapidly. In water, a body looses heat 25 times faster than in air. As mentioned earlier, a person fees comfortable with an air temperature of 70° F. In water that is 70° F, a person can feel comfortable for a while, but will eventually loose too much body heat to the water to stay in this environment long. We are not able to heat the entire pool and the conduction won't stop. The swimmer may feel OK, but as the heat loss continues, the person will begin to exhibit signs of hypothermia. Increasing activity may make the body feel warmer temporarily, but it actually increases the rate of heat loss. Staying dry is a most important factor in maintaining control over body heat. (See Moisture Management and Weather Protection.)

Insulation

Insulation functions primarily to trap and protect a thin layer of air around your body. Insulation does not produce or provide any heat. Heat is generated through your body's metabolism and increases with exertion. For the alpine scrambler, air is the best available insulator. All garments trap your body's heat in the air spaces of the fabric, however some are superior to others. The more small cavities a fabric provides where air is trapped warmed by body heat and protected from cold air conductivity, the better it insulates.

Steel wool could act as an insulator because it can trap heat in the air spaces in its wool-like structure. Steel wool however, has other significant disadvantageous that eliminate it as a fabric for clothing. Can you list any?

It is important to note that a person who is suffering from hypothermia, abnormal lowering of the body core temperature, should not be insulated from the cold without receiving additional heat to slowly re-warm the core. Wrapping a hypothermia victim in sleeping bags stops any loss or gain in heat. If the victim's extremities are cold they will remain cold and may even contribute to further heat loss of the core. Follow the suggested protocols for providing heat to the core of this victim.

Moisture Management

As noted above, water is an important factor in determining persons' ability to survive and to stay comfortable outdoors. It is a necessity for life. On any hike, moisture management ranges in importance from a matter of personal choice to survival. At one point the hiker may be concerned with comfort and personal hygiene, and must deal with too much perspiration or excessively dry conditions for the skin. At another point, the need for drinking water or to combat hypothermia due to wet clothes could preoccupy a hiking party.

For the body to perform effectively, it needs sufficient quantities of water. To stay warm, a hiker must consume plenty of water, even before feeling thirsty. Be sure you have it or can get it. (see Food and Water)

For the hiker to be comfortable, she must be able to vent heat and allow perspiration to evaporate. Clothing designed to wick moisture away from the body also removes heat energy. This same garment will move the moisture toward the atmosphere, which will allow evaporation of the moisture to further remove heat energy. Designing clothing with moisture wick qualities rather than a moisture barrier has become the leading strategy in helping the outdoor enthusiast enjoy more comfortable and safer outings. Clothing has also been designed to allow the moisture producing areas to receive extra ventilation through zippered openings or patches of material that allow better air flow.

Weather Protection

Regular clothing can't protect you very well from rain, snow, high heat, and wind. When its wet outside and the temperature drops, the need for protection is serious. You will need a garment that will keep water out and your insulation layer dry, while allowing your moisture-managing layer to continue to move water vapor your clothing to the outside. Since most garments are good at only one of these jobs, you'll need decide which combination of characteristics will meet your needs on any specific hike: to protect yourself from wet weather, or to protect yourself from you own moisture. The weather forecast and the nature of you trip will help dictate which you choose.

Wind is often overlooked as a factor in outdoor travel. Although the weather forecast includes wind speed and direction, it is usually overshadowed by information on the chance of rain, snow or sunshine. An unblocked, continuous wind will remove body heat and body moisture. A strong continuous wind is a threat to the backcountry traveler who can not provide or find adequate wind protection.

What does it all mean to me?
It helps explain why a *layering system* is mentioned in every outdoor guidebook. It's hard to imagine wearing clothes without layers. In the outdoors, the layering system becomes the most practical and effective way of maintaining your comfort and safety. Each layer has at least one job to accomplish.

Next to the skin	Wicking Layer	Moisture management
In between	Insulation Layer	Thermal Protection from Heat Loss
Outside	Shell Layer	Protection from the forces of nature exposure

Several layers of clothing provide greater temperature control and flexibility than one or two bulky items. All clothing should be loose fitting for maximum freedom of movement (if in doubt about which of two items may fit better, get the larger one). The clothing next to your skin should wick moisture away and insulate even if wet from sweat or rain. Avoid nylon for the inner layers because it doesn't breathe. Outer layers should provide warmth. Avoid down and cotton because neither will insulate when wet.

Fabrics

Clothing manufacturers can choose from many natural and man-made fabrics. But, why would anyone pick clothing made from natural materials when chemists have gone to all the trouble to create modern textiles? Aren't these petrochemical miracles superior to what nature has provided? Many are superior, but each has its place in outdoor clothing and equipment. To understand how fabrics perform you must look at the fibers and the construction techniques used.

Natural Fibers
Cotton is an ancient fabric dating back 12,000 BC, but it was not in wide use in clothing until modern times. Today cotton is the principal clothing fiber used throughout the world. Cotton is a plant fiber that grows in ball form, having short fibers about ¾" long. Cotton is quite versatile and can be processed into many different fabrics including canvas, sail cloth, muslin, duck, organdy, poplin and many others. It is soft, comfortable, absorbent and economical.

Cotton breathes, shrinks, wrinkles, and is easy to dye. Traveling in a warm climate, cotton's ability to breath and its absorbency is quite useful, as water absorbed into the fabric will conduct heat energy away from the source toward a cooler environment. Even if the air temperature is higher than the skin, evaporation of the moisture will have a cooling effect. Because of its absorbency, a cotton bandana is one of the most versatile pieces of equipment you can carry. For outdoor use in cooler climates, however the cotton fiber's absorbency is a serious disadvantage.

Flax is a nearly woody fiber that comes from a plant stalk. Flax is made into LINEN, once the main material used I clothing. Today linen and a linen-cotton blend are used in more luxurious clothing. It is very comfortable, highly absorbent, wrinkles easily and is expensive. Its cost and absorbency should eliminate it as a choice for hiking clothes.

Ramie is also similar to linen and is a plant fiber. It has a high luster and an unusual resistance to bacteria and molds. Used in fabrics, and often mistaken for linen, it is extremely absorbent and dries quickly. Ramie has excellent abrasion resistance and has been tested to be three to five times stronger than cotton and twice as strong as flax. It is an inexpensive fiber from an East Asian plant and can be spun or woven into a fabric.

Hemp is currently being used by designers in clothing. No, hemp fabric does not contain the narcotic chemical that, when smoked produces the "high" that smoking marijuana produces. Hemp fabric is made from the stems of the plant. The stems are processed to dissolve the gum or pectin and separate the fibers, which are then

processed again and woven into yarns and fabric. Hemp fabric is like linen in both hand and appearance. Hemp fabric withstands water better than any other textile product. It wrinkles easily and should not be creased excessively to avoid wear and breakage of the fibers.

NOTE: Clothing made of plant fibers will capture and hold perspiration and precipitation. Through conduction, these wet fabrics will rapidly transfer body heat. In the alpine regions of the Pacific Northwest, cotton, linen, ramie, and hemp are not an acceptable choice for clothing and can be hazardous to the backcountry traveler because when wet these fabrics will draw body heat away faster than it can be replaced.

Wool is an animal fiber made of protein. It is a complex fiber, covered with a water-resistant cuticle and contains honeycombed air spaces within the fiber itself. Wool is processed in a number of ways, to wield softer easier to care for fabrics. The more processing the wool receives the less natural water repellency remains in the fibers. Wool is resilient (wrinkle resistant), absorbent, versatile, and has a wide range of weights. It requires great care in cleaning to avoid permanent shrinkage through compression of the fibers. Wool has been used for centuries in cold, wet climates because it retains most of its insulation qualities when wet.

Silk is also of animal protein origin, created by a caterpillar building a cocoon for its transformation to a moth. Silk is not a fiber but rather one continuous filament from 300 to 1,000 yards long. The filament is a triangular shaped rod with uniquely high strength and superior insulation for its weight. Silk is luxurious, durable, absorbent, and very soft. It requires extra care to avoid shrinkage, continuous loss of color, and water spotting. Silk is most commonly used in thin insulating garments and in a blend with wool and polyester in heavier garments. As an insulator it is very efficient but because it is absorbent it will hold some moisture. Because it is so thin the moisture will usually evaporate quickly, initially cooling and then insulating in a short period. To some people, silk simply feels so good that its moisture retention is easily overlooked.

NOTE: Natural fibers like cotton and wool can be distinguished from man-made fabrics because the fiber will burn rather than melt.

Man-Made Fabrics

Rayon was the first man-made fabric to be used in the construction of garments. Created in 1884 in France as artificial silk, rayon is a cellulose derivative, or boiled down wood pulp (Spruce). Once the wood is in solution, it is forced through spinnerets and hardened in a chemical bath to form a continuous filament (the same process the silk worm uses). Rayon is best known for its soft feel and draping characteristics. It has many of the qualities of cotton, is economical, strong, extremely absorbent, and is easily wrinkled. Although a durable fiber, it cannot tolerate water and is difficult to clean. Rayon is most frequently used in a blend with other fabrics that are more easily cleaned. Its leading characteristics are not consistent with outdoor use.

Nylon was created in the 1930 as petroleum based fabric, to replace silk in parachute manufacturing. It is created in a continuous filament. The manufacturer is able to give the filament different shapes and in turn create different qualities and textures. Nylon is strong, versatile, economical, elastic, resilient, non-absorbent and dries quickly. It can be crimped during processing to form **LYCRA.** Nylon melts at high temperatures. Because of its strength and ability to stretch, it makes an ideal climbing rope, abrasion resistant pack material and outerwear.

Acrylic is a petrochemical and plastic-like in nature. It is a lofty, thick, lightweight fiber. Acrylic is soft, supple, economical, dries quickly, draws moisture away from the body and is washable. It does not hold it shape well and abrades easily. Acrylic is typically used in sweaters and other insulating garment, but does not have the strength or durability to be used for outerwear in the outdoors.

Polyester is a strong fiber that is resistant to crease and wears exceptionally well. Created in 1953 as Dacron Polyester it gained fame during the double knit fad of the 1950. As a result many people dislike polyester and are unaware of its wide versatility and exceptional properties for outdoor clothing including it excellent ability to wick moisture and breath. It is manufactured in many weights and has become the leading man-made fabric. Although polyester is used extensively in blends with other fibers, cotton-polyester blends should be avoided in outdoor clothing because the cotton's tendency to absorb and hold moisture offsets the benefits of polyester.

Polypropylene is one of those rather versatile polymers out there. It serves double duty, both as a plastic and as a fiber. As a fiber, polypropylene is used to make indoor-outdoor carpeting because polypropylene doesn't absorb water, like nylon does. It is high temperature resistance and excellent chemical resistance, low water absorption, and a low price. Polypropylene is fabricated into the base or wicking layer for outdoor clothing. In recent years Polypropylene has been replaced in many clothing items, especially upper torso clothes, by polyester, because of its tendency to retain odor and to reshape itself into a scrunched mass after laundering.

CONSTRUCTION

In general fabric construction consists of woven, knit or non-woven (matted) yarns. There are several different techniques for each construction method. Almost all clothing purchased for alpine use is woven by machine. Occasionally you see knit clothing made by hand. Types of weaves have often been mistaken for types of fabrics. For example, satin is a type of weave, and does not denote fabric content. Satin is woven from silk, polyester, acetate, or even blends of fibers. Today's mountaineering garments often feature pile weaves or fleece. Pile, sheared pile, and fleece combines plain weave with filling yarns drawn through the plain weave pattern to create loops, which may be sheared to finish the surface.

Some of the more technical outdoor clothing, from underwear to weather and wind-proof shells, use tight, complex weave patterns to create breathable, waterproof clothing. Fabric treatments are also a major player in garment construction. Factory applied water-repellent finish (DWR) causes the rain to bead up on the outer surface. These treatments are used to create stain resistance, enhance moisture wicking, increase resilience and reduce wrinkles. The treatment will wear off with use, but can be substantially restored with spray-on or wash-in products sold by manufacturers for home treatment.

COLOR can make a difference is comfort for you and in the visual impact for others. Most people remember that dark colors will absorb more heat than light colors when there is sufficient sunlight present. However, this characteristic has its low light alternative, which is often overlooked. Dark colors will radiate more heat than light colors during periods of low light. Wearing a black hat can both overheat you during the day and rob you of precious heat during dusk. You may want to consider a compromise color such as gray or tan.

SIZE is important primarily when your garment is either too tight or too loose. The better fit is on the loose side because it will allow a greater range of movement, your clothing will trap more warm air, and your blood flow will not be restricted.

Care And Cleaning

The expense and technical complexity of mountaineering clothes necessitates great care in cleaning and storage. Almost every garment comes with cleaning instructions, which should be strictly followed if not exceeded in the mildness of cleaning treatment. Detergent can be too harsh on some fabrics or can alter the physical water repellency character on many technical garments with waterproof treatment. As a result, some manufacturers offer their own or recommend certain non-detergent cleaners.

Machine washing may be indicated on the garment's label, but repeated machine washings and drying will change the feel and performance of most fabrics. If you like the way the garment feels and you're willing to invest a little time to maintain your investment, consider one of the non-detergent cleaner sold specifically for the type fabric.

You may want to hand-wash your clothes with the non-detergent cleaner. Just follow the directions on the bottle. Ask the sales person if they have ever used the product and consider their experiences and results before you use the cleaner on you clothing.

Hand-wash similar fabrics and colors, rinse thoroughly and check the label to see if you can machine dryer on low heat long enough to remove wrinkles and the surface water. Machine drying can stiffen, shrink or deteriorate many fabrics.

Home water and weatherproofing treatment is quite easy and relatively inexpensive. The fabric treatments range in cost from $10 to 15 dollars per garment per treatment. The treatment will last for several extended uses.

Other Thoughts
Here are some basic ideas on purchasing priorities

Safety	No Compromise
Destination	Where do you want to go? What's the terrain and weather condition?
Commitment	Are you in this for the long run?
Budget	Do you really need to own it?
Versatility	What else can I use it for?

The Short Answer to Clothing

Synthetic or wool clothing must always be worn. **Cotton is not acceptable**.

Items of Clothing needed for the Backcountry

Socks, heavy pair and liner pair, and extra set - Thin socks worn under outer socks will minimize friction and lessen the chance of getting blisters. Thicker outer socks will be warmer and more comfortable on your feet, provided that there is enough room in your boots. Thick socks pad the feet more and reduce the chance of getting blisters. For cold weather, you may consider chemical toe warmers. Be sure to test them in your boots at home before you use them in the backcountry.

Gaiters, long - Help keep your feet warm and dry by keeping rain, water, and snow out of your boots and socks. Full-calf gaiters are preferred.

Underwear, tops and bottoms - Lightweight synthetic required. Also, synthetic briefs (Capilene, etc.) will keep you *significantly warmer* and dryer. *In winter, you should always wear synthetic briefs!* Buying higher quality tops is more important than bottoms because the top covers the core body, and also because tops last longer than bottoms since they receive less wear and tear. High quality underwear should last for several years of outdoor activity. Mid-weight underwear is probably the most versatile weight, as it can be used in all seasons.

Pants or shorts - Lightweight synthetic or wool recommended. Wear over your long underwear.

Pants and shirt, second pair - Synthetic or wool recommended. Shirt should be long sleeved. Fleece pants are better than heavy wool for warmth. Side zips will allow you to put them on without taking your boots off in cold or wet weather, so you will be more likely to use them when you need them.

Sweater or jacket - Synthetic or wool recommended, thick enough to be your primary insulating layer for the upper body. Fleece is excellent (Polar Proof will make fleece water-resistant). Sweaters and jackets should be long enough to keep your waist covered when you bend over.

Hats - one for sun and one for warmth - and a bandana - Hats are essential to protect your head from the sun and from cold. "*If you get cold, put on a hat*" really works. Most of your body heat is lost through your uncovered head. If your feet are cold, wear warmer head-gear, or put on a sweater -- warming your head and torso will raise your body core temperature and thereby warm your extremities. A balaclava weighs very little and is nice to have for severe cold or wind. *Make sure the hat you use for warmth is made of synthetic material such as fleece -- Wind-Stopper* fleece is significantly warmer than other materials.

A cotton bandana is the one item of cotton you should carry. You can use it to dry yourself, wipe off sweat, or clean off your glasses. Wear it as a head band and look cool, wear it on your head for sun protection and look super cool. In an emergency, you can use it to make a bandage or sling.

Mittens or gloves - For the same thickness, mittens are significantly warmer than gloves - try to get mittens made of *Wind-Stopper* material (it's significantly warmer). Ideally, you should also carry waterproof overmitts or shells.

Don't wait until your hands are cold to put on mittens or gloves, because it takes an immense amount of heat and energy to re-warm them. If it is cold, wear mittens from the start; if your hands get hot, take them off for a while. Attach wrist loops to your mittens and gloves, so that when you take them off they are still attached to you by the loop. If you do not use wrist loops, put your mittens inside your coat rather than on the ground or snow. An extra set of cheap, light, synthetic glove liners are nice to carry for when your regular ones get wet. If you get cold easily, consider carrying a few packets of chemical hand warmers (available from most outdoor stores).

Rain and Wind Gear: This the second most important gear that you will carry, after boots.

Pants - Full side-zip models are preferred because you can put them on and take them off without removing your boots. This is especially important in cold or wet weather, or when you need to put them on and take them off repeatedly. They should be large enough to fit over all other layers.

Parka or jacket - Essential to stop rain and snow, and to prevent wind from robbing the insulating value of inner clothing. Must have a hood, and be large enough to fit comfortably over all inner clothing. Zip front parkas offer greater temperature control than pullovers or anoraks. Ponchos and cagoules don't work well in wind, and are cumbersome because they don't allow you to see your feet.

Equipment for the Backcountry

Day pack - Your daypack should be large enough to hold all needed items, at least 2,000 cubic inches. It should have a large waist belt, preferably padded, to comfortably transfer its weight to the hips and legs. A pack with a long, narrow shape will be more stable on scrambles and transfer weight to your hips better than a short, wide pack. You may line your pack with a plastic bag or use smaller plastic or nylon bags to keep your gear dry and organized. Stow extra clothing and survival gear at the bottom of your pack, and heavy items close to your back. If you plan to use your pack for winter trips, get one of 3,500 cubic inches or more, to allow room for additional clothing. If in doubt about size, take your gear to an outdoor store and test the pack, to make sure everything will fit.

Whistle or mirror - For emergency signaling. (3 blasts = “Help, I'm lost!”)

Pad, insulating - Most insulating pads are cheap, lightweight, durable, and versatile. A form pad will provide insulation and comfort as a seat during breaks or as a sleeping pad on an unplanned night out. It can also be used to splint injured limbs. Closed-cell pads won't soak up water. A 1/2" thick sit pad or 3/4 length pad is good for warm weather, full length is best for cold weather.

Toilet paper - Essential for personal sanitation. Carry a digging tool (plastic trowel, ice ax, etc.) in the summer for burying your waste. Bring Ziploc plastic disposal bags for carrying out used toilet paper and hygiene products, and dispose of them at home. On snow, also carry out your waste. See page 53 of this syllabus, *Wilderness Ethics*, for instructions on proper wilderness disposal of human waste.

Paper and pencil - Useful for marking maps, recording elevations, times, route descriptions, names, and for completing accident report forms or recording rescue information.

Optional Equipment

Camera, binoculars – Cameras are popular pack items because hiking and backcountry travel provides many opportunities for scenic photographs. Binoculars can be used to check possible travel routes or watch wildlife.

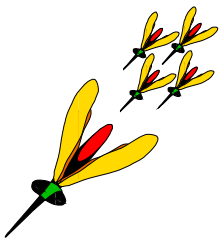
Altimeter - An altimeter is helpful in estimating where you are, especially while on trails or near natural features like ridges or streams. Usually, at least one person in a hiking party will have an altimeter.

Trekking poles - You may want to carry one or two trekking poles to aid your ascent and descent when the terrain is not steep enough to require an ice ax. Several studies have suggested that using trekking poles while hiking reduces stress on the knees. Old ski poles are a cheap alternative, but they don't adjust or collapse for safe storage as most trekking poles do.

Camp stove – occasionally there may come a time when a stove's ability to heat water for emergency use or simply for cooking dinner is indispensable. Although rarely carried on day trips, the camp stove is essential for a backpacking trip and overnighter. Often one stove will meet the needs of 2 to 5 people, depending on the availability of running water (more stoves are needed if snow must be melted) and the amount of water needed. Generally white gasoline is used in liquid fueled stoves and Butane/Propane mix is used in stoves fueled by pressurized gas canisters. Each has advantageous and special safety considerations.

Water purification tablets or filter - You may want to carry purification tablets or a water filter or purifier, especially on hot days or overnight trips. *Don't plan on finding water sources on a day trip unless you're sure there are plenty on your route.* Purification tablets cost and weigh much less than filters or purifiers. Water purifiers kill viruses; water filters do not, but filters usually cost less than purifiers and are adequate for use in the wild. Purification tablets and iodine-based purifiers give water a chemical taste, which is harmless but unpleasant to many people.

Insect repellent - many people don't like using repellents, but you should carry some in case you absolutely need some - which eventually will happen in the mountains. Insects are very seasonal in the mountains, but at certain times, you may consider insect repellent an emergency need. The most effective repellents contain DEET. Repellents are available with DEET concentrations up to 100%, but according to *Consumer Reports*, concentrations above 50% do not increase effectiveness. Most repellents are harmful to synthetic materials (nylon, etc.), so don't use it on synthetic clothing or equipment.



Pack rain cover - A pack rain cover will help keep your pack and the gear inside it drier in the rain, and lighter (wet items are heavier). A heavy-duty trash bag with shoulder-strap slits cut in it will also work. You may want to use a large plastic bag to line your pack, then put all your gear inside the bag, so the gear inside will stay dry without a pack cover. The large plastic bag can also be used for an emergency bivy sack. (So can your pack.)

Avalanche rescue beacon (transceiver) - If you hike in the winter, or snowshoe or backcountry ski, you'll eventually want to get an avalanche rescue beacon. Rescue beacons are required on some winter hikes. (Only course graduates may sign up for *The Mountaineers'* winter scrambles.) Although expensive, an avalanche beacon could save your or another's life. Before purchasing one, you should take a course that teaches you how to use one. Many outdoor stores, commercial courses, or *The Mountaineers'* Snowshoe Course can provide instruction.

Snow shovel – When traveling in snow during avalanche season, all party members should carry a shovel. Shovels are used to build snow shelters, dig out tents, dig pits or snow break platforms to assess avalanche conditions, and - most importantly - for avalanche rescue. In hard snow, aluminum shovels work better than plastic. When digging, don't pry - you'll break any lightweight shovel. Use the shovel to cut loose the snow, then scoop it out. Shovels with extendable handles are easier to use, and removable handles pack better. Wax the blade before a snow trip to prevent snow from sticking to it and increase the shovel's effectiveness.

Friends - It is always safer to be out there with others, especially when venturing off-trail or on snow, in case of an accident, injury, major equipment failure, or becoming lost. Hiking with others allows you to share good times, and learn from each other. *The Mountaineers* Climbing Code requires a minimum party of three for backcountry trips. (See page 48.)

Dry clothes in car - After a hike, you may feel too tired and worn out to change your clothes. But if you do, you'll feel so much better! Guaranteed! You won't continue to lose energy trying to heat your body in wet clothes. Your partners will appreciate how much better you'll smell; and if you go out to eat afterwards, the restaurant staff and patrons will also appreciate it. You'll notice that most experienced hikers change some clothing after their hike.

When carpooling, always take along an equipment bag or garbage bag to hold your muddy/wet boots and clothing after a trip. Some drivers in a carpool can be very concerned about dirt in their car. And there will be less lost/misplaced equipment at the parking lot if all your stuff is in one bag, as opposed to spread over the trunk or back seat.

Other Helpful Items

- Identification
- Trowel With Plastic Bag
- Stuff Bags
- Watch
- Extra Car Keys (To Give Someone Else On Trip In Case You Lose Yours.)
- Personals (Extra Eye Glasses, Eye Lotion, Tampons, Personal Medications, Medic Alert Tag.)
- Wilderness Permit
- Book (Nature Guide, Etc.)
- Photocopy Of Guidebook Page Describing Trip & Driving Instructions.
- Fishing Gear & License
- Pot Gripper Or Hot Pad
- Lightweight Thermos
- Bio-Degradable Soap And Scrubby
- Hand Towel
- Candle Lantern
- Plastic Bag (For Shoes/Boots To Keep Vehicle Clean)

Clothing Equipment		Estimated Cost Range	
		Standard Items New	Used-Sale-Homemade
Ten Essentials	Illumination (flashlight extra bulb and batteries)	$15 - $95	$2 - $10
	Navigation (map and compass)	$20 - $100	**Not recommended**
	Hydration (water)	$10 - $75	0 - $5
	Nutrition (extra food)	$1 - $30	$1- $10
	Insulation (extra clothing)	$18 - $100	$5 - $25
	Sun Protection (sunglasses and sunscreen)	$15 - $110	$10
	Repair Kit and Tools (knife)	$10 - $85	$2 - $20
	First Aid Kit	$10 - $50	$10- $20
	Fire (waterproof matches and fire starter)	$4 - $25	0 - $5
	Emergency Shelter	$5 - $250	$1 - $30
Winter Clothing	Wicking long underwear (top & bottom)	$20 - $80	No Thanks
	Wool/Fleece Pants (Insulation)	$25 - $75	$5 - $25
	Wool/Fleece Shirt (More Insulation)	$20 - $60	$5 - $20
	Wool/Fleece Sweater (More Insulation)	$20 - $60	$5 - $20
	Wool/Fleece Hat/Ear Covers (Insulation)	$10 - $25	$3 - $10
	Wool Socks (with liners)	$10 - $35	No Thanks
	Mittens (Insulation)	$25 - $55	$10 - $20
	Over Mitts – Waterproof (Shell)	$25 - $55	$10 - $20
Summer Version	Wicking underwear (bottom)	$18 - $30	No Thanks
	Nylon/Polyester Walking Shorts or pants (Shell)	$18 - $65	$5 - $15
	Polyester Shirts long/short sleeve (Wicking/Insulation)	$18 - $65	$5 - $15
	Light weight hat – sun and weather protection	$18 - $65	$5 - $15
	Fleece Vest (lighter 100 or 200 weight)	$18 - $65	$5 - $15
	Light-weight hiking jacket	$40 - $80	$2 - $10
Year Around	Gloves, Preferably Wool/Fleece	$19 - $85	$5 - $20
	Boots - Lug Sole – Steel/Fiber Shank – Ankle Support	$150 - $350	Hard to find $50+
	Parka Waterproof-Breathable (Shell)	$100 - $300	$5 - $30
	Pants Wind/water resistant (Shell)	$30 - $90	$20 - $40
	Rain Gear (coat and pants) (if Parka not suitable)	$30 - $55	$10 - $25
	Wind Breaker (if Parka not suitable)	$45 - $125	$10 - $30
	Gaiters (Shell)	$25 - $55	$5 - $25
	Belt or Suspenders	$8 - $20	$2 - $5
Food	Meal with sufficient nutrition and energy for the day	$5 - $15	← Get it fresh
	Snack easy to access, healthy and interesting	$5 - $10	← Get it fresh
	Electrolyte Mix to replenish loss	$5 - $10	← Get it fresh
In Car	Leave a set of dry clothes and shoes in the car	$ 0	$ 0
	Wallet, keys for your car, snack for the trip home	$ 0	$ 0
	Some way to call home - they may be interested	$ 0	$ 0

Day Trip Equipment	Clothing Equipment	Estimated Cost Range	
		Standard Items New	Used-Sale-Homemade
	Lunch, snacks and/or other meals	$5 - $15	← Get it fresh
	Ski/Trekking Poles	$50 - $110	$10 - $25
	Summit Pack	$70 - $210	$30 - $70
	Water Containers with water	$5 - $15	$0 - $10
	Seat Pad	$5 - $50	$0 - $5
	Toilet paper – blue bags and re-sealable over bag	$1- $3	Use what you have
	Add from Useful Items List	Priced as sold	Less – but as needed

Overnight Equipment	Clothing Equipment	Estimated Cost Range	
		Standard Items New	Used-Sale-Homemade
	Large Overnight Pack	$100 - $425	$50 - $100
	Sleeping Bag	$100 - $200	$25 - $100
	Insulating Pad	$25 - $55	$3 - $15
	Backpack Stove and Fuel	$40 - $100	$8 - $35
	Cook Kit Cup	$20 - $60	$5 - $25
	Utensils and other Tools	$1 - $40	$0 - $3
	Kitchen cleanup	$5 - $15	$1 - $5
	Tent – Fly – Ground Cloth	$120 - $450	$50 - $180
	Water Filter (or treatment)	$12 - $110	**DON'T SKIMP $8+**
	Camp Shoes (light comfortable)	$20 - $60	$3 - $10
	Personal hygiene (compact / light)	$12 - $40	Use what you have
	Pillow (or substitute)	$8 - $15	$0 - $5
	Cord or rope for general camp purposes	$2 - $8	$1

Very Useful Equipment for Any Occasion	Clothing Equipment	Estimated Cost Range	
		Standard Items New	Used-Sale-Homemade
	Use Permit	$4 - $50	← Buy it Don't cheat
	Personal Items Identification – Money – Eye Glasses	$2 - $25	Use what you have
	Toilet paper – blue bags and re-sealable over bag	$1	Use what you have
	Insect Repellent	$2 - $10	← Get it new
	Watch	$5 - $100	Use what you have
	Bandana – Handkerchief - Towel	$2 - $10	No Thanks
	Neck Gaiter (scarf)	$8 - $20	$1 - $5
	Camera and Film	$12 - $$$$	$10 - $$
	Note Pad, Pen and Pencil	$1 - $5	$0 - $2
	Repair kit	$8 - $30	Use what you have
	Trowel	$2 - $8	$1 - $3
	Nylon Cord	$5 - $10	Use what you have
	Stuff Sack	$5 - $25	$1 - $5
	Trash-Litter Bag 2+	$1	Use what you have
	Emergency shelter	$10 - $125	$2

How to Choose a Daypack

For any activity that involves more gear than you can carry in your pockets — hiking, climbing, a full day at school – you can find a daypack that will make the experience more efficient and better organized. Images from *Outside Magazine*.

Panel Loader or Top Loader?

Panel-loading daypack

Panel-loading daypacks offer a main storage compartment that is accessed via a U-shaped zipper. Fully opened, one sidewall (or panel) of the compartment falls away like a flap.

Such a wide opening makes panel loaders easier to load and rummage through when you're searching for something. This makes them particularly appealing for students, parents or trip leaders. If organization is important to you, consider a panel loader.

Top-loading daypacks generally are simpler in design and a little lighter than panel loaders of a comparable size. (Zippers and extra compartments add ounces.) Top loaders, which usually close with a drawstring, are also easier to overstuff when needed.

Some top-loaders offer a "floating" (extendable) top lid that creates space for extra gear so you can exceed the pack's stated capacity. This is valuable to climbers who may need to carry a lot of gear during the approach but don't want to climb with a larger volume pack once most of the contents (rope, rack, shoes, helmet) are in use.

Top loaders with side compression straps also do a nice job of stabilizing a load, making them appealing to climbers, scramblers and skiers.

The downside? Organizing and locating gear in a top loader can be a challenge. Something important, it seems, always migrates to the bottom of the pack.

A few daypacks offer dual access points—top and panel. That's a handy option.

What's the Best Size?

The sweet spot for most hiking and multisport daypacks is 30 liters (roughly 1,800 cubic inches). That's enough capacity to hold the 10 Essentials plus some extras.

Some specialized packs lie at the far ends of the daypack-capacity continuum. A trail-running pack may be designed to hold as little as 10 liters (600 cu. in.). A climbing pack may hold 40 to 50 liters (around 2,400 to 3,000 cu. in.).

Are you often a trip leader? Someone who carries extra gear for other members of your family such as small children? Look for a pack in the 40-liter range—perhaps even larger.

In most cases, though, packs with capacities at or near 30 liters are a popular choice for a typical day hike.

Match Your Pack with Your Activity

If you day hike in the summer and ski tour in the winter, you may want more than one daypack to accommodate both activities. If, however, you'd prefer a single, do-it-all pack, evaluate your ambitions and expectations. Images from *Outside Magazine*.

For example, will your pack get as much use (or more?) at school as it will on the trail? Then steer yourself toward a larger-capacity book bag. Plan to do some scrambling during some of your hikes? Consider packs with narrower profiles so your arms have room to swing freely.

Day hiking: The following attributes or features are often preferred by day hikers:

- an adequate capacity, typically 30 liters
- side pockets (usually elasticized mesh slots that lie flat against the pack-wedge an item into place)
- compartments (slots or pockets) for organizing small items and loose gear
- hydration-system compatibility

Scrambling/climbing: Choose a narrow-profile pack, perhaps one that includes a padded back or a framesheet. Often you'll be climbing to higher elevations where the air is cooler, so you'll need a capacity of 40 liters (about 2,400 cubic inches) or so to hold extra clothing. Your ambitions will determine whether you need a lower-capacity multiday backpack or a large technical daypack. Compare your standard equipment load (ropes, carabiners, etc.) with the list of specialized features a pack may provide (ice axe loop, crampon patches, daisy chain). A variety of load-stabilizing compression straps and a sternum strap are also valuable. Ask your climbing companions what features work best for them.

Ski touring: A smooth, narrow profile is a plus. Your range of travel (and the extra clothing you usually carry) will determine your capacity requirements. Look for a means to attach your skis to the pack and a secure place to keep your shovel and probe handy. A sternum strap and hipbelt are essential. Climbing packs often work very well for backcountry touring.

Trail running/adventure racing: A lumbar pack, water-bottle pack or small technical daypack (at 25 liters or less) are all good choices. Lumbar packs (also called waist packs) are less inclined to shift while you run, and it's nice to keep your back clear so perspiration can escape.

Overnighters: If you have a minimalist's mentality and the gear to match it (a teeny sleeping bag; a bivy sack or similar next-to-nothing shelter; and so on), a technical daypack can handle an ultralight overnight load. Typically, packing with such efficiency is a talent of an elite few. Newcomers to the ultralight scene are probably better advised to go with an ultralight multiday pack.

You may want to look for a pack that offers a padded back (or some type of framesheet) to help support a load, a modest lumbar pad and a padded (though not necessarily beefy) hipbelt. Some models offer one or two aluminum stays to accommodate a heavier load. The more amenities you crave, of course -- even during an overnight trip -- may push you into a larger multiday pack.

Ventilated Back Panels

This relatively recent design feature uses lightweight framing (or other engineering techniques) to suspend the load away from your back. The result: A steady flow of air can reach your back. This delivers a big bonus in comfort when carrying a pack on warm days. Packs from Gregory, Osprey and Deuter are among the first packs to offer this innovation.

Note: If you routinely carry bulky or heavy loads, these packs may not be your best choice—a heavy load suspended away from your body could affect your balance. If you are shopping for such a pack at an REI store, try loading it with some weight and take a test-stroll around the store to gauge how it carries.

What Makes a Quality Daypack?

Many stores sell backpacks. So which is a better value: A bargain pack from a department store or a well-engineered technical pack? You may wonder: "A daypack is a daypack, right? It's a sack attached to a couple of shoulder straps. How different can they be?"

You'll initially save money with a bargain pack, but you'll likely miss out on design refinements found in top-brand packs that deliver better performance, convenience and comfort. Such as? Well, to name a few:

- **Padding, support and shaping:** Shoulder straps and, on some models, scapula pads, offer plusher padding and great longevity in comfort; some packs include shaped bottoms or structured back panels to prevent loads from sagging, keeping items closer to your back.
- **Women-specific designs:** Shoulder straps are contoured to comfortably conform to the female form; some offer narrower profiles.
- **Tougher fabrics at lighter weights:** Discount packs commonly use weightier fabrics purchased in bulk to cut costs; more sophisticated packs may use a rugged 630-denier nylon that offers superb durability at a noticeable weight savings.
- **Ventilated back panels:** Mentioned previously.
- **Sustainable fabrics and materials:** An emerging trend already seen in packs such as the Osprey React.
- **Water-resistant zippers:** Eliminates storm flaps, saving weight and creating a cleaner look. Many times these zippers are welded, or glued, in place. This eliminates stitching, increases watertightness, boosts strength and further reduces weight.
- **Waistbelt pockets:** Handy for keeping small items (gel packs, for instance) within easy but unobtrusive reach.
- **Hydration system compatibility:** Some packs include sleeves for a hydration reservoir; most offer a port for a hydration hose.
- **Tool loops and daisy chains:** External attachment points for an ice axe, crampons, climbing gear, trekking poles.
- **Small but useful nuances,** including:
    - Padded back panels
    - Media pockets, even earbud holders
    - Laptop slots or sleeves in school, commuter or travel packs
    - Organizers and keyholders

Contributor: Terry Wood, REI Expert Advice editor

Purchasing Clothes and Equipment

Expen$e$

Wilderness travel requires a fair amount of equipment, including a pack, sturdy boots and outdoor clothing. If you are not already well equipped for hiking in the Pacific Northwest, it can be expensive to outfit yourself. If you want new, top-of-the-line gear, you could easily spend $1,000 or more.

Fortunately, there are many options available if you are on a tight budget. We will provide information throughout the course on what equipment and clothing you will need. But take no one's advice as absolute. It's ultimately YOUR choice to determine what's best for you.

Here are a few tips for saving money:

USE THINGS YOU ALREADY HAVE ON HAND. Most everyone has a few items at home that are adequate for hiking - - - wool clothing, first aid supplies, hats, mittens, sunglasses, etc.

BORROW FROM A FRIEND OR RELATIVE WHO HAS THE GEAR. With the ever-increasing numbers of hikers, you shouldn't have to look far to find someone who can help you. This is a good way to find things like ice axes, maps, gaiters, rain gear, packs, or stiff mountaineering boots. Make sure though that the equipment is reliable and fits properly.

RENT. Most local outdoor shops rent packs, ice axes, mountaineering boots, and other outdoor equipment. These items are usually around $5 - $10 each per day. This is an excellent way to try out major items before purchasing them. Be sure that you don't wait until the last minute to rent because most stores have limited supplies, and demand on weekends is VERY high.

BUY USED EQUIPMENT. There are several second-hand sporting and outdoor shops in the area (see list at end of the section). Thrift stores, surplus stores, and even garage sales are also great places to check.

The Mountaineers **Gear Grab.** The Olympia Mountaineers generally host a Used Equipment Sale in February to help students find useful equipment at affordable prices. Other branches also host used equipment sales throughout the year such as Seattle *Mountaineers* “Gear Grab”, where members sell their used equipment in a flea market setting. **Look for the next Gear Grab in the January or February *Go Guide* newsletter.** Additional information on gathering, purchasing or borrowing the necessary equipment for this course can be found at the end of this section.

In the South Puget Sound area, several excellent outdoor stores offer students in the Mountaineer’s Courses good equipment at good prices. (See following list.) The owners and staff at each site are very knowledgeable about the kind of equipment that works best in our environment. They climb too. Based on the comments they received from earlier students, they know the successes and failures of the equipment and can probably tell you how it will work for the applications you have in mind. These stores are a great resource for outdoor travel students and your patronage is mutually beneficial.

Purchasing your equipment is educational and enjoyable. During the process you will learn why and how each piece of equipment can be used to its maximum potential. In the alpine environment, you will want dependable, quality equipment. Since you will be carrying it on your back, you’ll want light-weight items that have multi-functions, such as waterproof stuff sack that you can fill with clothes for a pillow or seat cushion, or carry water in an emergency, or . . . You will also want to become familiar enough with your equipment to make minor repairs if necessary.

If you’re looking for bargains, you need to know a lot about the item before you buy it. You should be familiar with quality materials, workmanship, and long-standing manufacturers who back their products. Buying

equipment on sale can be fairly easy once you know brands and products you are willing to trust. Watch for sales, generally at the end of the season is the most common times for sales. Buying used equipment can be tricky. You may not recognize the manufacturer, the style and the original condition of the equipment. Look for damage, or wear. Discuss its features. Try to get the original manufacture's product literature. Test it out. Ask if you can return it undamaged if you're not satisfied with its performance.

Here are a few tips to help you organize your purchases for economy and necessity.

- Make a list of equipment you need in priority order.
- Carry the list and make notes on the products you like.
- Check out other folk's gear. Those who have been around for a while can tell you a lot about why they like their equipment for what they would purchase if they needed to do it over again.
- Mark your calendar with dates of sales, used equipment sales and upcoming hikes.
- Become familiar with equipment and prices while visiting at local outdoor stores, in catalogues or at web sites of various manufacturers.
- Check out catalogues or web sites of wholesaler such as, Sierra Trading Post and Campmor.com.
- Try the club ***Gear Grab*** or ***Used Equipment Sales.*** It's not likely that your fellow club members will offer unreliable clothing or equipment.
- Visit ~~used~~ experienced clothing and furnishings stores. You're sure to find a bargain if you know quality equipment and can tell its condition. You will probably have a week or more to try it out and be sure it meets your needs.

Cheap gear on line

- www.gearengine.com
- www.steepandcheap.com

Equipment - Where To Get It?

New Equipment & Clothing - The "mountaineering" stores listed below sell quality equipment suitable for hiking and mountaineering. Based on the experience of the Hiking and Alpine Scrambling Committee members, the highlighted stores are local and offer experienced and knowledgeable staff available to give advice and recommendations. (These lists are not intended to be endorsements.)

Store	Type	Phone	Address	City
The Alpine Experience	**Mountaineering**	**360-956-1699**	**408 Olympia Ave**	**Olympia**
Backpacker's Supply	Mountaineering	253-472-4402	5206 S Tacoma Way	Tacoma
Big Five Sporting Goods	**General Outdoors**	**360-786-6529**	**1001 Cooper Point Rd**	**Olympia**
Bill's Blueprint	Compasses	425-259-0859	2920 Rockefeller	Everett
Cabelas'	**Outdoor plus**	**360-252-3500**	**1600 Gateway Blvd NE**	**Lacey**
Feathered Friends	Mountaineering	206-392-2210	119 Yale Ave N	Seattle
Great Pacific Patagonia	Clothing	206-622-9700	2100 1st Ave	Seattle
JanSport Outlet	Packs/equipment	425-353-0200	10411 Airport Road	Everett
Marmot Mountain Works	Mountaineering	206-453-1515	827 Bellevue Way NE	Bellevue
McHale Packs	Packs	206-281-7861	29 Dravus St.	Seattle
Mountain Safety Research	Mountaineering	206-624-8573	4225 2nd Ave S	Seattle

Store	Type	Phone	Address	City
North Face	Mountaineering	206-622-4111	1023 1st Ave	Seattle
Olympic Outfitters	**General Outdoors**	**360-943-1114**	**407 E. 4th Avenue**	**Olympia**
Outdoor & More	General Outdoors	800-460-5939	510 Westlake Ave N	Seattle
Outdoors Northwest	General Outdoors	360-794-8100	19551 State Road 2	Monroe
Proguide & Mountain Supply	Mountaineering	260-528-7515	8954 Aurora Ave. N	Seattle
Recreational Equipment Inc.	Mountaineering	206-233-1944	222 Yale Ave. N	Seattle
Recreational Equipment Inc.	Mountaineering	425-882-1158	7500 166 Ave NE	Redmond
Recreational Equipment Inc.	Mountaineering	206-774-1300	4200 194th St SW	Lynnwood
Recreational Equipment Inc.	Mountaineering	206-941-4994	2565 S Gateway Center	Fed. Way
Recreational Equipment Inc.	Mountaineering	206-248-1938	240 Andover Park W	Tukwila
Sportsman's Warehouse	**General Outdoors**	**360 459-5800**	**1220 Marvin Road NE**	**Lacey**

Rental Equipment

Some mountaineering and backpacking equipment may be rented: boots, helmets, sleeping bags, packs, ice axes, gaiters, tents, etc. Most major outlets rent; check with The Alpine Experience, Olympic Outfitters, REI, Wilderness Sports, and Backpacker's Supply.

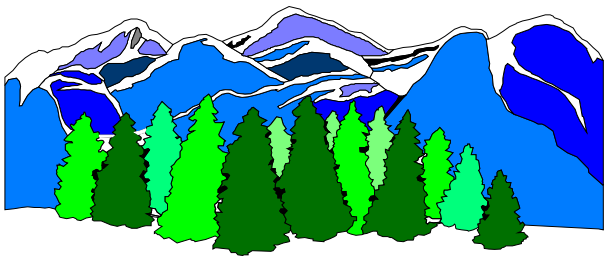
Many outdoor stores sell their used rental equipment at reduced prices; e.g., The Alpine Experience, Olympic Outfitters, Marmot Mountain Works, Wilderness Sports, REI*. Know what you want when you buy, because you may not be able to return used items.)*

Equipment/Clothing Repairs -

Dave Page, Cobbler	Boots	206-632-8686	3509 Evanston Ave N	Seattle
Northwest Garment	General	206-545-8683	4250 Fremont Ave N.	Seattle
Rainy Pass Repairs	General	206-523-8135	5307 Roosevelt Way NE	Seattle

Wilderness Ethics

As the wilderness becomes more heavily used, it is important for each of us to learn and practice minimum impact skills. We must, or someday there won't be any wilderness for us to enjoy and appreciate. As "knowledgeable *Mountaineers*", we have a special responsibility to be examples for other less-knowledgeable back-country travelers. *The Mountaineers* take wilderness ethics seriously.

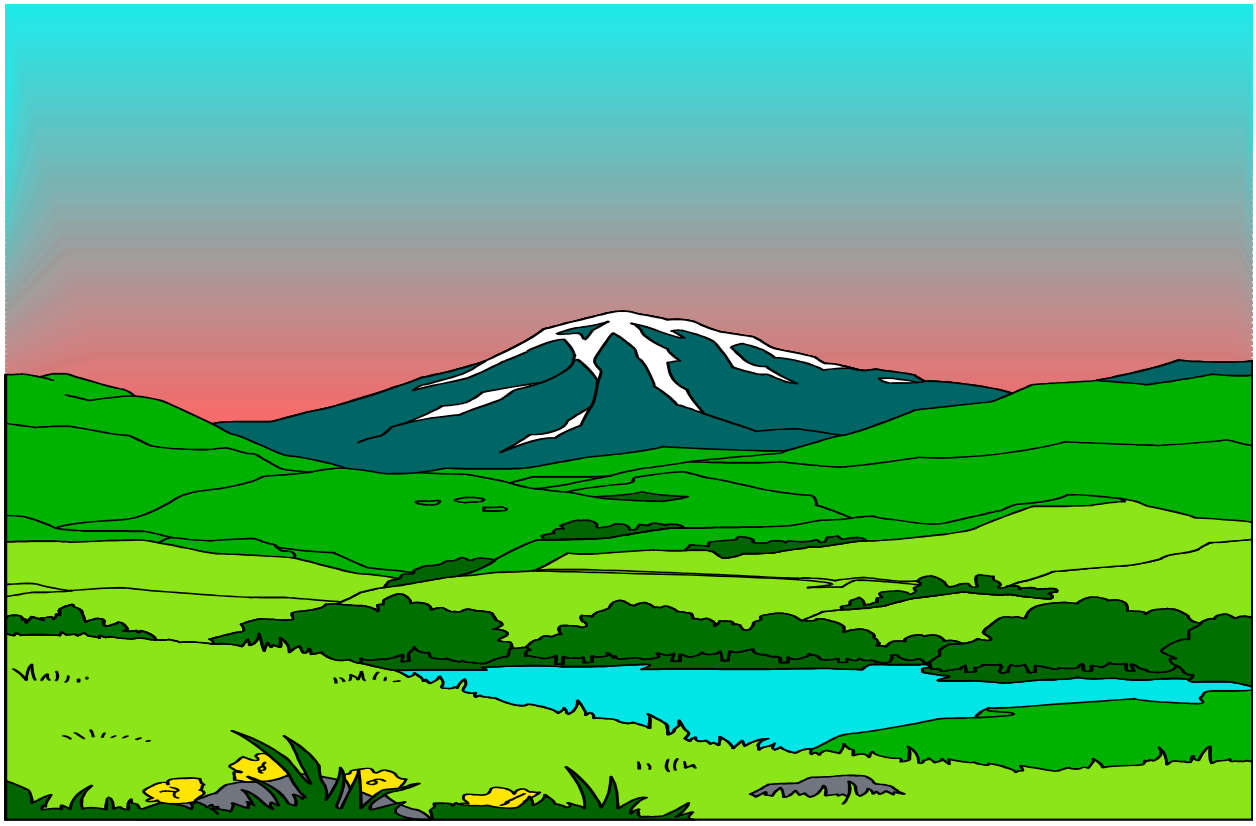


Wilderness Ethic Guidelines

The popularity of hiking, backpacking, backcountry skiing, and climbing grows each year. Competition for space and solitude increases. Soil, plants, water, wildlife and scenery bear the brunt of the seasonal onslaught. Litter, pollution, erosion, and noise increasingly scar the wilderness we seek to enjoy.

When we step from the car and onto the trail, the protective asphalt is left behind us. Our attitude and actions must change to conform to the fragile surroundings we're visiting. A backcountry ethic must take hold.

We're obligated, as backcountry users, as Mountaineers, to help sustain the illusion of solitude and the illusion of being first. Most of us are sensitive to the obvious--no littering, no polluting, no tree or trail cutting. The land, however, demands more of us. We must learn how to minimize our impacts even more. We may have to work at it, but only until it becomes second nature, just like learning to take the proper equipment into the backcountry.



Minimum Impact Skills – Leave No Trace

Protect The Water Supply

Human activity should be dispersed away from water supplies to keep them unpolluted. **ALWAYS CARRY WATER AWAY FROM THE SOURCE TO USE IT:** never wash dishes or bodies directly in the source. By doing these chores away from shore (i.e. 200 feet), you allow pollutants to be filtered out by the soil. Remember that even though "biodegradable" soap is preferred over regular soap, it is still a pollutant.

Dispose Of Human Waste Correctly

Use available facilities before you leave on a trip and watch for opportunities to use established latrine while hiking. Don't be uncomfortable or modest when you "need to go" - - it's natural and something that we all must do. In hiking, we simply ask the leader to “take a party separation", leave the group. and go do your thing.

Personal Sanitation. Male hikers need to recognize that while it may be easy for them to take care of personal sanitation needs, it is not easy for women to do so in the back-country, particularly in mixed groups, and even more difficult in "open" type country. Men and women must coordinate this activity, and allow everyone adequate time, privacy, and respect. Nothing makes a trip more unpleasant than needing to "take a party separation", but not doing so.....or even worse, not drinking water so that you won't need to take a party separation!

In the field, disperse your impact by using scattered sites, which will biodegrade the waste more quickly than will a group site. Always choose sites far from any trail, campsite or water source (200 feet or more). For solid waste, dig a "cat hole" (6" to 8" down) to get into the "biological disposal" layer, and then cover with topsoil; pack used toilet paper and tampons back out in plastic bags (zip-lock) and dispose of at home.

When there's snow on the ground, never bury your waste. No matter how deep you dig, when spring comes, the snow will melt and your un-decomposed waste will be there for all to see. Bring supplies for carrying your waste back out: use double zip-lock plastic bags inside of a larger plastic bag. Containerize your solid waste using the same technique as urban dog walkers: put a inverted sandwich bag over your hand like a glove, grasp the waste, pick it up, then turn the baggie other-side out and seal it. Pack it out with you! Dispose of the waste at home by dumping it out of the bag into a toilet. Double bag the dirty bag and put it in the trash, not in the toilet.

Pack It Out

If you brought it in, you should take it out. This includes everything from paper and cans to biodegradable food items including apple cores and orange peels. Burying trash and garbage is not satisfactory, for animals will often expose the debris. Take a trash bag with you on all trips. Pick up trash you find; leave the wilderness cleaner than you found it.

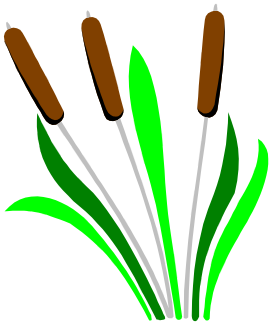
Litter life

- Paper 2-5 months
- Orange Peels 6 months
- Plastic Containers 20 years
- Cigarette butts 10-12 years
- Plastic bag 10-12 years
- Nylon cloth 30-40 years
- Aluminum 80-100 years
- Plastic foam doesn't decompose

Travel With Care

Your boots are potent weapons for wreaking havoc on the environment. While the damage done by one pair may be slight, the effect of dozens or hundreds can be devastating. Extreme care is necessary in the fragile alpine meadows at higher elevations. For minimum impact, it is better to walk on snow or rock, instead of vegetation. Remember that if you are not walking on a trail, you want to keep a new one from developing.

Travel in small groups, share equipment; don't overwhelm others (people or animals) trying to seek solitude. Plan your trip and carpool. Leave natural features undisturbed. Hiking can do considerable damage to fragile alpine ecosystems. To minimize damage:



On Trails: When possible, keep on established trails. Do not cut switchbacks. Walk single file to protect trail-side vegetation. Stay on the trail even if it's muddy or rutted. Trails widen when hikers walk around mud or other obstacles on the trail. The result is more mud and a wider trail.

Off Trails: When traveling cross country, spread out and avoid creating new trails. Try to walk on snow or rock, and avoid fragile meadows. Leave areas without trails free of cairns and flagging unless they are already there. Let others have the same adventure of route-finding that you experienced. If you need to mark your route, remove the markers when you leave.

CAMP SELECTION

In areas where there are established campsites, use the existing campsites. The idea is to prevent damage to areas that have not already been sacrificed. When an area lacks established sites, you want to keep new sites from developing. Try to stay off fragile vegetation, and move your site every couple of days to help the plants to recover. If you encounter a site that has just been used, give it a chance to recover. Never engage in "engineering projects"; such as digging a trench around you tent. Instead, choose a site that does not require such projects. Finally, camp at least some distance from water sources.

Campfires

A backpacking stove is really the way to go for minimum impact camping. Roaring campfires are too hard to justify, because of the long-term damage done to the entire environment: soil, plants and animal life and even the air. If you find you really must have a fire, use established fire rings (it keeps from sterilizing a new patch of soil) burn only dead and downed wood, and make sure that the fire is completely out before you leave. Many areas are closed to open fires so check with the ranger station prior to your trip.

Be Unobtrusive

Try to travel in small groups, which create less noise and do not overwhelm others trying to seek solitude. Use equipment that comes in minimum impact colors (dark green, brown, dark blue). Remember that many areas have minimum party size limits.

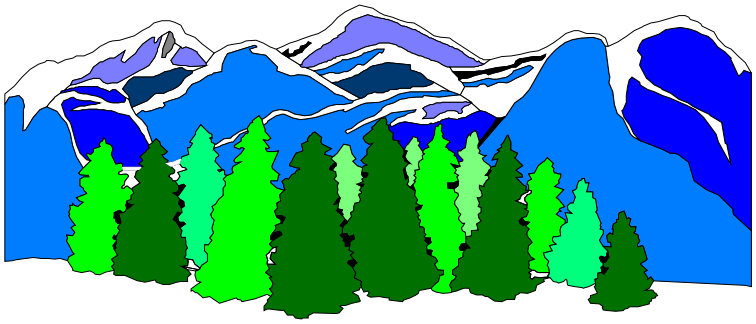
Do Not Disturb Animals

Observe, enjoy and appreciate them, but always keep your distance from them. Realize that you are a visitor in their home! Not only can animals not control their "guests", but animals have nowhere else to go. As we continue to impact their environment more and more, we need to treat animals and their homes with increased care and respect. You should not feed animals; the chipmunk (or bear) that you feed may quickly learn to associate food with humans and eat holes in your expensive packs and tents to get to your ("their") food.

Minimum Impact

Minimum Impact (Leave No Trace) information and materials are available at Forest Service and Park Service ranger stations. You can also call the Leave No Trace "hot line" 1-800-332-4100 for free materials and information.

Stewardship



A Generous Spirit for service to the forests, mountains, trails, wildlife and waterways of our natural world.

The incredible trail system throughout our beautiful Pacific Northwest needs continuous attention, in part, because of use by outdoor organizations like the Mountaineers. Each year the Olympia Branch of The Mountaineers trains over 200 students in backcountry travel, requiring a minimum of 3 trips and often as many as 10 trips on trails in parks, forests and wilderness area. Couple the student trips with the outings of over 700 members and the Olympia Branch accounts for hundreds of hiking/climbing days on backcountry trails.

The Mountaineers is one of the nation's oldest and strongest advocates for the preservation of our federal and state lands for human powered travel. For decades Mountaineers have testify on the need to protect and increase access to public lands. Because of the additional management requirements of increased access and shrinking budgets, land managing agencies now need help. It follows that those organizations, which champion for and use the outdoors for their own benefit, should have a similar enthusiasm for the upkeep of the trails and public lands and for volunteering for a Stewardship Project. There are several returns to be gained from the time invested in helping to maintain our trail system and volunteer Stewardship projects.

- Stewardship provides an opportunity to give back to the land for all the personal enrichment received.
- Stewardship is an extension of Wilderness ethics. It's the next step beyond Leave-No-Trace by taking action to restore our natural world.
- The trails are in better condition when needed.
- You may gain additional outdoor skills, leadership training, conditioning and camaraderie as a by-product of your service.
- Stewards enjoy the experience and receive a sense of accomplishment and personal fulfillment from good deeds.
- You may uncover a hidden spirit for volunteer service in the outdoors.
- Most land managing agencies provide a pass for free access or entry for a minimum number of hours of volunteer service.

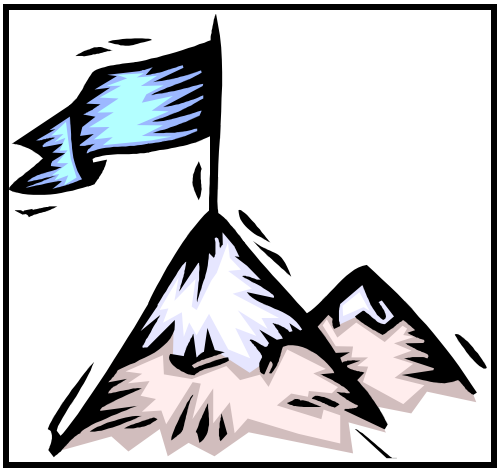
In 2003, the Olympia Branch adopted the special ***Frank Maranville Memorial Stewardship Award*** in honor of one of our branch's most notable and dedicated Conservationists and Backcountry Stewards, Frank Maranville who passed away in 2001. The award is given annually to recognize those branch members who have taken a leadership role in helping to protect and preserve our natural world.

The branch also adopted a Stewardship Award (shown to the right) to be given to any branch member who completes 12 hours of stewardship, in a single year, to help protect, preserve and enhance our trails, waterways, forests, wildlife, atmosphere or other part of our environment.

Trail Maintenance as you travel

If you use and enjoy wilderness and backcountry travel, it may be important to you to "pitch in" for the enjoyment you receive. You can contribute as you hike along. Here are a few simple but helpful practices that contribute to the health and safety of our trails and wilderness areas.

- Remove fallen branches from the trail; scatter them on the downhill side.
- Move rocks off the trail as needed, especially those over six inches in diameter.....***but do so only if you won't endanger anyone below you.***
- Drainage problems cause the most damage to trails. Use your boot heel to drain puddles. If the trail has become a stream bed, go to the source and remove the debris from the natural water course.
- Report major washouts, blow-downs, missing trail signs, and mud wallows to the district ranger station. Leave a note at the trailhead on your way home or call the ranger station the next day.
- Sign up for work parties. Un-maintained trails disappear. Spend a day preserving our environment. Give back to Nature for some of the enjoyment and pleasure that you have received from your outdoor trips.



Mountain Health & Safety - hypothermia, giardia, safety, blisters, etc.

Hypothermia can be a problem even on a day hike. If you are not wearing enough clothes your core temperature can drop precipitously. You will also get cold when you get wet, whether from perspiration, rain, or an unexpected dunking in a mountain stream. Clothing layers and being sensible are the solution. When you stop, even if for a short rest, put another layer of clothes on if you start to feel at all cool. Adding a hat and mittens or gloves will lessen heat loss. You will quickly lose heat through your extremities - your head, hands and arms. When your extremities cool down you run the risk of having your core temperature drop. It is easier to keep your hands and arms and head warm than it is to rewarm your whole body when hypothermia sets in. An ounce of prevention….

Dehydration occurs, quite simply, if you are getting rid of more moisture than you are taking in. Simply put, you are not drinking enough. It is important to drink BEFORE you are thirsty. If you wait until you are thirsty to drink, you have waited too long. Carry enough water and have it accessible enough, even if it means a quick stop to fish take frequent sips. Limiting your liquid intake to avoid having to ask the party to stop for a water break or the subsequent "party separation" is not wise. In addition to dry lips, leg cramps or stiffness in your legs, and lightheadness are all telling you that you waited too long to take a drink.

DON'T DRINK THE WATER - unless you brought it with you or you have filtered it or otherwise treated it with an acceptable procedure. Those cool clear mountain streams can harbor a number of parasites, bacteria, and viruses which would happily set up housekeeping in your intestinal tract. Just because you can't see Giardia and other parasites and bacteria with the naked eye does not mean they aren't there. Use your own drinking water supply to wash your hands and face. Quite simply, Giardia and its "cousins" are transmitted via the fecal-oral route, with water a favored transportation system. Disturbing an animal's nest can also result in exposure to these pathogens.

Blisters are perhaps the most common malady of hikers. At the first sign of a "hot spot" you should stop and attend to the area. Sometimes simply readjusting your socks and retying your boots will solve the problem. Applying second skin or moleskin and Band-Aids will protect the area. You won't be the first person to make a hiking party stop to take care of a potential blister. Anyone who has "toughed it out" to avoid inconveniencing the group can attest to the folly of that.

Aside from the discomfort, a blister can result in open skin which can get infected. Everyone would rather wait while you attend to your feet than have to carry you out if you become unable to walk on your own.

Adjusting your boot laces can avoid blisters and other foot problems. The action of your foot going down a steep grade is different from going up and you may need to tighten your boot up for the return part of the trip or adjust the tension in the laces.

Bee stings and other medical concerns - if you are allergic to bee stings or are asthmatic, diabetic, or have some other medical problem, you need to do two things before each hike: *you need to be sure you have the proper medication clearly labeled in your first aid kit* and *you need to notify the leader*. Even if you think it highly unlikely that your condition will flare up, if it does and you have not told anyone of your problem, the group may waste precious time figuring out what the problem is before they can help you.

Also, you need to be sure that your first aid kit is clearly identifiable. If you are hurt your hiking partners will need to be able to find your first aid kit to locate any special medication you brought with you and to add your supplies to the group's first aid resources. Label your first aid kit clearly on the outside so someone looking for it will find it quickly.

"Party Separations" & "Cat Holes". While pit toilets or port-a-potties are found at many trailheads, they are not at all trailheads, and they are not found along the trails. This is a concern for day hikers as well as for backpackers staying over night. The issues are those of personal privacy, responsible sanitation practices and environmental awareness.

“Party separations” are how Mountaineers deal with the absence of toilets out in the wilderness. The term refers to those times when the group will split up by gender and go off the trail in search of some semblance of privacy for everyone.

It is important to go at least 200 feet from any open water - streams and lakes, allowing for the bottle out of your pack, that you can maximum water level around lakes. It is acceptable practice to urinate in random locations away from water and not directly on fragile plants, although it is courteous to cover yellow snow. A “cat hole” can be dug and filled in with loose soil after use. A “cat hole” should be 8 to 10 inches in diameter and no more than 8 inches deep. Biodegradable waste buried in the humus layer in this manner will decompose quickly.

Used toilet paper, feminine hygiene products, and Band-Aids should be packed out for disposal at home. While toilet paper will eventually decompose, an accumulation of toilet paper in the wilderness is not aesthetically pleasing and is subject to being dug up and exposed by animals. Nonbiodegradable items by their nature will not decompose. Used toilet paper and other items can be sealed in plastic bags or other airtight container and can be unobtrusively and inoffensively carried out in an exterior pocket of your pack.

Conditioning

As part of the preparation for this course, it is important that each student develop sufficient physical strength in order to have the energy and endurance necessary to put into practice skills that you will be taught. If you are NOT "in condition", any or all of the following may occur:

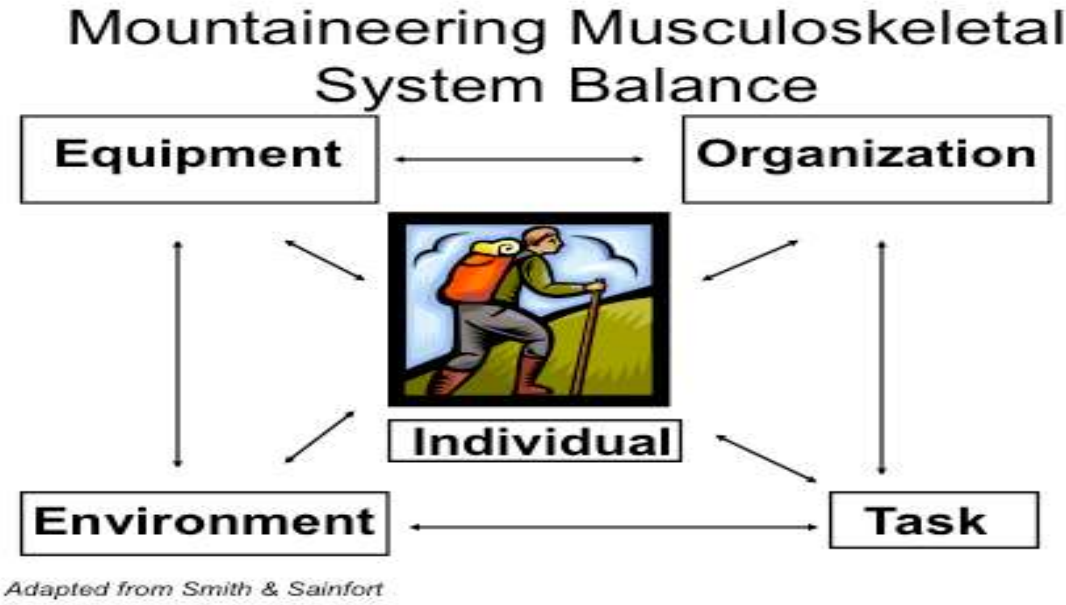
- You will fatigue easily after a short period of exercise.
- Your body is operating inefficiently – you use more oxygen for a given amount of work and your muscles accumulate more lactic acid during exertion, which tends to produce cramps and bring on stiffness and pain in the following days.
- As you push yourself toward exhaustion, you may frequently stumble and become too tired to concentrate on route finding and other technical skills.
- You will have little or no reserves available for an emergency.
- You may become a liability to your party.
- You will recuperate slowly and will be dead-tired the next day.

Energy expenditures may be nearly identical for all party members on a trip together. However, there may be wide variations in their available aerobic power (the body's ability to absorb and use oxygen), depending upon age, sex and training. An individual's maximum oxygen consumption is that amount he/she uses in working to exhaustion. Thus, the length of time the expenditure of energy is required is significant. The experienced wilderness traveler sets the pace, budgeting the use of available power, so that he/she is capable of continued exertion to reach the destination, return safely and drive home. If you have less aerobic power than other party members do, you will use a much greater proportion of your total aerobic capacity. You will, therefore, have to push harder to keep up and will be exhausted sooner.

Aerobic power can only be gained if one REGULARLY participates in STRENUOUS, physical activity, such as running, swimming, bicycling, hiking, or climbing stairs. The activity should be sufficiently long enough -- 15 to 30 minutes -- to elevate your heart rate to the appropriate "working heart rate". To get the most out of your aerobic workout, your activity should be done, at a minimum, three (3) times per week.

Until you become experiences in outdoor exercise, it can be difficult to judge your level of exertion until its too late, and you’re near exhaustion. Traveling up hill on steep, difficult terrain requires a deceptively high amount of energy and determination. You will get better with every step, but until you know your abilities and limitations you need to monitor your exertion level through your pulse, perspiration and breathing. Stop periodically to see if you’re short of breath, or unable to carry on a normal conversation with your companions. If you nee more than a few minutes rest to recover and breath normally, you’re working too hard. Slow down.

B Silverstein: Physical Conditioning as Part of a Balanced System



Physical Conditioning

- Cardiovascular fitness: aerobic capacity-take in and use oxygen
- Motor fitness:
  - strength (exert force),
  - power (exert force rapidly)
  - Endurance (withstand exertion)
  - Agility (able to perform actions quickly)
  - Flexibility (bend without breaking)
- Fitness & acclimatization (expend less energy for task)
- Mt Rainier in 3 days: carry 40# pack 5 hrs on 20° snow slope, steady ascend 5K feet (40° slope) in 7 hours, then descend 9k feet in 6 hours

What you do depends on what you want to do

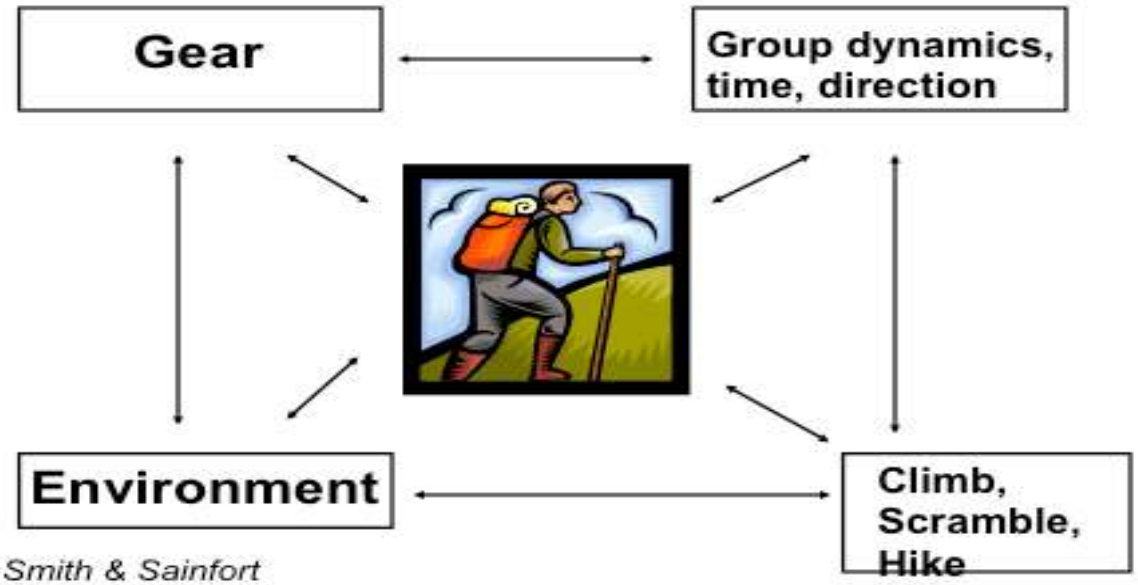
www.rmiguides.com/rainier/conditioning.html

Physical Conditioning Program

- Start in advance and set goals for self depending on what you want to be able to do.
- Use aerobic exercises for cardiovascular fitness: Mountaineering focus: cycling, stair climbing, walk up/ down hills with increasing pack weight- increase duration ->30 <60 min, 3-5x, interval training
- Motor fitness: 2 sets x 20 reps, 30 sec rest
- Core muscle strength every day
- Strengthening legs, knees, quads
- 15 min Stretching every day-slow/static, not ballistic
- Balance, aerobic and abdominal every day.
- Weights 2x week
- Warm up 10 min, warm down 5 min

Good general reference: www.bodyresults.com (getting started, sport specific)

Mountaineering System Balance



Smith & Sainfort

sprain is a stretch and/or tear of a ligament, the fibrous band of connective tissue that joins the end of one bone with another. Ligaments stabilize and support the body's joints. For example, ligaments in the knee connect the upper leg with the lower leg, enabling people to walk and run.

strain is a twist, pull and/or tear of a muscle and/or tendon. Tendons are fibrous cords of tissue that attach muscles to bone.

Causes:

Sprain: direct or indirect trauma (a fall, a blow to the body, etc.) that knocks a joint out of position, and overstretches, and, in severe cases, ruptures the supporting ligaments. Typically, this injury occurs when an individual lands on an outstretched arm; slides into a base; jumps up and lands on the side of the foot; or runs on an uneven surface.

Chronic strains: result of overuse - prolonged, repetitive movement - of muscles and tendons. Inadequate rest breaks during intensive training precipitates a strain. Acute strains are caused by a direct blow to the body, overstretching, or excessive muscle contraction.

Who gets sprains and strains? history of sprains and strains, overweight, and are in poor physical condition

Strain/Sprain Prevention tips

No one is immune to sprains and strains, but here are some tips developed by the American Academy of Orthopaedic Surgeons to help reduce your injury risk:

- Participate in a conditioning program to build muscle strength
- Do stretching exercises daily
- Always wear properly fitting shoes
- Nourish your muscles by eating a well-balanced diet
- Warm up before any sports activity, including practice
- Use or wear protective equipment appropriate for that sport

Knee overuse injury

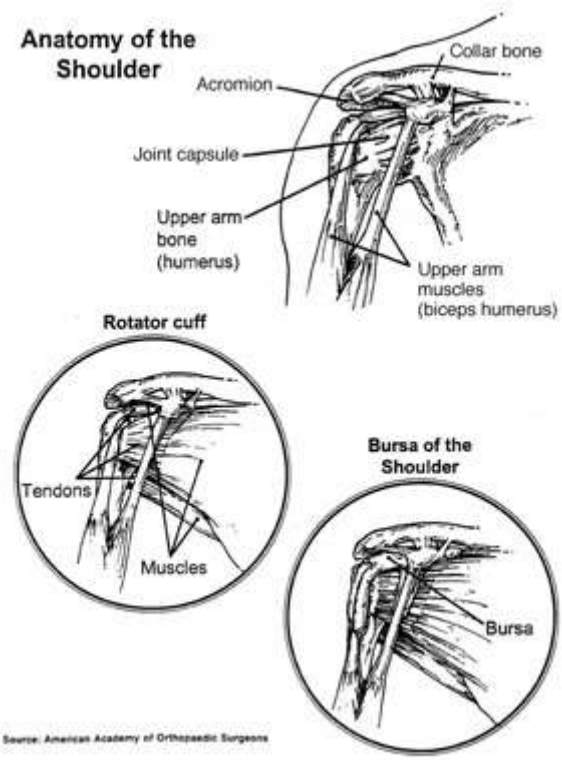
At risk: Climbing, jumping, lateral knee movements

Types: Illiotibial Band Syndrome (ITBS) ,Osteoarthritis, Patellar malalignment, Patellar Tendonitis ,Patellofemoral Syndrome, Popliteal Cysts,Prepatellar bursitis

Prevention:

- vital for any strenuous activity such as mountaineering.
- perform regular athletic exercise,
- avoiding prolonged kneeling and knee flexion,
- wear comfortable, supportive shoes and evaluating potential foot injuries.
- maintain strength and flexibility in quadriceps, hamstrings and calf muscles.
- Participate in activities to prepare you for climbing (hiking with appropriate weight over rocky terrain, rock climbing in gym, performance of athletic feats within your abilities

prevention More Info:http//www.bodyresults.com/E2KneePain3Rehab.asp



Prevalent shoulder injuries: muscle, ligament, tendon rather than bone

- Instability: one of the shoulder joints moves out of normal position-> dislocation
- Impingement: excessive rubbing of rotator cuff and top of shoulder blade (acromion) when doing excessive overhead motion (climbing)
- Rotator cuff: group of muscles that hold shoulder joint in place and provides ability to lift arm and reach overhead
- Caution: don't ignore the pain, limitation in motion or weakness->aggravate & cause more injury
- Strengthening exercises
    - Elastic band to door, pull toward you, hold 5 sec, release, repeat x 5
    - Wall push-up-hold 5 seconds, repeat x 5
    - Shoulder press-up in chair with arm-rests, push up hold 5 sec, x 5

Gear

- Consider Weight, Distance, Time of use requirements
- Fit the equipment to the individual to accomplish the task
- Keep the load close
- Take only what is necessary
- Downsize pack
- If the shoe (boot) fits
- Let the poles (not the knees) take the shock

Environmental Conditions

- Variable Weather: cold, heat, wet, visibility
- Terrain: Steep, slippery
- Forceful gripping for support in awkward postures

Organizational Factors

Duration
•Breaks
•Feedback
•Group dynamics
•Leader experience

Task requirements

- Conditioner, snow, rock, glacier
- Does it have to be accomplished today?
- Distance
- Level of difficulty
- Skill requirement
- Adequate fuel, hydration, food, warmth

Individual

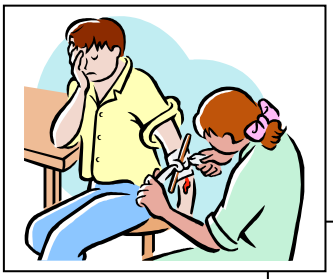
- Know your limits (a little push is ok)
- Let others know goals, concerns, health
- Improve strength, conditioning
- Practice in the neighborhood with full pack
- Get the gear you need to be comfortable, secure and not loaded down
- Bring energy (a time of intense exertion is not the time to skimp on fuel)
- Getting out there improves skills, it will get easier
- Be kind to yourself and others

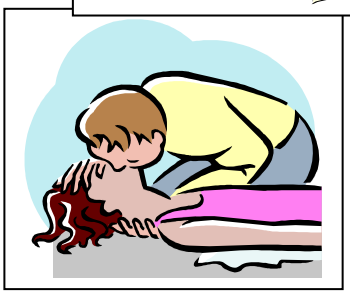
Barbara Silverstein: Physical Conditioning as Part of a Balanced System

Staying Safe and Healthy in the Hills

Preventing Injuries and Illnesses

1. Bring water and drink it
2. Bring food and eat it
3. Bring your medicines – especially for diabetes, allergies and heart disease
4. Don't believe the weather report – be ready for hot, cold, wet
5. Be serious about the 10 Essentials
6. Don't skimp on your equipment
7. Watch your step – Concentrate
8. Watch each other
9. Don't be shy – Discuss plans for emergencies
10. Always respect the mountains





Treating Injuries and Illnesses

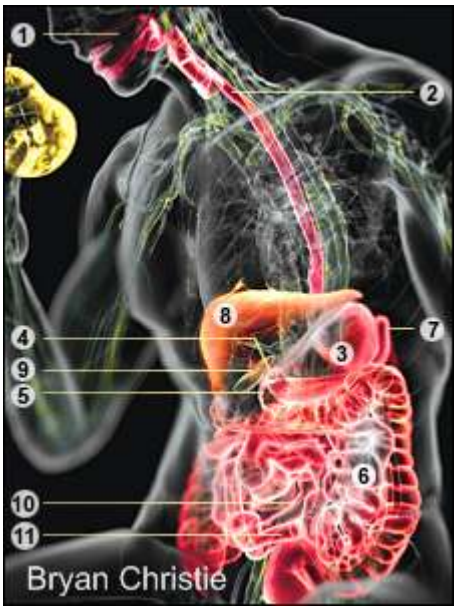
Airway	}	**ABC**
Breathing / Bleeding		
Circulation		
CPR – 2 breaths, 30 compressions		
Heimlich maneuver		
Rest	}	**RICE**
Ice		
Compress		
Elevate		
Water, sugar and salt		

Eat to Win

Know why, when, and how to fuel with our complete guide to the athlete's diet. By Monique Ryan

Eating for basic health and fitness is simple. Seriously, people. Just cook with a high variety of whole foods, emphasis on grains and produce. And eat five perfectly planned small meals a day—not three. Oh, and try to memorize the glycemic index of every enticing product in the grocery store. Even better, hire a personal shopper and a live-in chef ... Not the world you're living in? Here's another way to simplify: Read our comprehensive guide to performance nutrition and follow the straightforward rules. We guarantee you'll feel—and play—better. Or we'll eat our words.

Guts, At Work



Understand how your digestive system turns food into fuel and you've taken the first step toward smart eating. The process starts with simply chewing well, which adds **saliva (1)** and breaks food down for easier digestion. When you swallow, food travels down the **esophagus (2)** and into the **stomach (3)**. There, acid and enzymes convert food into a paste-like mix, while the **pyloric valve (4)** prevents this acidic brew from backing up. Digested food leaves your stomach in one to four hours. Carbohydrates go first, followed by protein, then fat. These macronutrients enter the **duodenum (5)**, the first section of your **small intestine (6)**. Enzymes stored in the duodenum, and those supplied by the **pancreas (7)**, complete most of the digestion process.

Bile manufactured by the **liver (8)** and secreted by the **gallbladder (9)** assists with fat digestion and absorption. The smaller molecules produced by this secondary breakdown are absorbed through the walls of the next two sections of your small intestine, the **jejunum (10)** and **ileum (11)**, which supply more than 20 feet of absorptive tissue. This length is multiplied many times over by numerous folds in the intestinal lining called villi, which are themselves covered by small, fingerlike projections called microvilli and which ultimately provide more than 820 square feet of absorptive capacity—an area larger than a tennis court. From there, nutrients are shipped off to your liver for further processing, then to cells, which create and store glucose, amino acids, and fatty acids.

Power Supply

Think of your body as a house equipped with electricity, gas, and solar: different power sources for different purposes. The fuel you tap for exercise depends on the intensity and duration of your workout.

ENERGY SYSTEM: Aerobic
USED FOR: Steady burning of fuel for any moderately paced, sustained cardio training (running, cycling, swimming, etc.)
HOW IT WORKS: For longer efforts, this system provides a sustainable supply of adenosine triphoshate (ATP), the molecule that causes contractions in your muscles. For the first 15 to 30 minutes, fuel comes mainly from glycogen stored in your muscles. Muscle fat contributes more fuel for up to 90 minutes, and after that, adipose fat (the jiggly kind) is burned as well. You have about 1,400 calories' worth of stored glycogen in your muscles and another 400 in your liver—enough for a 1.5-hour run.

ENERGY SYSTEM: Anaerobic glycolysis
USED FOR: Sustained speed for high-paced efforts, extended resistance training, intervals
HOW IT WORKS: This system kicks in when you're out of breath but still moving fast. It produces ATP at a high rate for about two minutes, using a combination of creatine phosphate (a naturally occurring compound chemical stored in muscles) and muscle glycogen. Lactic acid is a by-product.

ENERGY SYSTEM: Creatine phosphate
USED FOR: Explosive energy required for resistance training and repeated sprints
HOW IT WORKS: This system rapidly produces ATP from creatine phosphate. It yields about six to eight seconds of fuel for explosive efforts. You can take creatine supplements to bolster the system, but it helps you do only a few extra reps during power building or gives you an additional boost for repeated sprints.

Food Q&A: What's the difference between whole grains and processed whole grains?

Nothing, in terms of nutrition. Here's a primer. Whole grains: Seeds are intact, surrounded by an endosperm and nutrient-rich germ and bran.
Processed whole grains: Seeds have been cracked, rolled, crushed, or ground and provide the same nutrition as the original whole grain.
Avoid refined grains (nutrient-poor white flour) and enriched grains (same as refined but with some nutrients restored).

Five Habits of Highly Successful Eaters

1. EAT A GOOD BREAKFAST. It jump-starts your metabolism, provides energy for mid-morning workouts, and keeps you from losing steam before lunch.
2. SNACK OFTEN. Skipping meals, or waiting more than five hours between them, can slow your metabolism, cause energy dips, and lead to overeating. Bring fresh fruit and vegetables to work so you never resort to the candy machine.
3. PLAN AHEAD. Look at your schedule for the coming week, plan meals, and allow time for grocery shopping. You make time for working out; you should do the same for cooking healthy food.
4. BE RESTAURANT SAVVY. It's fine to eat out; just don't treat it like a nutritional vacation. Avoid supersize portions, ask about ingredients, and make smart substitutions (like a baked potato instead of fries).
5. GET EIGHT HOURS OF SLEEP. Inadequate rest alters levels of appetite-regulating hormones, leading to increased appetite (but not increased activity.

Weight Q&A: How can I avoid gaining weight over the holidays?

Lose five pounds before Thanksgiving. Here's how: Bump up your strength training to three times weekly, which increases lean muscle mass and the rate at which you burn calories. Then aim for a steady weight loss of half a pound to one pound weekly by reducing intake by 350 to 500 calories daily. Emphasize high-fiber, low-fat foods and mix in modest amounts of lean protein. The combination will keep you feeling satiated longer.

Legal Aid (as opposed to illegal sports aid)

Lab Rat. By Nick Heil

On the label of 5-Hour Energy—a fatigue-fighting drink that claims to be a healthy alternative to sugar bombs like Red Bull, Monster, and venti Frappuccinos—a silhouetted runner bounds up a mountain at sunset. I received the sample, which comes in a two-ounce plastic bottle, after spending a deskbound summer under a brutal book-project deadline. I looked wistfully at the image of the runner. When was the last time I'd felt like that? I read the label. FOR MODERATE ENERGY: DRINK A HALF BOTTLE OR LESS ... FOR MAXIMUM ENERGY: DRINK ENTIRE BOTTLE AT ONE TIME.

I tend to be skeptical of such products, but suddenly I found myself tearing off the cap and gulping the contents, the ultra-tart liquid making a little glick-glick-glick sound as it emptied into my mouth. It was around 2 p.m., and that afternoon I finished writing a book chapter, did three loads of laundry, cleaned and organized my office, and took my dog out for an hour-long trail run. Shazam—I was that guy on the bottle!

The boost behind the juice comes from large doses of B vitamins and a proprietary energy blend that includes, among other things, caffeine, taurine, and phenylalanine. I tried 5-Hour again the next day, with similar results; I even scored the winning goal in my weekly soccer game.

I was so amazed by the jolt that I called up sports dietitian Dave Ellis, who works with pros from the NFL and NBA. He hadn't tried 5-Hour, but he wasn't impressed. "You build a tolerance to these stimulants, and when you can't feel one, you go to two; when you can't feel two, you go to three," he said. "That creates a cycle of codependence."

Living Essentials, the maker of 5-Hour, claims it's not just the caffeine but the large hit of B vitamins that provides the punch. Each shot contains 40 milligrams of vitamin B6 and 500 micrograms of B12—respectively, 2,000 and 8,333 percent of the recommended daily allowances. It's long been known that B vitamins aid the metabolism and sharpen mental acuity; my grandfather, a physician, used to give my grandmother B12 shots to crank up her energy. "The problem is, we don't know what happens over time when you isolate nutrients," Ellis said. "The combination of nutrients in real food offers benefits that we're just beginning to discover."

This Just In

News from the nutrition frontier

COFFEE: Stop feeling guilty about your java cravings. First, it's a myth that a moderate amount of caffeine causes dehydration during exercise. Coffee contains heart-healthy soluble fiber—known to reduce cholesterol levels—according to a study published in the *Journal of Agricultural and Food Chemistry*. Another study, in the *American Journal of Clinical Nutrition*, suggests that drinking two to three cups of coffee daily lowers the risk of developing cardiovascular disease. Coffee is also a good source of antioxidants, including cancer-fighting polyphenols.

VITAMIN D: Don't go light on this critical vitamin. Not only is D essential to bone health; it may also help prevent certain cancers and autoimmune diseases. Researchers from the Harvard School of Public Health found that higher vitamin D levels are associated with a lower risk of developing multiple sclerosis. Most people naturally get 200 to 400 IU daily, but experts now recommend 800 IU each day from food and supplements combined. Get yours from a daily multivitamin. We like Centrum Silver Tablets, which have 500 IU of vitamin D (ignore the marketing message for "older" adults).

SNACKS: Munching small portions evenly throughout the day—rather than overeating at meal times—is good for your waistline *and* your job. A study in the journal *Medicine & Science in Sports & Exercise* found that firefighters who split their usual meals into regular snacks had significant increases in productivity, especially during the latter hours of the day.

Nutrition Q&A: Is it worth splurging on exotic juices that claim health benefits?
While juices made from mangosteen, noni, goji, açai, and others are high in antioxidants, there's little evidence that these trendy "superfruits" are better for you than other dark-colored berries. The best advice: Just eat a variety of brightly colored fruits and vegetables daily.

Energizers

Get the right mix of highs and lows by understanding the glycemic index.

You know that carbo-loading preps your body for a big effort by topping off glycogen stores in your muscles and liver. But not all pasta parties are equal. Some carbs (like white pasta) hit your system hard, giving you a quick boost but dropping off abruptly, while others (like whole-grain pasta) are processed slowly, supplying sustained energy. This difference in the blood-sugar spike is called the glycemic index (GI) or glycemic load (GL). (You'll see both terms in the marketplace.) High-glycemic foods are particularly helpful for training and recovery eating, when you need to replenish glycogen quickly. For routine meals and snacks, however, round out your diet with foods lower on the glycemic scale. The most important thing is simply to remember that athletes need a mix of low-, moderate-, and high-glycemic carbs in their daily diet. Use the following guide.

Glycemic Index: *Low = less than 55; moderate = 55–70; high = more than 70*
Glycemic Load: *Low = less than 10; moderate = 11–19; high = more than 20*

Here are GL figures for some common foods. Get more at glycemicindex.com.

	Serving size	*Total carbs*	*GL*
HIGH			
Baked potato	7.1 oz	29.0 g	27.3
Spaghetti (white)	6.4 oz	44.3 g	25.7
Bagel (white)	2.5 oz	35.5 g	25.6
Pancakes	2.8 oz	32.5 g	21.8
MODERATE			
Muesli	1.8 oz	30.2 g	18
Spaghetti (whole-grain)	6.4 oz	44.3 g	14.2
Sweet potato	5.3 oz	26.0 g	12.5
Banana	4.2 oz	23.9 g	12.2
Orange juice	9.3 oz	21.1 g	12.0
LOW			
Apple	4.2 oz	14.6 g	5.9
Lentils	5.3 oz	14.9 g	4.2

Nutrition & Backcountry Foods: Eating on the Trail

Energy Nutrients: length/intensity of trip

Food as fuel: Carbs, fat, protein for performance

Nourishment: energy and other nutrients. Eating the food groups.

Hydration: dehydration, requirements, caffeine, heat/humidity/exertion, thirst/urination

availability & sanitizing water,

balancing hydration with pracitcality

Spare food: various food bars vs. extra food

Food Safety: 2 hour rule, salt/sugar/dehydration, protein foods

Weight: Packaging, water, energy density, & equipment

Space: length of trip, number of people, bear canisters

Durability: will it squish, bruise, or crumble? Effect of cold, heat?

Cooking time: fire vs. stove, fuel, altitude, rehydrate vs. cooking, daylight, weather

Equipment: mess kits, pots, kitchen, dishwashing , stoves, fires

Packing and organizing: by person, meal, group. Ziplocs.

Creativity/pleasure vs. functionality: type of trip, how creative do you want to be?

Transforming Foods: Tacos Stirfry

Backcountry products vs. homemade vs. grocery store items

Breakfast Ideas:
Lunch Ideas:
Dinner Ideas:
Good Snacks:

Back Country Foods by Food Groups

(weight/space, packaging, durability, nourishment/calories, cooking capabilities)

Protein (protein, iron, zinc, B vitamins)
Hard cooked eggs
freeze dried eggs
beef or turkey jerkey, vegetarian jerkey
Gallo hard salami
deyhdrated hamburger, seasoned or plain
dehydrated minced or shredded seasoned chicken or turkey
dehydrated refried beans
dehydrated bean soups
falafel and hummous mixes
shelf stable tofu (Nori-Nu)
dried TVP, fake bacon bits
nuts, soynuts, seeds
nut butters
smoked salmon (bears love it)
deyhdrated tuna fish
foil packed tuna or salmon or chicken or ham or turkey
high protein bars like Power Bars
frozen fresh meat for first day

Vegetables (potassium, vitamins A and C)
cabbage
cucumbers, zucchini
carrots
onions, green onions
cauliflower, broccoli
pea pods
dehydrated vegie mix
dried mushrooms
tomato paste, pasta sauce in bag
pesto paste in tubes
potatoes, mashed potatoes(very high potassium).....see starches
olives
pickled vegetables, pickles

Fruits (sugar, potassium, vitamin A, C)
all types of dried (raisins, plums, apricots, cherries, pineapple, mango, strawberries)
real fruit leather (Stretch Island, Tree Top)
durable fruit such as apples, oranges, whole melon
less durable fruit packed in pans
12 oz. canned fruit juice concentrate
lemons or limes with sugar

Grain Foods/Starch (starch, B vitamins, fiber/magnesium if whole grain)
instant mashed potatoes
whole potatoes
instant or quick cooking rice
bulgar wheat, millet, quinoa
small, quick cooking or instant pasta/noodles like cous cous or angle hair pasta
Ramen (very high in harmful fats, high in salt)
dense baguette or small compact loaf bread, preferably whole grain
tortillas, pita bread, English muffins, bagels
pilot bread, Ry Krisp, hard tack, stoned wheat thins, graham crackers
instant oatmeal, cream of wheat or rice, grits
granola, muesli, dense cereals like Oat Squares, Shredded Wheat, Grape Nuts
baking mix, pancake mix for pancakes, biscuits, quickbread, dessert bread

Dairy (protein, calcium, potassium)
regular cheese for first day
Velveeta cheese
parmesan cheese
powdered milk for pudding, drinking or cereal, mix with Tang or Cocoa mix, etc
macaroni and cheese mix

Fats (fat, vitamin E)
Nuts and seeds (magnesium, B vitamins)
oils or margarine in Nalgene or tight container
crisco shortening
individual mayonnaise packets
olives
chocolate (iron, B vitamins)

Sugary/carbohydrate foods
powdered drink mixes like Tang, hot cocoa, cider
granola and other snack bars
fake fruit leathers
cookies/bars/Fig Newtons/Pop Tarts
candy

Favorite Meals
Mashed potatoes and hamburger gravy with vegies
Vegetable (cabbage, celery, onion, broccoli) stirfry with tofu and nuts over rice
macaroni and cheese with vegetable bits, sausage or bacon bits
tortillas with refried beans, cheese, cabbage/cucumber slices
Creamed chicken, smoked salmon, or tuna over noodles, muffins
Falafel or humous with olives and cucumber in pita bread

Sample 3000 Calorie Diet:
60% carbohydrate, 87 g. protein

Breakfast:
Hot Cocoa
1 lg. Bagel
1 T. paanut butter
1 T. jelly
8 dried apricot halves

Snack:
4 T. raisins
1/2 c. cereal
3 T. chocolate chips

Lunch:
1 med. Apple
9 Rye Krisp
2 oz. Cheese
2 oz. Sausage
4 fig newtons

Snack:
1 energy bar/sports

Dinner:
1-1/2 cup rice
2 oz. Chicken
1/2 c. vegetables
2 t. oil & soy sauce
tea with 1 t. sugar
1 oz. Chocolate bar with nuts

Favorite Meals
Mashed potatoes and hamburger gravy with veggies
Vegetable (cabbage, celery, onion, broccoli) stirfry with tofu and nuts over rice
macaroni and cheese with vegetable bits, sausage or bacon bits
tortillas with refried beans, cheese, cabbage/cucumber slices
Creamed chicken, smoked salmon, or tuna over noodles, muffins
Falafel or hummous with olives and cucumber in pita bread

WHAT IS MOFA?

Mountaineering Oriented First Aid (MOFA) is the first aid course The Mountaineers have adopted for Alpine Scrambling and all the Climbing courses. It is also required for all trip leaders including hiking trip leaders so that participants are able to respond effectively and efficiently to the type of injuries that may occur in the mountains. Hikers, backpackers and anyone traveling in the backcountry should give serious consideration to completing the MOFA course.

Trail Skills MOFA Class

To help you respond efficiently and effectively to small injuries and serious injuries by providing first aid functions to:

- Stabilize the patient
- Provide CPR if needed
- Treat injuries
- Get help – primary care

Also to understand and recognize risk and practice prevention. All in the Wilderness setting – 2 or more hours from primary care. A group of dedicated volunteers will help you learn

- ❑ patient care & stabilization
- ❑ first-aid level injury treatment
- ❑ effective team response
- ❑ 7 steps to help you effectively:

1. recognize the situation
2. respond safely
3. find and treat urgent injuries
4. stabilize your patients
5. apply first-aid and team skills
6. make a plan to provide continuing first aid while getting patients primary care
7. carry out the plan which may mean; stopping your trip, walking out, or sheltering in place and requesting rescue.

REGISTRATION

Online signup: http://www.mountaineers.org//source/atrips/tripselection.cfm
Main club website – activity search. Activity name: mofa. Click “any date is fine”
Contact: Eric Quinn email: traileq@ubrdo.com or phone 360-556-4969

Seven Steps for First Aid Response

1.Take Charge

Calm and organize group for an effective response in a minimum amount of time.

2.Approach the Patient Safely

Avoid further injury to patient, keep group safe.

3. Perform Emergency Rescue and Urgent First Aid

Treat conditions that can cause loss of life in a few minutes. Breathing, pulse, bleeding, site risks.

4. Protect the Patient

Reduce physical and emotional demands on patient. Protect from hot or cold. TLC.

5.Check for Other Injuries
Once the life-threatening emergencies have been identified and controlled perform exam to find and ALL injuries.

6. Plan What to Do
Once urgent care and secondary exam is complete assess:
injuries, resources, team, and conditions. Plan further first aid and evacuation.

7.Carry Out the Plan and First Aid
Coordinate and execute the plan.

The Mountaineering First Aid Kit

Item ----- Quantity --- & --- Size Use

- Adhesive Bandages 6, 1-inch minor wounds
- Butterfly bandages 3, various sizes minor lacerations
- Sterile gauze pads 4, 4”x4” larger wounds
- 1, 4” severe bleeding
- Non-adherent dressings 2, 4”x4” abrasions, burns
- Self-adherent roller bandage 2 rolls, 2” x 5 yards hold dressing in place
- Cloth-based adhesive tape 2”-wide roll multiple use
- Triangular bandage 2, 36” x 36” x 52” sling, cravat
- Moleskin / mole foam 4” to 6” square blisters
- ½ ounce adhesive, protects skin, optional
- 2 packages antiseptic
- Alcohol or soap pads 3 packages cleanse skin
- Thermometer 90 F to 105 F estimate body temperature
- Sugar packet 4 packages diabetes
- Aspirin 6 tablets headache, pain
- Acetaminophen 6 tablets
- 6 tablets allergic reactions
- Elastic Bandage 1 sprains, RICE
- 2 pair barriers against infection
- Plastic bag 1, 12” x 18” hold contaminated material
- Personal medication
- Accident Report form
- Carlisle dressing or sanitary napkins
- Tincture of benzoin
- Povidone iodine swabs
- headache, pain, use for kids or those allergic to aspirin
- Diphenhydramine
- Barrier gloves & mask, natrile or latex

Hazards

There are many hazards in the mountains. Hopefully, we have taught you skills for making your travel safer and you have acquired knowledge for making your judgment sound. We cannot eliminate the hazards, except by staying home. Each of us must balance the joys of mountaineering with the risks. Ultimately, that responsibility is a personal one.

A *hazardous* situation is one that includes a *possible* injury.
A *dangerous* situation is one that includes a *probable* injury.

Hazardous becomes dangerous through your actions, changes in the surroundings, or both.

Objective Dangers

- Avalanche
- Rock fall
- Lightning
- River or creek crossing
- Glissading
- Equipment failure
- First aid
- Driving to and from (defensive driving)

Subjective Dangers

- Lack of knowledge and capability.
- Judgment - when in doubt, be conservative.
- Taking calculated risks - evaluate the consequences.

Lost - What to do

- Stop! Stay calm, try to attract attention.
- Conserve energy -- review the situation, formulate a plan, mentally retrace the last few minutes.
- Before darkness, select shelter and gather firewood.
- Show National Distress Signal (three (3) of anything).
- If not found after two (2) days, self-rescue.

Mental Stress

- Fear of things
- Peer pressure
- Obligations

Your Obligations

- To respect life - yours, others, the creatures too
- To protect life - "the margin of safety “
- Be aware of the hazards are or can be.
- Learn techniques
- Use knowledge and attitude to reduce change of injury
- Follow the Mountaineer Code!

Emergencies

Accidents

Accidents on *Mountaineers* trips should be reported to *The Mountaineers*. In case of an emergency:

1. Assist the victim
2. Initiate rescue through the appropriate local agency (usually the county sheriff's office).
3. Complete a First Aid/Accident Report Form. You will receive one in your MOFA course, and each trip leader carries a copy.

Survival

Survival is simply staying alive long enough to get out of your predicament. Any survival situation requires mental control over unnecessary physical movement. Survival in this modern age is generally a short-term situation. Usually an organized search is initiated as soon as you are reported overdue. Sheltering the body and conserving energy and body heat is your greatest concern.

If you're lost:

- Stop
- Look around
- Listen
- Shout and use your whistle
- Sit down
- Be calm
- Relax

- Stay put. If lost or unsure of direction to travel, stay put - near an open area if possible, and await the searchers who will be looking for you.
- Display something conspicuous so the searcher can find you.
- Find shelter

If the entire party is lost or in trouble, do not separate the party unless each separated team is fully self-sufficient. Can your team spend the night safely in the mountains? Help is a long way away and a long time coming.

Other Factors

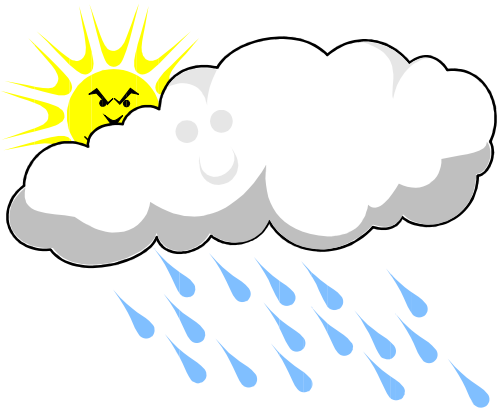
- **Shelter.** Seek protection from wind, cold, rain, sun. Use any ready-made natural shelter: underneath trees, logs, rocks, cliffs - - any place with a lee (away from the wind) side to protect the body from wind and rain.
- **Travel**. If you are sure of direction to travel, travel slowly, conserving energy. Stay near open areas.
- **Ice**. Beware of walking on ice. Generally, in the higher elevations in winter, all lakes are frozen and snow covered. In the spring and fall, however, and at lower elevations, ice may not support your weight. As a general rule, ice should be 2 inches thick to safely support walking. Clear ice is safest; if it's foggy-looking, that means it's soft. If in doubt, stay off of it.
- **Sleeping in cold weather**. If your clothes are dry and you have conserved your energy, you may sleep safely for short periods. On awakening, move vigorously to warm yourself. When circulation is restored

you may sleep again. People who die from exposure or freezing generally have exhausted their body heat and energy before sleeping.

- **Compass and maps**. Never go anywhere without a compass and map - - and know how to use them.
- **Equipment**. Never separate yourself from the equipment you require for survival. Your clothing and equipment improve considerably your chances for survival.

Weather

Weather is often the critical factor when making " GO of NO GO" decisions before or during a hike. In Washington State, the variability of the weather makes knowledge and observation of changes in the sky, air temperature, wind direction, formation of clouds, moisture content of the air and many other climatic factors an essential part of mountaineering.



Mountain Weather

Weather Forecast

- TV weather map - satellite photo
- Weather service - phone, newspaper, and radio

Origins of Weather

- Fronts
- Prevailing winds

Forecasting With Clouds

- Types Of Cloud
  - Cirrus: warning of approaching bad weather (24-hours)
  - Alto: approaching bad weather (6-10 hours)
  - Stratus: low level clouds (morning fog, afternoon sun)
  - Nimbo Stratus: steady rain
  - Cumulus: moist, unstable air (cotton puffs when fair weather)
  - Cumulo Nimbus: thunderstorms
  - Cloud Caps: descending means bad weather
- Cloud Orientation Rules
  - High or middle clouds moving from the south are an indicator of deteriorating weather. Movement from the north indicates fair weather.
  - Low clouds moving from the south indicate deteriorating weather, especially if moving fast. Movement from the north indicates fair or improving weather.
  - When clouds are absent, a strong north wind indicates fair weather.

Local Weather Patterns

- Adiabatic cooling and heating
- Chinook winds
- Mountain and valley winds

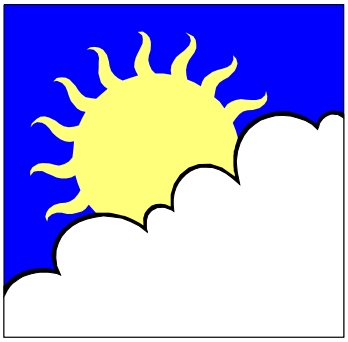
Weather (General Information)

- **Wind**. Protect yourself from it; cover your body or find adequate shelter.
- **Rain**. Keep as dry as possible - remain in shelter. Wet clothing causes excessive body heat loss.
- **Blizzard**. Do not travel. Quickly find shelter from wind and cold. Remain until storm is over. Keep insulation under you.

- **White-out**. Do not travel. Wait for clearing skies.
- **Dense fog**. Do not travel. Find shelter.
- **Darkness**. Do not travel. Improvise shelter and wait for daylight.
- **Lightning**. Leave high, exposed areas immediately. Crouch down away from trees, caves and cliffs.
- **Check on the weather!** It's not just the trip leader's responsibility to be aware of the weather; it is every member of the party's responsibility. Before every trip, listen to the NOAA weather report on a "weather" radio, or call the local weather phone numbers in the appendix.

Weather Predicting

Below is a compendium of folk sayings, common observations, and "scientific" principles useful in predicting local weather. The most reliable sources for weather predictions is NOAA Weather Radio or computerized weather data services (see phone lists).



- In the absence of any contradictory signs, predict tomorrow the weather you had today. In our area, the weather frequently occurs in seven-day patterns; today's weather will likely occur on the same day next week.
- A halo around the moon or sun means rain, usually within 24 hours.
- Red sky by night, sailor's delight. Red sky by morning, sailor take warning. True? The night part is about 70% accurate.
- Tomorrow's weather usually comes from the west, and when the sky is clear (no water or moisture), the atmosphere scatters the light at the blue end of the spectrum, leaving mostly red. Thus, tomorrow's weather is likely to be good.
- A lenticular cloud cap on Mt. Rainier, or other high peaks, is nearly always a sign of rain, probably within 24-36 hours. If Rainier is absolutely clear in the afternoon, the weather usually will hold for 24 hours. High cirrus clouds usually mean precipitation possible within 24-48 hours.
- The distinction between thick fog and real storm clouds is not easy to make from a canyon or valley; but, if it is raining, there is no hope of climbing above the clouds (except on very high mountains).
- Rising fog is not normally associated with the onset of a storm; descending fog does indicate an approaching storm and, worse, may prevent you from seeing it until too late.
- A steady fall of a barometer (while you are not climbing) is an indication that rain is coming. The greater the rate of change, the more certain the storm. In worsening weather, an altimeter reads higher, the opposite of a barometer.
- A rising barometer (while you are not descending) indicates good weather. An altimeter reads lower.
- You can determine the time until sunset by counting the number of your fingers between the horizon and the sun; each finger equals approximately 15 minutes.
- The driest time of the year is the last 10 days of July and first 2 weeks of August.
- You can estimate the temperature where you are going:
    - As elevation increases, temperature generally decreases at approximately 3.6 degrees per 1,000 feet of elevation:
    - 5 degrees Fahrenheit for each 1,000 feet of elevation in dry, stable weather,
    - 3 degrees Fahrenheit for each 1,000 feet of elevation in moist weather.
- If hot air rises, then why is it always cooler in the mountains? Because as hot air rises, it cools. On its way skyward, decreasing atmospheric pressure causes it to expand and, consequently, gradually grow colder. Air is warmed mainly by sunlight hitting the Earth's surface. The farther you get from the radiant

effects of the ground, the lower the temperature.....but mountains are ground too -- while sunlight warms peaks just as it warms valleys, mountains are surrounded by brisk, breezy, high-altitude air, which keeps them refrigerated. All things being equal, the summit of Mount Everest ought to be an invigorating 104 degrees cooler than sea level.

- Storms generally start occurring in October, and persistent snow begins in November in the mountains. Precipitation increases in December, reaching maximum intensity in January. Expect snowstorms in the mountains through April, and snow presence through June.

Beaufort Wind Scale

Developed in 1805 by Sir Francis Beaufort of England

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects	
			On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole trees in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (30-45 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

Most of these books and films are available through the Olympia Mountaineers Library or the Timberland Library.
Links to much of the information below are available at our branch website
http://www.olympiamountaineers.org/

Weather

- **"Mountain Weather", Jeff Renner**
  This is a good reference for those of us who aren't weather scientists.
- **Washington State Dept. of Transportation**
  - **Mountain Pass Report**
    You've got to be able to drive there, right? http://www.wsdot.wa.gov/traffic/passes/
- **NOAA**
  - **Mt. Rainier forecast**
    The 3-day forecast for the West side & summit:
    http://www.nws.noaa.gov/view/validProds.php?prod=REC&node=KSEW
  - **Western Region**
    http://www.wrh.noaa.gov/
  - **River Forecast Centers**
    http://www.weather.gov/ahps/rfc/rfc.php
  - **RSS**
    Interested in RSS feeds of current weather information? http://www.weather.gov/rss/
  - **Beaufort Wind Scale**
    http://www.spc.noaa.gov/faq/tornado/beaufort.html
- **Other local forecasts & webcams**
  - **Cascade Volcano WebCams**
    This is a good series of links to local webcams.
    http://www.skimountaineer.com/CascadeSki/CascadeWebCams.php
  - **Mt. Rainier: Paradise**
    http://mms.nps.gov/mora/cam/paradise.jpg
  - **Smith Rock**
    http://www.smithrock.com/
- **Avalanches**
  - **Northwest Weather and Avalanche Center**
    If you're heading out in the snow you should definitely check out these avalanche predictions
    http://www.nwac.us/
  - **Facebook Group: Avalanche - Decision Making Before and During Backcountry Travel**
- **Surf Forecasts**
  WaveWatch http://www.wavewatch.com/Surf-Forecast-Region.php?RegionID=1
  Magic Seaweed http://magicseaweed.com/

Hazards

- **Adventure Experience Paradigm**
  - My explanation of this theory is very basic. You'll find more complete details in these works.
    Martin, P., & Priest, S. (1986). Understanding the Adventure Experience, J*ournal of Adventure Education, 3*, 18-21.
    Priest, S. (1990). The Adventure Experience Paradigm, *Adventure Education,* 157-162
- **Fauna**
  - **"Don't Get Eaten: The Dangers of Animals that Charge or Attack", Dave Smith**
  - **"Don't Get Bitten: The Dangers of Things That Bite or Sting", Buck Tilton, M.S.**
    These are excellent, small and **cheap** references published by Mountaineers Books. Lots of information on hazards, prevention & treatment. Word of warning: "Don't Get Bitten" is not for the squeamish or those with bug phobias. Spray your DEET.

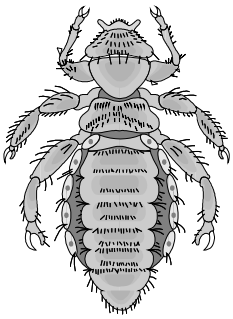
- **"Backcountry Bear Basics: the Definitive Guide to Avoiding Unpleasant Encounters", Dave Smith**
  This is another Mountaineers book that is a good reference for traveling in the backcountry. Plenty of information on bear biology and avoidance strategies. Debunks a lot of bear myths.
- **"Bear Attacks: Their Causes and Avoidance", Stephen Herrero**
  Herrero is a professional wildlife biologist and an expert in bear biology. This book provides a lot of historical and statistical information on bear attacks, and advice in avoiding conflicts.
- **Giardia, Yellowjackets & Ticks**
  National Library of Medicine site: http://medlineplus.gov/ Good information on diseases & prevention. Many links to other good sites.
- **Cougars**
  http://www.mountainlion.org
- **Montana Fish Wildlife & Parks Bear Identification Test**
  Bear hunters in Montana must be able to distinguish between black and grizzly bears. Their interactive training and test are at this link. Who needs Xbox?
  http://fwp.mt.gov/bearid/default.html

Fun stuff that I couldn't find a better place for…

Metolius: Near-Miss Harness Safety Stories

- Scary tales of harness abuse (all of which plug Metolius products)
  http://metoliusclimbing.com/article_safetechstories.htm

Ticks

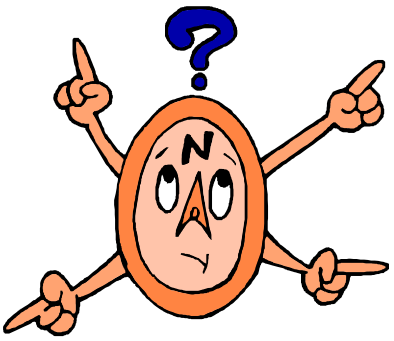


Ticks are not insects but close relatives of mites and spiders. If something nearly round, dark, about the thickness of cereal box cardboard, and with more legs than you can easily count is scuttling over any part of you...and you cannot crush it between thumb and forefinger, then it almost certainly is a tick. Ticks hatch from eggs and grow through three distinct stages: nymph (too small to see), larva (just visible), and adult (ready to copulate and lay eggs). Ticks at any stage of development can use us for food, and at each stage they need a 'blood meal' before they can grow to the next stage. With the blood they pick up any microbes that are circulating in their temporary host and carry them to their next meal, thus spreading disease.

The biggest problem ticks have is finding an appropriate host for their next meal. They cannot fly, they crawl only slowly so generally they cannot travel more than a few yards without some help. Lacking the machinery for moving through space, ticks have become masters at moving through time. They can wait for months, years, or even decades for the next host(meal) to come along. This is called questing behavior. They crawl or scuttle up on a blade of grass or a twig and settle in. If nothing with blood walks by, they wait, wait, wait. How do they know when something with blood is walking by? They don't see well but have an extremely sensitive and rapid response to a whiff of carbon dioxide, what we and all animals exhale. Given such a whiff, the nearly dormant tick is instantly activated. It scuttles rapidly or almost leaps onto anything that brushes by. Since ticks lay large numbers of eggs and the offspring don't often travel far, it is possible to walk through a whole batch of activated ticks, or heaven help you, to lie down among them.

Most of the ways getting rid of ticks don't work very well. Covering the tick with nail polish or oil is often suggested. Removal is best done with a pair of tweezers small enough to grasp only the head of the tick. Pull the head and attached tick out slowly and apply a dab of antiseptic.

Navigation Fundamentals



Navigation in mountainous terrain and wilderness areas requires a set of skill, of which using a map and compass is only one part. These skills will not only assist in reaching a destination, but may also be necessary for taking an alternate route. Navigation is an art because of the abilities and techniques required and a science because it is based on the systematic application of physical laws. All navigation, from the most elementary to the most complex, involves two things: (1) Determining your present location; and (2) Getting from one known point to another.

Selecting a Compass

Required Features

The principal parts of the compass must include: (See fig. 1)

- A rectangular, transparent base plate with a direction of travel and a scale (inch, centimeter, or millimeter) on at least one edge.
- A rotating, graduated dial marked from "0" to "360", a liquid damped magnetic needle, meridian lines and an orienting arrow.
- Degree graduations of no more than two degrees.

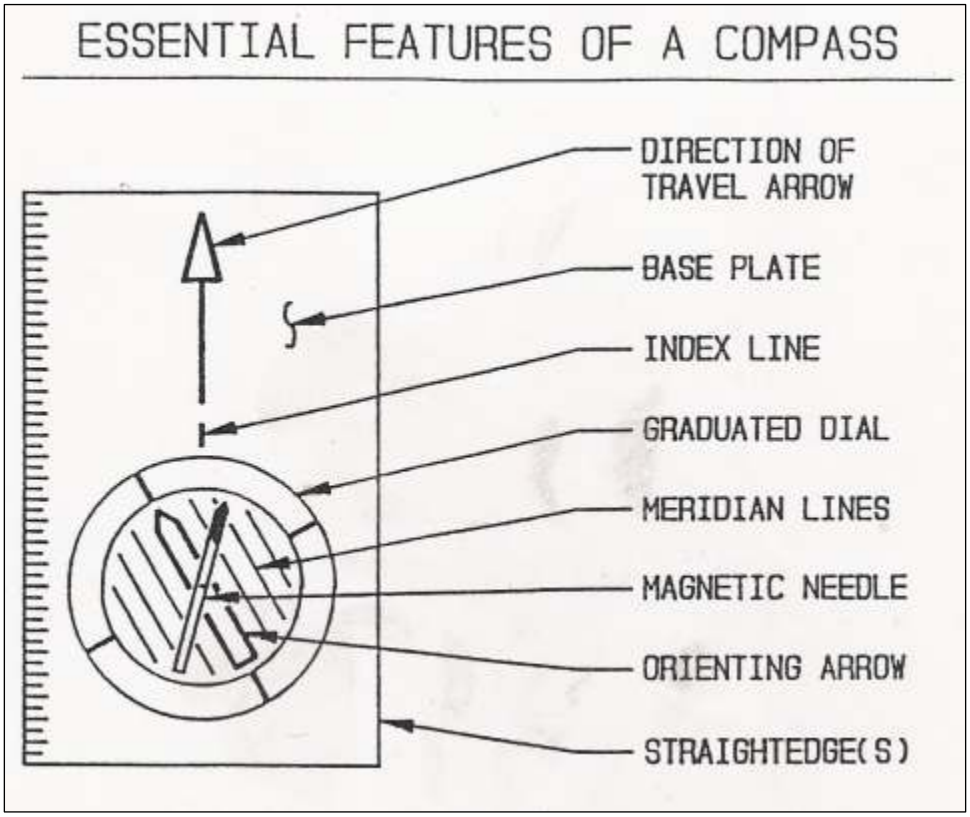


Figure 1

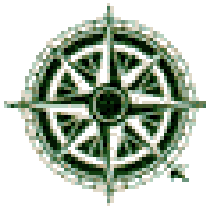
Optional Features

There are optional features available, in addition to the basic requirements that should be considered. These extras will increase the cost of the compass, but may be worth the expenditure depending on the intended use.

1. Luminous points - enhances the use of the compass in minimum lighting conditions.
2. Offsetting mechanism - a feature that, when set, will automatically correct for declination in any given area. The adjustment simultaneously takes care of both map and field bearing.
3. Sighting mirror - more accurate in taking bearings. Cover can be opened to extend straightedge making map work easier. It may also be used for emergency signaling.

The following brands and models meet all the basic requirements. Some have additional features and are so noted.

Make - Model	Opt. 1	Opt. 2	Opt. 3
Silva - Explorer	✓	✓	
Silva - Polaris			
Silva - Ranger	✓	✓	✓
Suunto - A10 Partner			
Suunto - Leader	✓	✓	
Suunto - Locator	✓	✓	
Suunto - Navigator	✓	✓	✓



Map Interpretation

A map is nothing more than a drawing of a piece of the earth's surface, as would be seen from an airplane, looking straight down. Being able to visualize terrain features from contour lines is one of the most useful map reading skills that can be developed. The map not only shows terrain, but also streams, rivers, lakes, roads, trails, and sometimes man-made objects.

Maps are drawn to **SCALE**, which is usually printed at the bottom of the map. This means that a certain distance on a map equals a certain distance in the field. A map is said to have a **LARGE** scale when there is a lot of detail within a given area. A **BAR SCALE** is usually printed at the bottom in three different units: miles, feet and kilometers. To find the distance in the field, measure the distance between the two points of the map. Take this measurement and place it just under one of the bar scales, and then read the field distance.

Thin brown (sometimes-red) lines called CONTOUR LINES represent the terrain on a TOPOGRAPHIC map**.** Each line shows the height above sea level. Contour lines never cross one another. Printed at the bottom of the map is the **CONTOUR INTERVAL,** which is the difference in height (elevation) between one brown line and the one next to it. Contour intervals are not the same on all maps. Typically, they are 40, 80, 100 feet and sometimes as much as 250 feet, depending on the scale of the map and the steepness of the terrain. Usually every fifth contour line is wider, and its elevation is printed periodically along its length (see fig. 2).

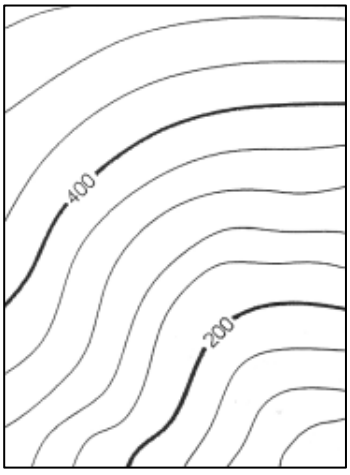


Figure 2

Interpretation of topographic maps is quite simple. Contour lines widely spaced show a gentle slope. When they are close together the slope is steep (see fig. 3). When the contour lines are close together at the top of a hill, the hilltop is pointed (see fig. 4). The hilltop is flat when the contour lines are widely spaced at the top (see fig. 5).

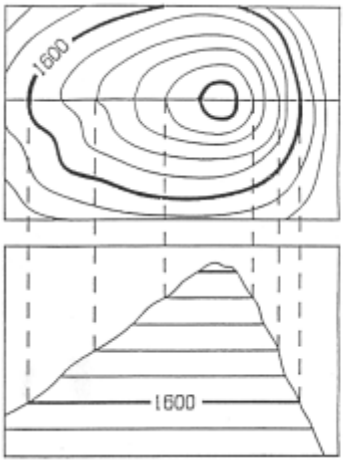


Figure 3

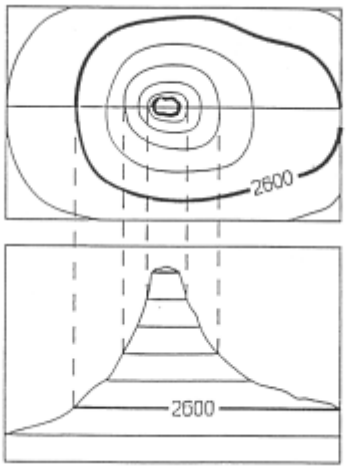


Figure 4

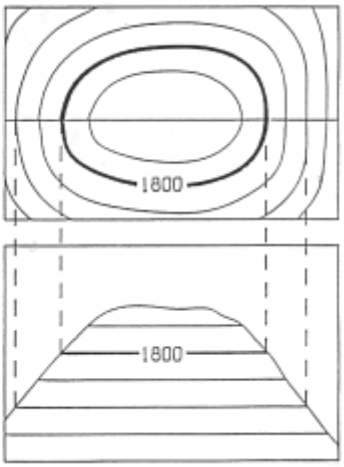


Figure 5

Figure 6

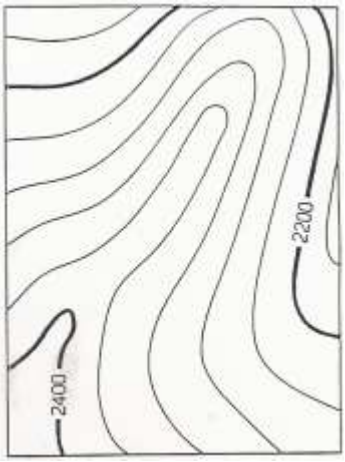
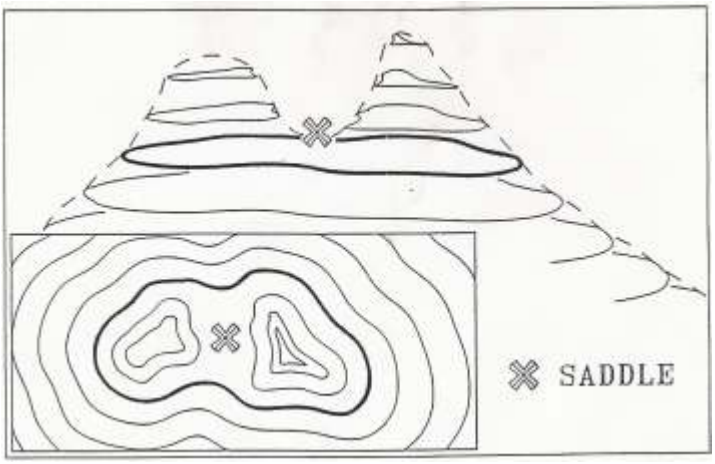


Figure 7

Contour lines across a stream always come together in a "**V**". The point of the "**V**" points upstream (see fig. 6). Another terrain feature is the **RIDGE**. A ridge is a fairly long and narrow piece of terrain. Standing on a ridge, the ground will go uphill in one direction and downhill in the other three directions. The "**U**"s point downhill (see fig. 7). Sometimes contour lines show two hilltops fairly close together.

Figure 8

The lower terrain between the two hilltops is called a **SADDLE** (see fig. 8). Roads, railroad tracks, power lines, and other manmade objects are usually shown in black, glacier and permanent snowfields in white, vegetation in green, and blue is used for water features.



The date of the survey, revision of the map, and the reference names of adjacent maps for other areas are usually given as well. Study the contour lines, symbols, colors, and other features before going in the field.

The magnetic needle in the compass is attracted by the earth's magnetism, and that is why it points north. However, there are two north's to be considered. One is **MAGNETIC NORTH,** which is where the magnetic lines of force come together. The other is **TRUE NORTH**, which is located geographically by longitude (north-south) lines that pass through each of the earth's poles. The compass needle points to magnetic north which is located in the Hudson Bay region of northeast

Canada but moves slightly each year. Maps and directions are usually based on true north, which does not move.

Map Sources

Topographical maps and other commercially prepared maps are available at most outdoor supply stores in our area including: The Alpine Experience, Olympic Outfitters, REI. Larger suppliers of maps include: Metsker Maps and Pioneer Maps. The Forest Service offices, ranger stations (limited supplies), and *The Mountaineers* clubhouse in Seattle (at a discount; also mail order).

Declination

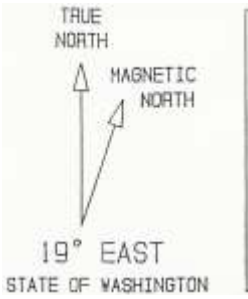
The **DECLINATION** is the angle between true north and magnetic north. The amount of declination in a given area depends on the location of that point on the earth. Where true and magnetic north are the same direction, then the declination is zero. In North America, zero declination runs roughly from west of Hudson Bay down along eastern Lake Michigan to the Atlantic coast of Georgia. At any point on the West Side of this line, the compass needle will point east of true north. This is called **EASTERLY** declination (see fig. 9). Conversely, at any point on the East Side of this line, the compass needle will point west of true north. This is called **WESTERLY** declination (see fig. 10). In North America, the declination varies from 30 degrees east in Alaska to 30 degrees west in Labrador.

Declination is complex – you can't guess about what the declination is in a particular place. It also changes – about a degree every five or six years, here, right now – so an old map will have inaccurate values. You can find the current declination of any place on earth, for any time, by visiting NOAA's National Geophysical Data Center Web site at http://www.ngdc.noaa.gov/geomag/declination.shtml.

Using a Compass

Bearings

The direction from one point to another, on a map or in the field, is called a **BEARING**. If the direction is relative (in reference) to true north, such as a map, it is a true bearing. If the direction is relative to magnetic north, such as in the field, it is a magnetic bearing (see figures below).



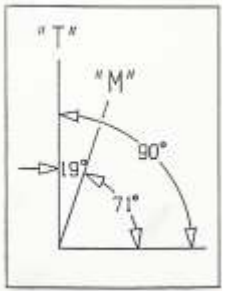
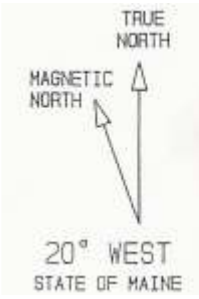


Figure 9



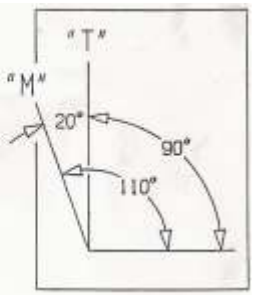


Figure 10

Bearings (direction of travel and/or sighting on an objective / landmark) are given a number. The number of degrees starting from "(0" zero at north and going around clockwise to)" 360" north again determines this. The bearings are expressed as three digit numbers (i.e. 008, 075, 247, etc).

When the compass is used with a map (true bearings) and in the field (magnetic bearings), an adjustment must be made to allow for the declination. The amount of declination and whether it is easterly or westerly is given on topographic maps. The magnetic bearing is determined by either subtracting or adding the declination from the true bearing. If the declination is easterly - subtract; westerly - add (see figs. 9 & 10). To avoid a misunderstanding on the direction, the bearing number is further clarified by adding a "**T**" for true bearing and an "**M**" for magnetic bearings (i.e. "100T/081M for a 19 degree E declination; "200T/210M for a 10 degree W declination).

The principle / cardinal directions are:

Bearing (True degrees)	Cardinal Direction
0° and 360°	North (N)
45°	Northeast (NE)
90°	East (E)
135°	Southeast (SE)

Bearing (True degrees)	Cardinal Direction
180°	South (S)
225°	Southwest (SW)
270°	West (W)
315°	Northwest (NW)

NOTE: IF THE COMPASS HAS AN OFFSETTING MECHANISM FOR DECLINATION, SET TO ZERO (0) BEFORE DOING THE FOLLOWING STEPS.

Bearing to an Object (Field Bearing)

You would use this to find the direction of an object to either: use it later on a map to identify the object or to follow the bearing toward the object. This might be useful if weather is coming in and you can point toward where you started – the bearing could help you get back in poor visibility.

How to:

1. Point the direction arrow toward the object, holding the compass level, and sighting along the sight lines.
2. Twist the dial until the magnetic needle lines up with the orienting arrow.
3. Make sure the compass is still level and pointing toward the object, and adjust the dial until you're satisfied.
4. Read the bearing in degrees by looking at the tick on the dial at the direction pointer.

Field Bearing onto a Map

You would use this to put a bearing you've acquired in the field onto the map to see what the object was named or to see what else might lie between your position and the object.

How to:

1. With your compass set to the bearing you took, put it on the map.
2. Line up one of the straightedges with your position or a known landmark.
3. Twist the whole compass, keeping the straightedge on your point, until the north on the graduated dial points to the map's true north. The meridian lines will also point true north.
4. Follow the straightedge to the destination on the map.

Bearing from a Map

You would use this to learn what direction to travel from a starting point to a destination, or to learn in which direction a particular named object lies from your position.

How to:

1. Put your compass on the map.
2. Line up a straightedge so that both your starting point and the destination lie along it.

3. Twist the graduated dial, keeping the straightedge on both points, until the north on the graduated dial points to the map's true north and the meridian lines also point true north.
4. Read the bearing in degrees by looking the tick on the dial at the direction pointer.

Orient the Map

This is useful for a quick assessment of your situation and for generally "orienting" yourself to the items on the map and what they look like in the field.

How to:

1. Set the graduated dial so that north lines up with the direction pointer.
2. Line up one of the compass's straightedges so that it's lined up with a north-south line on the map.
3. Keeping the map and compass pressed together, so they don't shift relative to each other, turn the map until the compass needle is lined up in the orientation arrow.
4. The map is now oriented to the earth. Things to the right of the map are east, to the left, west.

Triangulation

Triangulation is the process of finding two or more lines that intersect on the map, so that where they intersect is your location. Triangulation is sometimes referred to as "cross bearings", or "intersection". It requires a minimum of known two lines, which can be compass bearings to two known landmarks, or they can be "lines" in the terrain: an elevation contour line, a ridge top, a creek or gully, a power line, a shoreline, a road, etc. The closer the two lines are to right angles to each other, the more accurate the positioning you get from triangulation. The most common landmarks are two peaks.

How to:

1. Take a bearing to the first object. See *Bearing to an Object (Field Bearing)* above.
2. Transfer the bearing line to the map. See *Field Bearing onto a Map* above. **Note: The map does not have to be oriented to do this. Disregard the magnetic needle; the compass is only used as a protractor.**
3. The point at which the bearing was taken is somewhere along the line formed by the straightedge.
4. Repeat steps 1 and 2 for the second known landmark. Your location is near where the lines or bearings cross on the map.

APPLICATION FOR GRADUATION

Olympia Mountaineers Wilderness Skills Course

____ I wish to apply for graduation from the 2010 Wilderness Skills Course.

____ I wish to apply for an extension in order to graduate from the 2011 Wilderness Skills Course.

Mail this application to the address below by October 1, 2010

Name: _____

Address: _____

City: _____ Zip: _____

Phone: _____ Email: _____

I have met the following requirements (please check):

_____ Attended all four class lectures

- ☐ **Ten Essentials – Equipment –Boots – Clothing**
- ☐ **Wilderness Ethics – Nutrition – Conditioning – Injury Prevention**
- ☐ **Places to Hike – Hazards – Weather**
- ☐ **Navigation**

_____ Completed the Outdoor Workshop

_____ Completed an Experience Trip (Please indicate sponsoring branch if other than Olympia)

Destination (Hike, Snowshoe, Backpack, Scramble, Climb, or Paddle)	Date	Leader's Name (Branch)
_____	_____	_____

My recommendation for the Trip Leader of the Year is: _____

Complete and mail this application by October 1, 2010, to:

The Olympia Mountaineers
WS Graduation Application
3110 Hampton Drive SW
Olympia, WA 98512

OR
e-mail to: jimfrenchwa@comcast.net

CONGRATULATIONS!