

THE

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# CHEMEKETANS

we get outside



## CLIMB SCHOOL HANDBOOK



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*Images and information in this handbook have been gathered from a variety of sources, including Mountaineering: The Freedom of the Hills by The Mountaineers and Glacier Mountaineering: An Illustrated Guide to Glacier Travel and Crevasse Rescue by Andy Tyson and Mike Clelland. This handbook is for instructional purposes only and not intended to be sold or distributed outside of the Chemeketan Climb School.*

## A NOTE ABOUT SAFETY

Safety is an important concern in all outdoor activities. No book can alert you to every hazard or anticipate the limitations of every reader. Therefore, the descriptions of equipment and techniques in this handbook are not representations that a particular tool or technique will be safe for you or your party. When you participate in the activities described in this handbook, you assume the responsibility for your own safety. Keeping informed on current conditions and exercising common sense are the keys to a safe, enjoyable outing.

The Chemeketans is an outdoor recreation club, not a mountain guide service. Chemeketan climb leaders and assistants are climb facilitators, helping to organize and lead climbs, not climbing guides with appropriate certifications and professional liability insurance.

Climb participants should:

1. Reserve their judgment and climb in an alert and questioning manner, not blindly placing their faith in the judgment of the leader and assistants.
2. Ask questions when they do not understand what is going on.
3. Notify the leader if they feel unsafe and require a belay or if they feel the climb is too dangerous for them to continue.
4. Climb as a team recognizing that there is safety in numbers. Participants are expected to stop at all trail junctions and allow stragglers to regroup before proceeding.

Climb participants must sign a liability waiver whereby they:

1. Agree to assume all risks associated with the activity including travel to and from the activity.
2. Understand that Chemeketan climbs are potentially dangerous activities, and that accidents or illness can and do occur in remote locations where access to qualified emergency medical personnel is not readily available.
3. Agree to pay for their own medical and/or rescue expenses, whether or not authorized by the participant in the event of accident or illness.

## CHEMEKETAN CLIMB SCHOOL



Welcome to the Chemeketan Climb School. This is a basic school, during which you will learn about the equipment and techniques necessary for you to participate safely as a member of a climbing team under the leadership of an experienced climb leader. Although you are free to climb on your own after completing the climb school, we do not believe that what you learn in this school is enough to enable you to safely climb independently. Instead, we encourage you to climb during at least your first year of climbing with the Chemeketans or another climbing club, or at least with friends who are experienced (and safe) climbers. However, the choice is up to you.

The Chemeketan climb leaders are all volunteers who enjoy sharing their knowledge and love of the mountains with others. Most leaders have many years of experience climbing and leading climbs for the Chemeketans. They will do their best to teach you the basic techniques of safe climbing, and will be happy to answer any questions you may have on climbing equipment, techniques, routes, etc.

We hope that you will find the Chemeketan Climb School to be an interesting, challenging, and rewarding experience, and that you will continue to use the knowledge and skills you have learned to safely enjoy the scenic and challenging mountain environment of the Pacific Northwest.

**CHEMEKETAN CLIMB SCHOOL ITINERARY****First Classroom Session**

- 5:00 PM – Student Registration and Climbing Slide Show
- 5:45 PM – Welcome to Climb School and Info
- 6:00 PM – An Introduction to Climbing
- 6:50 PM – Break
- 7:00 PM – The Gear: Ropes, Biners, Harnesses and Belay/Rappel
- 7:40 PM – Pod Break-out: Intros, Cords and Learning the Knots,
- 8:50 PM – Homework and Equipment Review

*Homework:*

- Practice tying knots
- Purchase carabiners, belay device and approved climbing harness. Bring to second classroom session along with accessory cords and practice rope
- Please review handbook, including climbing signals and terms in glossary
- Practice tying knots

**Second Classroom Session**

- 5:00 PM – **Optional** Q & A with Climb Leaders, Climbing Slide show
- 5:30 PM – Participating in Chemeketan Climbs and Personal Responsibility
- 6:10 PM – Packing for a One-day Snow and Alpine/Rock Climbs
- 6:50 PM – Break
- 7:00 PM – More Gear: Ice Axe & Crampons
- 7:25 PM – Pod Break-out: Knot Review, Prusiks, Harnesses, More Knots, Belay
- 8:50 PM – Field Session Schedule, Logistics and Gear

**Third Classroom Session**

- 5:00 PM – **Optional** Q & A with Climb Leaders, Climbing Slide show
- 5:30 PM – Nutrition & Fitness for Climbing
- 5:50 PM – Appropriate First Year Climbs & How to Get There
- 6:20 PM – Packing for Climb School Rock & Snow Day
- 6:40 PM – Break
- 6:50 PM – Demos: Rappel & Clipping
- 7:10 PM – Pod Break-out: Harness Up, Tie In, Use Them Knots & Get Clipping
- 8:30 PM – Field Sessions Logistics, Schedules, Car Pooling

**Saturday - ROCK DAY**

- 8:00 AM – Meet at Columbia Hills State Park Rock Climbing Area
- 8:30 AM - Hike into climbing area
- 9:00 AM - Begin Rock Climbing Skill Stations
- 12:30 PM – Lunch Break
- 5:00 PM - Drive to Columbia Hills State Park Campground and set up tents

**Sunday - SNOW DAY**

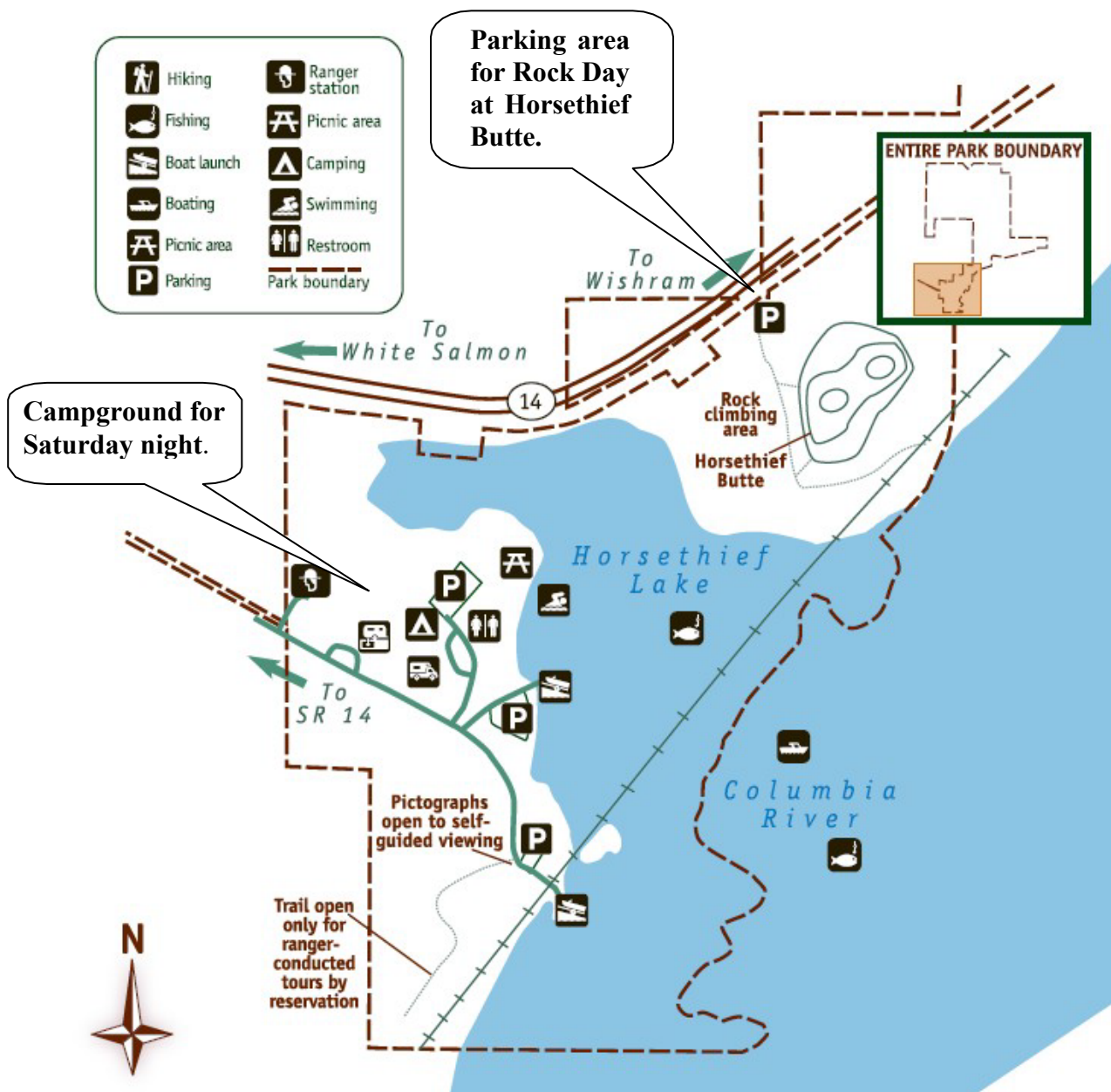
- 6:00 AM - Drive to Timberline Lodge (on your own for breakfast)
- 9:00 AM – Gather with pods in Timberline Lodge parking lot
- 9:20 AM – Begin hiking into snow skills practice area
- 11:30 AM – Lunch Break
- 3:00 PM – Hike out to parking lot
- 3:30 PM – Presentation of Climb School Certificates at Timberline Lodge
- 4:30 PM – Depart Timberline

**GETTING TO COLUMBIA HILLS STATE PARK / HORSETHIEF BUTTE**

**Please carpool with your pod-members or classmates!**

**Parking at the climbing area is extremely limited!**

Drive east or west on I-84, take exit #87 and drive north on U.S. 197 across the Columbia River bridge. Continue north about 2.5 miles to SR 14, and turn right, heading east. The park is located at milepost 85. For Rock Day on Saturday morning, head straight to the Horsethief Butte Rock Climbing area labeled below.

**Map of Columbia Hills State Park / Horsethief Butte**

**CHEMEKETAN CLIMB SCHOOL CHECKLIST****Water**

- ☐ **Sat**-2 quarts in field, 1 quart in car
- ☐ **Sun**-2 quarts in field, 1 quart in car  
(no water on site of field sessions)

**Food**

- ☐ **Sat**-snacks, sack lunch, large
- ☐ **Sat**-dinner, on own
- ☐ **Sun**-breakfast on own
- ☐ **Sun**-lunch, sack lunch, large
- ☐ **Sun**-snack for drive home

**Saturday Clothing (Rock Day)**

- ☐ Long sleeve shirt
- ☐ Loose-fitting long pants
- ☐ Lug soled boots or approach shoes/trail running shoes
- ☐ Hat, sun
- ☐ Jacket, warm synthetic
- ☐ Windbreaker
- ☐ Hat, warm
- ☐ Rain gear
- ☐ Sunglasses
- ☐ **NO COTTON CLOTHING!**

**Sunday Clothing (Snow Day)**

- ☐ Boots, waterproof
- ☐ Gaiters (optional)
- ☐ Gloves or mittens, warm & spares
- ☐ Hat with visor (optional)
- ☐ Hat, warm
- ☐ Jacket, rain
- ☐ Jacket, warm synthetic
- ☐ Long underwear – polypro/wool
- ☐ Long sleeve base layer – polypro/wool
- ☐ Nylon shorts (optional)
- ☐ Pants, rain
- ☐ Pants - warm wool or fleece
- ☐ Socks - liner & spares
- ☐ Socks, thick wool & spares
- ☐ Sweater - wool or fleece
- ☐ Sunglasses
- ☐ **NO COTTON CLOTHING!**

**Climbing Gear**

- ☐ 2 carabiners, oval
- ☐ 3 carabiners, locking
- ☐ Belay/rappel device/ATC
- ☐ Helmet
- ☐ Ice Axe
- ☐ Day Pack
- ☐ 3 prusik cords (6', 8' and 10' of 5-6mm static cord) – provided in class
- ☐ Rock climbing shoes (optional)
- ☐ Sewn Seat Harness
- ☐ Sit pad, ensolite (optional)

**Handy Bag**

- ☐ Camera (optional)
- ☐ Chap stick
- ☐ Duct tape
- ☐ First aid kit
- ☐ Handkerchief
- ☐ Head lamp/extra battery & bulb
- ☐ Pocket knife
- ☐ Sunscreen
- ☐ Tissue paper

**Camping**

- ☐ Sleeping bag
- ☐ Sleeping pad
- ☐ Tent (shared)

**Miscellaneous**

- ☐ Oregon Sno-Park Permit (\$25/yr, \$9/three day, \$4/one day), for each vehicle.



## CHEMEKETAN MEMBERSHIP INFORMATION

The Chemeketans is a not-for-profit outdoor organization founded in 1928. The Chemeketans draw their name from the Native American word "Chemeketa", which roughly translates as "meeting place." It was the name that Indigenous peoples used for what is now the Salem area. This is now the home base for the Chemeketans. The Chemeketans organize hiking, backpacking and climbing trips, as well as cross-country ski or snowshoe outings, bicycle trips, canoe trips, picture nights, and trail maintenance activities.

### **BENEFITS**

All Chemeketan members can participate in scheduled activities if any required prerequisites have been completed. Guests and non-members can often participate as well. The club also owns a mountain cabin which can be reserved by members at a decreased rate.

In addition, members receive a monthly bulletin of events and trip reports, a prospectus of yearly activities, and a membership roster. Members pay substantially less to attend the Annual Outing, are eligible for discounts at numerous local outdoor sporting goods stores and can participate in club elections and other votes.

### **MEMBERSHIP APPLICATION:**

Membership in the Chemeketans is contingent on the completion of two "qualifying trips". Successful completion of the Chemeketan Climb School will satisfy both "qualifying trip" requirements. Normally, application for membership is made after completing the "qualifiers". However, in this special situation, the membership secretary will circulate membership applications during the first classroom session so that students can complete the membership application in advance. Those students who do not successfully complete the Chemeketan Climb School may still pursue membership in the club by completing two qualifying hikes and applying for membership before October 1.

There are no age requirements for Chemeketan membership; however, persons under 18 years of age are Junior Members. Junior Members have the advantage of paying less but they do not have voting rights. They enjoy all the other benefits of membership.

Climb School students who are currently Chemeketan members receive a discount to attend Climb School.

### **DUES**

Annual membership dues are \$20 for each adult and \$3 for each junior member.

## CHEMEKETAN CLIMBING PROGRAM

The Chemeketan climbing program provides a variety of activities, training, and climbs ranging from those suitable for first year climbers to more technical climbs for experienced mountaineers. All climbs on the schedule, including Climb School, are qualifying trips for Chemeketan membership. Completion of the Chemeketan Climb School, or an equivalent climb school experience as approved by the leader of each individual climb is required for participation in Chemeketan climbs.

Chemeketan climbs are typically limited in party size. All wilderness area activities are limited by the Forest Service to no more than twelve participants in a group. Climbers interested in a particular climb should contact the leader as soon as possible to sign up in advance of the climb. A list of scheduled Chemeketan climbs is posted on the Climb page of the club's website at [www.chemeketans.org](http://www.chemeketans.org). For details about a specific climb, contact the leader listed for the climb.

### CHEMEKETAN CLIMBING AWARDS

The purpose of the Chemeketan climbing award system is to recognize those members possessed of the stamina, will power, and enterprise necessary to climb to the top of a difficult mountain. The Chemeketan climb awards are described more comprehensively on the club website.

Awards are given on request for certain climbs, as follows:

**First Ascent:** A climber's first ascent of any Chemeketan award peak.

**Santiam Peaks Award:** Mt. Jefferson, Three Finger Jack and Mt. Washington.

**Guardian Peaks Award:** Mt. Hood, Mt. St. Helens and Mt. Adams.

**Nine Oregon Peaks Award:** Mt. Hood, Mt. Jefferson, Three Fingered Jack, Mt. Washington, North, Middle and South Sisters, Broken Top and Mt. Thielsen.

**Eighteen Northwest Peaks Award:** The nine Oregon Cascade Peaks plus Mt. Shasta, Mt. St. Helens, Mt. Adams, Mt. Rainier, Mt. Stuart, Mt. Olympus, Glacier Peak, Mt. Baker and Mt. Shuksan.

All climbs applied toward a Chemeketan climbing award must be scheduled Chemeketan climbs except for the 18 Peak Award for which up to six of the climbs may be made under the auspices of a fellow Federation of Western Outdoor Clubs (FWOC) member club.

*The current climb schedule and more information about the climbing program can be found on the Chemeketan web site: <http://www.chemeketans.org/climbing.asp>*

## OTHER CHEMEKETAN EDUCATIONAL OPPORTUNITIES

### **WILDERNESS FIRST AID**

This 18-hour Wilderness First Aid course takes place over a full weekend at Silver Falls State Park. The course covers first aid skills and decision-making using realistic emergency medical scenarios as might be encountered on a climbing, hiking or backpacking trip in the Cascades. It is a fun, intense, hands-on course that includes outdoor scenarios in dark, cold, wet, winter conditions. Lead Instructor: Mike Niemeyer, Wilderness EMT.

**Prerequisites:** Must be 18 years of age or older, must have the ability to lift 40 lbs., and have current CPR certification.

### **CHEMEKETAN ROUTE FINDING SCHOOL**

Route Finding School is a three-part series of workshops focused on learning and practicing map, compass and GPS skills. Part one “Using Maps” is a three-hour lecture focused solely on understanding the enormous amount of information available in a topographical map. Parts two and three focus on compass and GPS skills (respectively) and consist of equal parts lecture and field session practice. Field sessions are held at Salem’s Riverfront Park. Participants are expected to bring their own compass but need not own their own GPS. Participants who do not own a GPS receiver will be partnered with someone who does.

### **INTRO TO ROCK CLIMBING AT SMITH ROCK**

This is an introductory course in the vertical world of rock climbing and is a good ‘next step’ for beginner rock climbers who have completed Climb School. The main objective of this outing is to learn one of the most important aspects of climbing - BELAYING. Participants will review the mechanics and the ABC’s (Anchor, Belayer, Climber) of belaying climbers on top-roped climbs of varying difficulty. Participants will also learn more about gear needed for the two main styles of rock climbing (trad and sport) in brief discussion and demos. The atmosphere is safe, fun, and very supportive. Leaders and helpers will be coaching and backing up all participants.

**Prerequisites:** Completion of Climb School, knowledge of common climbing language and know how to tie basic knots used in climbing.

### **INTRO TO SPORT CLIMBING AT SMITH ROCK**

The goal of this seminar is to teach you how to set up top rope anchors on rock climbs that have bolted anchors at the top of the route. We will then teach you the safe and proper way to lead a bolted sport climb and use the top rope anchor that was constructed to climb the route and rappel down the route when finished.

The three-hour lecture will be open to anyone who wants to attend. Weekend training will be limited to 12 students but can change depending on student to leader ratio. During the weekend field session, each leader-assistant team will be assigned three or four students for the day and gear will be divided. Groups will head out and do their training and be back to the assembly area in the afternoon. Additional climbing can be done after each individual has been released from the hands-on training.

**Prerequisites:** The weekend training is open to students who have taken Clim School. Students are expected to know how to belay another climber and rappel using a belay device of their choice, use common climbing language and know how to tie basic climbing knots. Participation in Intro to Rock Climbing at Smith Rock is recommended.

### **INTERMEDIATE SNOW SKILLS**

This is an opportunity for climbers of all levels to test and improve their fitness and add to their snow climbing skills. Depending on the group's experience and the snow conditions, these skills may include use of the ice axe on steep snow, crampon technique, "hanging" belays, building and belaying off of snow anchors, introduction to avalanche assessment (e.g., snow pits), or z-pulley (rescue). Since this is a training exercise, and we are not venturing too far off the Palmer snowfield this trip will still go in less than perfect weather.

**Prerequisites:** The weekend training is open to students who have taken basic climb school. Students are expected to know how to belay another climber and rappel using a belay device of their choice, use common climbing language and know how to tie basic climbing knots.

### **INTERMEDIATE ICE SKILLS**

We will spend two days on Mt. Hood's Eliot Glacier practicing ice axe and crampon techniques. The practice sessions give the beginning climber an understanding of what their equipment can do and make them more confident when these skills are needed on a high angle glacier. The focus of Day 1 is on ice climbing skills and safe and efficient travel (roped and un-roped) over steep, icy terrain. Day 2 is more vertical, providing learning opportunities such as: building a variety of anchors (including ice screw placements and V-thread technique), simulating crevasse self-rescue by being lowered into a crevasse and using their prussic slings to climb out of a crevasse and using two-tooling techniques while on top-rope belay. Participants can opt out of any activity and still attend the course.

**Prerequisites:** Completion of Clim School, knowledge of how to belay another climber, ability to rappel using a belay device of their choice, knowledge of common climbing language and ability to tie basic climbing knots.

## AN INTRODUCTION TO CLIMBING

There are two main types of climbing: Mountaineering and Cragging.

**Mountaineering** usually involves longer approaches (sometimes multi-day) and climbing at higher altitudes. Types of Mountaineering:

1. Glacier Climbs: Climbing / Hiking on glaciated peaks using an ice axe and sometimes needing crampons, roped teams and set protection.
2. Alpine Rock: Climbs, usually 5<sup>th</sup> class, well above the alpine tree line at higher altitudes. Mostly using set roped fixed lines or belayed travel.
3. Mixed Climbs: Are just that. They are a combination of the two above.

**Cragging** is more accessible, with climbing areas usually a short hike from the car. Craggs typically have multiple climbs of varying difficulties. Types of Cragging:

1. Sport Climbing: A style of rock climbing that relies on permanent fixed protection, including bolts along the route and oftentimes fixed anchors.
2. Traditional / Trad: A style of rock climbing that relies on the lead climber to place removable protection, usually removed by the second climber, as they climb.
3. Ice Climbing: A very specialized form of climbing using front point crampons, dual ice tools and specialized protection devices to ascend frozen waterfalls and ice formations.

Traditional and ice climbing can be an integral part of some mountaineering.

### **CLIMBING CLASSIFICATION SYSTEMS**

The rating of a climb is a subjective indication of the technical difficulty of the route or pitch to which it applies. All rating systems (apart from the British system) use the difficulty of the crux (the most difficult move or series of moves) to determine the rating, at least in principle. The rating may be increased if a climb is sustained (i.e., has a very long series of very difficult moves).

#### **Chemeketan Climbing Classification System**

Each climb on the Chemeketan climb schedule is rated according to type and difficulty. For example, a climb rated S-1 would be a relatively easy snow climb (e.g., South Sister in winter); R-2 would be a fairly difficult rock climb (e.g. Mt. Washington, West Ridge); and M-3 would be a difficult mixed climb (e.g. Mt. Shuksan, North Face).

Type	Description
<b>Snow (S)</b>	Primarily a snow climb, usually involving moderate to steep snow and crevassed glaciers where use of an ice axe and crampons are necessary.
<b>Rock (R)</b>	Primarily a rock climb where climbers are placed on belay or use a fixed line. Rappelling may also be necessary.
<b>Mixed (M)</b>	A mixed rock and snow climb in which both rock and snow are likely to be encountered during the climb. Knowledge and techniques applicable to both types of climbing are required.
<b>Unrated (U)</b>	No technical climbing skills are required. However, it is still considered a climb since participants must travel above tree line where off-trail navigation is necessary (e.g., South Sister, south side route in summer conditions).

Difficulty	Minimum Eligibility Requirements
<b>Level 1</b>	Chemeketan Climb School or equivalent (Mazama Basic Climb School, Mountaineers, Rainier Mountaineering, Inc., Santiam Alpine Club, etc.)
<b>Level 2</b>	Chemeketan Climb School or equivalent and successful completion of a level 1 difficulty climb of the same type (Snow, Rock or Mixed).
<b>Level 3</b>	The individual climb leader will determine the level of climbing skill and judgment required for a route of this level of difficulty.

### The North American Grading System

The North American Grading System identifies the typical amount of time required to complete a route. This time is based on a team of average climbers using normal techniques.

Grade I	Requires 1-2 hours
Grade II	Requires half a day
Grade III	Requires most of a day
Grade IV	Requires a very long day
Grade V	Requires an overnight stay on the route
Grade VI	Requires a few days
Grade VII	Expedition

### Yosemite Decimal System

The Yosemite Decimal System is a grading system for rock climbs which is commonly used in the United States. The basic concept behind the Yosemite Decimal System is simple and utilizes the following format: Class / Sub-Grade / Suffix / Danger-Factor.

Example: 5.11b R (5 is Class / 11 is Sub-Grade / b is Suffix / R is Danger Factor)

There are five classes in the Yosemite Decimal System, with the class being determined by the hardest or 'crux' move on the climb.

Class 1	Walking on an even trail with low chance of injury
Class 2	Hiking up steep trail which may include simple scrambling, occasional use of hands, but little potential danger.
Class 3	Scrambling with increased exposure. A rope can be carried but is usually not required.
Class 4	Simple climbing, with exposure. A rope is often used. Natural protection can be easily found.
Class 5	Climbing on exposure terrain. Most parties will want a rope.

The sub-grade can range from 1 to a theoretically infinite number (today the highest number is 15). The number is increased when a 'harder' climb is developed.

5.1 - 5.6	Easy
5.7 - 5.9	Intermediate
5.10 - 5.11	Difficult
5.12 - 5.13	Very Difficult
5.14 - 5.15	Expert

An example of a class and sub-grade in the Yosemite Decimal System would be a 5.9 rock climb where '5' is the 'Class' and '9' is the 'Sub-Grade'.

A suffix is often found on grades 5.10 and higher. The suffix can use an alphabetical system (a, b, c, d - with a 5.10a being an easy 5.10 and 5.10d being a very hard 5.10) or a +/- system (with a 5.10- being an easy 5.10 and a 5.10+ being a hard 5.10).

A danger factor may also be included and is usually marked as an 'R' or 'X', with 'R' noting run-out and 'X' noting significant danger and possibility for injury.

## WHAT TO BRING ON A CLIMB

### TEN ESSENTIALS

Always bring the Ten Essentials:

1. NAVIGATION: Map, compass, possibly a GPS
2. HYDRATION: Water, container, and either filter or other treatment method
3. NUTRITION: Food and extra food
4. SUN PROTECTION: Sunscreen, sunglasses, hat, lip balm with SPF
5. INSULATION: Hat and gloves, lightweight jacket, extra layers
6. FIRE/WARMTH: Lighter or matches, fire starter or stove and fuel
7. ILLUMINATION: Headlamp or flashlight, with extra batteries and bulbs.
8. FIRST AID: (For You) Bandages, over the counter medicines, duct tape, blister material/moleskin, safety pins and any other personal items.
9. SHELTER: Emergency blanket or shelter in case you are out longer than expected
10. REPAIR KIT / TOOLS: Knife/multi tool, duct tape, zip ties, shoelaces, safety pins, plastic buckles, straps, and parts for equipment such as tent, stove, crampons, snowshoes, and skis etc.

Some lists have included an 11<sup>th</sup> essential. COMMUNICATION: Two-way radios, Cell phone, and other devices can help get you out of trouble. If nothing else a good loud Signal Whistle can be heard much farther than any person can yell for help.



**RECOMMENDED FOR SNOW CLIMBS****Food & Water**

- ☐ wide mouth bottles - 2, quart-sized
- ☐ food for full day that can be eaten in short stops
- ☐ extra food

**Clothing**

- ☐ boots - heavy leather or plastic
- ☐ gaiters
- ☐ gloves or mittens - warm
- ☐ sun hat - covers neck & ears
- ☐ hat/beanie - warm
- ☐ mountaineering sunglasses
- ☐ jacket - waterproof breathable
- ☐ jacket - warm synthetic
- ☐ long underwear - polypro
- ☐ long sleeve undershirt - polypro
- ☐ nylon shorts - breathable nylon
- ☐ pants - waterproof breathable
- ☐ pants - warm wool or fleece
- ☐ liner socks & spares
- ☐ socks - thick wool & spares
- ☐ sweater, wool or fleece
- ☐ NO COTTON CLOTHING

**Climbing**

- ☐ Belay/rappel device/ATC
- ☐ carabiners, oval - 2 or more
- ☐ carabiners, locking - 2 or more
- ☐ helmet
- ☐ ice axe
- ☐ pack
- ☐ prusik slings
- ☐ harness
- ☐ crampons
- ☐ ski poles - optional
- ☐ sit pad, ensolite - optional
- ☐ snow shovel - optional

**Handy Bag**

- ☐ camera - optional
- ☐ chap stick - optional
- ☐ duct tape
- ☐ first aid kit
- ☐ handkerchief
- ☐ head lamp/extra battery & bulb
- ☐ pocketknife
- ☐ sunscreen
- ☐ tissue paper
- ☐ matches - waterproof
- ☐ fire starter / candle
- ☐ utility cord
- ☐ whistle – easy to access
- ☐ spare gloves/mittens
- ☐ watch
- ☐ altimeter - optional
- ☐ personal medications for 3 days
- ☐ compass
- ☐ map

**First Aid Kit**

- ☐ 6 adhesive bandages - 1"
- ☐ 6 butterfly bandages
- ☐ 4 gauze pads - 4" x 4"
- ☐ 1 gauze roll - 2" x 5 yd
- ☐ protective/surgical gloves
- ☐ adhesive tape
- ☐ scissors
- ☐ triangular bandage
- ☐ safety pins
- ☐ aspirin or equivalent
- ☐ moleskin

**RECOMMENDED FOR ALPINE ROCK CLIMBS****Food & Water**

- ☐ wide mouth bottles - 2, quart-sized
- ☐ food for full day that can be eaten in short stops
- ☐ extra food

**Clothing**

- ☐ boots, leather
- ☐ gaiters - optional
- ☐ gloves or mittens - warm
- ☐ hat - sun
- ☐ hat - warm
- ☐ jacket - waterproof breathable
- ☐ jacket - warm synthetic
- ☐ long underwear - polypro
- ☐ long sleeve undershirt - polypro
- ☐ nylon shorts - breathable nylon
- ☐ pants, waterproof breathable
- ☐ pants, warm wool or fleece
- ☐ socks, liner & spares
- ☐ socks, thick wool & spares
- ☐ sweater, wool or fleece
- ☐ NO COTTON CLOTHING

**Climbing**

- ☐ carabiners, oval - 2 or more
- ☐ carabiners, locking - 2 or more
- ☐ rappel/belay device/ATC
- ☐ helmet
- ☐ pack
- ☐ prusik slings
- ☐ harness
- ☐ rock shoes - optional

**Handy Bag**

- ☐ camera - optional
- ☐ chap stick - optional
- ☐ duct tape
- ☐ first aid kit
- ☐ handkerchief
- ☐ head lamp/extra battery & bulb
- ☐ pocketknife
- ☐ sunglasses/sunscreen
- ☐ tissue paper
- ☐ matches - waterproof
- ☐ fire starter/candle
- ☐ utility cord
- ☐ whistle – easy to access
- ☐ watch
- ☐ altimeter - optional
- ☐ personal medications for 3 days
- ☐ compass
- ☐ map
- ☐ mosquito repellent

**First Aid Kit**

- ☐ 6 adhesive bandages - 1"
- ☐ 6 butterfly bandages
- ☐ 4 gauze pads - 4" x 4"
- ☐ 1 gauze roll - 2" x 5 yd
- ☐ adhesive tape
- ☐ protective/surgical gloves
- ☐ scissors
- ☐ triangular bandage
- ☐ safety pins
- ☐ aspirin or equivalent
- ☐ moleskin

## FITNESS

Let's face it, mountaineering requires excellent physical fitness. A climber in poor physical condition can jeopardize the success and even the safety of the climb team. For this reason, it is essential that all climbers adequately prepare themselves physically before participating in a Chemeketan club climb. The mountaineer needs good leg strength and great cardiovascular endurance to sustain a steady pace uphill for many hours.

### **PREPARING FOR A MT. HOOD CLIMB**

To prepare your body for the physical demands of a Mt. Hood climb it is best to progress your fitness level by using a series of benchmarks or fitness goals. Even very fit people often underestimate what it takes to achieve the best training regime for mountaineering. Gaining elevation and wearing a pack are key elements to the athletic feat of mountaineering.

Some fitness goals to promote a successful and positive mountaineering experience include:

- Running three miles in less than 30 minutes.
- Running at a moderate pace for 45 minutes without a break.
- Cycling 30 miles including hills in less than two hours.
- Climbing Willamette University stadium steps for 30-45 minutes at a moderate pace. Start with a ten-pound pack and working up to a 25-pound pack.
- Hike the Mary's Peak North Ridge Trail (roundtrip) in three hours with a 30-pound pack.
- Hike the Mt. Defiance trail (roundtrip) in six hours with a pack weight comparable to the gear required for a Mt. Hood climb. Break to hydrate and eat about every 45-90 minutes.
- Another measure you could use anywhere includes hiking 1,000 feet an hour on any hike with an elevation gain of at least 2,000 feet.

**Specificity of Exercise** – The closer your exercise matches the movements, intensity and duration of a Mt. Hood climb the better. Running, cycling, and climbing stairs are good matches for the muscles used in climbing, while swimming and walking on a flat course are not. Given that it takes about seven hours of steady hiking uphill (5,000') to reach the summit of Mt. Hood, you should do at least one long workout (two hour minimum) every week. Ideally, this would be a long hike with significant elevation gain carrying a pack loaded with water, food and your climbing gear. Endurance training should play a key role in your training regime – long, slow, distance training.

**Overload Principle** – Vary the intensity or duration of your workouts. Do a very hard or very long workout at least once a week but no more than three times a week. Your body will adapt to the increased intensity or duration making you stronger. Duration is more important than intensity. If your training time is limited, increase the intensity, by going faster or carrying more weight, to overload the muscles.

**Hard/Easy Principle** – Do light workouts between the hard ones to give your body an opportunity to recover and get stronger. Working out hard every day invites injury and burnout.

**Progressive Resistance** – This doesn't apply to just weight training. Gradually add intensity or duration to your exercise routine. Over time your body will adapt and become stronger. Try to train five or six days a week, with a good balance of 'easy' and 'hard' workouts.

### **SAMPLE TRAINING PLAN**

Below is an example of a 10-week plan for reaching your peak fitness level.

<b>Week</b>	<b>Endurance Training Goal</b>	<b>Notes</b>
1	Long run or bike ride / Cross training	1.5 to 2.0 hours of continuous activity
2	2–4-hour hike with weighted pack	15-30 lb. pack, depending on your size
3	Long run or bike ride / Cross training	2.0 to 2.5 hours of continuous activity
4	3–5-hour hike with weighted pack	20-30 lb. pack, depending on your size
5	Long run or bike ride / Cross training	2.5 to 3.0 hours of continuous activity
6	4–6-hour hike with weighted pack	20-30 lb. pack, depending on your size
7	Long run or bike ride / Cross training	3.0 to 3.5 hours of continuous activity
8	6–8-hour hike with weighted pack	20-30 lb. pack, depending on your size
9	Easier run or bike ride / Cross training	1.0 to 2.0 hours of continuous activity
10	CLIMB!!	Rest up and hydrate prior to climb

### **TRAINING TIPS**

- Hikes should be on hilly terrain using boots and weighted pack (pack gets heavier each hike). Select and test the clothing, foods, fluids you will be using on your climb.
- On the odd weeks, your daily workouts should include some type of specificity and strength training, such as weights, stair steps, lunges, etc.
- When using specificity training, such as a stair step machine, make sure to use proper form and allow your legs to do the work (i.e., don't support yourself with your arms while using the machine).
- Don't cancel a training session because of inclement weather. You need to test your clothing, your body and your mind. The weather on your climb day may not be perfect.
- Rest and relaxation is an important component of any training program.
- Use the entire training period to work up to your peak fitness. Trying to cram months' worth of training into a few weeks will leave you unprepared at best...and injured at worst!

- Bottom line - **Proper training is the key to enjoying your climb. The goal is to have fun!**

### **TRAINING HIKE GOALS**

Training hikes are a good time to test out your gear and practice skills that you'll be using on a climb. In addition to physical conditioning, goals of a training hike should be:

1. Experiment, appreciate, test and learn
2. Teamwork - Safety, camaraderie and sharing
3. Fluid/Food Management - Drink before you're thirsty, eat before you're hungry
4. Clothing Systems - Learn what clothing system / layering strategy works best for you in different weather conditions
5. Gear Management - Find how to best load and carry your pack; get used to trekking poles
6. Body Management - After the hike, warm down, re-hydrate, stretch and recover
7. Skills Practice Work on your pacing, breathing, and skills (e.g., rest step)
8. Have Fun!

### **RECOMMENDED TRAINING HIKES**

#### **Columbia River Gorge**

Hike	Rating <sup>1</sup>	Drive <sup>2</sup>	Elev Gain	Dist <sup>3</sup>	Fee
Hamilton Mountain (via Beacon Rock)	Easy	197 mi	2,000 ft	7.6mi	No
Angel's Rest (via Bridal Veil)	Easy	153 mi	1,450 ft	4.4 mi	No
Wahkeena/Multnomah Falls	Easy	159 mi	1,600 ft	5.0mi	No
Dog Mountain	Moderate	210 mi	2,820 ft	5.8mi	Yes
Indian Point (via Herman Creek)	Moderate	191 mi	2,600 ft	8.0mi	Yes
Larch Mtn (via Multnomah Falls)	Difficult	159 mi	3,975 ft	13.4 mi	No
Ruckel Creek Trail (via Eagle Creek)	Difficult	180 mi	3,600 ft	9.2 mi	Yes
Mount Defiance	Difficult	206 mi	4,800 ft	11.8 mi	No

#### **Coast Range**

Hike	Rating <sup>1</sup>	Drive <sup>2</sup>	Elev Gain	Dist <sup>3</sup>	Fee
Saddle Mountain	Easy	230 mi	1,620 ft	5.2 mi	Yes
Mary's Peak (North Ridge Trail)	Mod/Diff	109 mi	2,300 ft	8 mi	No

## Willamette Forest

Hike	Rating	Drive	Elev Gain	Dist	Fee
Henline Mt. Trail	Mod/Diff	85 mi	2,100 ft	5.5 mi	Yes

## Mount Hood Area

Hike	Rating <sup>1</sup>	Drive <sup>2</sup>	Elev Gain	Dist <sup>3</sup>	Fee
Tom, Dick & Harry (via Mirror Lake) <sup>4</sup>	Moderate	186 mi	1,510 ft	6.0mi	Yes
Tilly Jane (via Cooper Spur)	Moderate	245 mi	1,570 ft	5.2mi	Yes
Salmon Butte <sup>4</sup>	Moderate	174 mi	2,840 ft	8.8mi	No
Devils Peak <sup>4</sup> (via Cool Creek Trail)	Moderate	175 mi	3,200 ft	8.2mi	No
Top of Palmer (via Timberline Lodge)	Difficult	206 mi	2,500 ft	4.0mi	Yes

## Portland Metro Area

Forest Park - Find hikes and maps at <http://explorepdx.com/forpark.html>

<sup>1</sup> Rating based on conditioning for mountain climbing...not the same rating as hiking books

<sup>2</sup> Round trip drive is from Salem

<sup>3</sup> Round trip distance from base to highest point and back

<sup>4</sup> Trails may not be passable until mid-to-late May

## FOOD & HYDRATION

When climbing, you want to keep up with the group, not slowing the group to the point that safety is compromised, to summit and return feeling OK, and to carry a fair share of group equipment. Keeping the body properly fueled is key to meeting these goals.

It's energy we want, and lots of it. (Climb season isn't necessarily the time to go on a diet.) Many climbers consider the calorie to weight ratio and bring the most filling, nutritious and easily digestible foods they can. For example, trail mix with dried fruit and nuts will pack much more protein and calories (i.e., energy) than carrot sticks. However, when you are on a climb it is not the time to overeat either. First, stomach problems are very unpleasant while climbing, and second, why carry more weight than you need to?

### HYDRATION

Dehydration produces the same symptoms as altitude sickness: First, malaise and loss of appetite, then headache, followed by increasing weakness and lessening of interest in the climb. Help to minimize the chance or severity of dehydration by pacing yourself and drinking water often. Carry adequate water and make sure it is readily available.

To stay hydrated, drink what you are used to – water or a sports drink - since climbing is not the time to experiment. If you need to refill your water at a natural source, consider the purity of the source. Also consider bringing a wide mouth bottle, which is easier to fill with snow.

To stay hydrated on a one-day trip, like a Mt. Hood climb, carry at least two full liters of water in leak proof bottles, such as Nalgene or Lexan. Dark urine or not needing to urinate in the morning means you're not drinking enough.

### FOOD

Running on flat ground, without a pack and heavy boots, burns 700 to 1,000 calories an hour, so consider how many calories are consumed in a 12-hour climb...

Eat a mixture of carbohydrates and fat while climbing. Carbohydrates supply energy the quickest, but are used in two hours or less, so snack on small amounts frequently. Complex carbohydrates provide a gradual energy source, compared to plain sugar. Carry snacking food in a pocket or pouch for easy access. Drinking water helps to metabolize your food, so be sure to stay hydrated on the trail.

Dinner is the time to replenish with a large meal. One sleeps much warmer and has more energy the next morning after eating a large dinner of carbohydrates, along with some form of fat. Dinner is also a good time to include some protein, although protein becomes more important on multi-day trips and is already included in many snacks (e.g., nuts, cheese, foil packs of tuna/chicken, etc.).

Food should taste good, so you want to eat it. Climbing is a time to eat like a kid again: candy bars, chocolate, salty nuts, peanut butter and jam sandwiches, lemon drops, M&Ms, etc. Make sure some source of food provides some salt, to replace salt lost in perspiration.

### **EMERGENCY FOOD AND WATER**

Emergency food should be lightweight, easily digestible, and store well for long periods (it hopefully stays in the bottom of your pack for many trips). It should not need cooking or be the sort of food you'd be tempted to gorge all at once. A combination of jerky, nuts, granola bars, granola, and dried fruit works well. A small aluminum cup is something you could melt snow in over a candle

### **ETIQUETTE**

Eat and drink quickly during breaks, so that you don't hold up the group, or cause others to get cold waiting for you.



## HYPOTHERMIA

### COLD KILLS IN TWO DISTINCT STEPS:

1. **EXPOSURE** - The moment your body begins to *lose heat* faster than it produces it; you are undergoing exposure. Two things happen:
  - a. You voluntarily exercise to stay warm.
  - b. Your body makes involuntary adjustments to preserve normal temperature in the vital organs, and you start shivering.

Either response drains your energy reserves. The only way to stop the drain is to reduce the degree of exposure. The time to prevent hypothermia is during the period of exposure and gradual exhaustion.

2. **HYPOTHERMIA** - Decrease in the body's core temperature
  - a. Cold reaches the brain depriving you of good judgment and reasoning power. You will not realize this is happening.
  - b. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia. You will lose control of your hands.
  - c. Exposure that continues until your energy reserves are exhausted may lead to stupor, collapse, and death.

### AVOIDING EXPOSURE & HYPOTHERMIA

1. **STAY DRY. When clothes get wet, they lose about ninety percent of their insulating value.** Wool and many new synthetic materials lose less. Wet cotton and down are worthless.
2. **BEWARE OF THE WIND.** A slight breeze carries heat away from bare skin much faster than still air. Wind drives cold air under and through clothing. *Wind refrigerates wet clothes* by evaporating moisture from the surface. WIND MULTIPLIES THE PROBLEMS OF STAYING DRY. If you have been in the water and are wearing a wet T-shirt, remove it and you will retain more heat. Direct sunlight on the skin helps in the warming process.
3. **UNDERSTANDING COLD.** Most hypothermia cases develop in air temperatures between 30 and 50 degrees. Most outdoor enthusiasts simply can't believe such temperatures can be dangerous. They fatally underestimate the danger of being wet at such temperatures. Fifty-degree **water** is unbearably cold. The cold that kills is **cold water** running down your neck and legs, and **cold-water** removing body heat from the surface of your clothes.
4. **TERMINATE EXPOSURE.** If you cannot stay dry and warm under existing weather conditions using the clothes you have with you, do whatever is necessary to be less exposed. Be smart enough to give up reaching the peak, or whatever you had in mind.
  - a. Get out of the wind and rain. Build a fire. Concentrate on making your camp or bivouac as secure and comfortable as possible.
  - b. Never ignore shivering. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
  - c. Make camp or get back to your vehicle.

5. **BEWARE OF EXHAUSTION.** Make camp while you still have a reserve of energy. Allow for the fact that exposure greatly reduces your normal endurance. You may think you are doing fine when the fact that you are exercising is the only thing preventing you from going into hypothermia. If exhaustion forces you to stop moving, however brief:
  - a. Your rate of body heat production instantly drops by fifty percent or more.
  - b. Violent, incapacitating shivering may begin immediately.
  - c. You may slip into hypothermia in a matter of minutes.
6. **APPOINT A LEADER.** Make the best protected and experienced member of your party responsible for calling a halt before the least protected member becomes exhausted or goes into violent shivering.
7. **DETECT HYPOTHERMIA.** If your group is exposed to WIND, COLD, OR WET, think hypothermia. Watch yourself and others for the symptoms:
  - a. Uncontrollable fits of shivering.
  - b. Vague, slow, slurred speech.
  - c. Memory lapses or incoherence.
  - d. Immobile, fumbling hands.
  - e. Frequent stumbling.
  - f. Drowsiness
  - g. Apparent exhaustion. Inability to get up after a rest.
8. **TREATMENT**
  - a. The victim may deny he/she is in trouble. Believe the symptoms, not the person. Even mild symptoms demand immediate treatment.
  - b. Get the victim out of the wind and rain.
  - c. Strip off *all* wet clothes.
  - d. Give him/her warm drinks. (Only small amounts)
  - e. Get him/her into dry clothes and a warm dry sleeping bag. Well-wrapped warm water bottles or rocks placed between the thighs and under the arms will hasten recovery.
  - f. If the patient is semi-conscious or worse:
    - i. Try to keep him/her awake. (Do not give hot liquids by mouth.)
    - ii. Leave him/her stripped. Put him/her in a sleeping bag with another person (also stripped) to transfer heat. If you can, put the victim between two heat donors. Skin to skin contact is a very effective treatment.

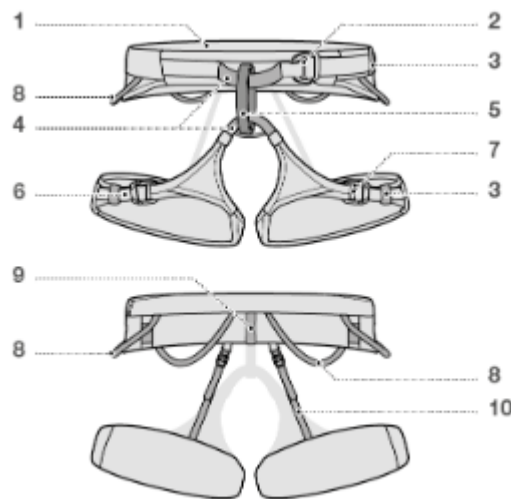
## Basic Climbing Equipment

### Rope

Modern climbing ropes are dynamic, meaning they stretch when a load is applied, and they have a kernmantle construction with a seriously strong core and a durable sheath around it. Make sure to only use UIAA rated ropes made specifically for climbing by reputable companies. The rope is your lifeline on the rock and in the mountains.

### Harness

Your Climbing harness should fit snug above the hip bones and be comfortable. Try on different styles, sizes and brands before choosing one since they will last several years if well taken care of. Choose from reputable brands that are rated by UIAA for strength and durability.



Source: Petzl

- (1) Waistbelt
- (2) Waistbelt adjustment buckle
- (3) Elastic keeper
- (4) Tie-in/Hard points
- (5) Belay loop
- (6) Leg loop strap
- (7) Leg loop adjustment buckles (for adjustable harnesses)
- (8) Gear loop
- (9) Rear loop for haul rope
- (10) Leg loop elastics.

### Carabiners

Carabiners are extremely strong gated links, used to connect climbing equipment. They come in a locking or non-locking form and in many shapes and sizes. Only use carabiners that are UIAA rated for climbing specifically.



Wiregate Non-Locking



Solid gate Non-Locking



Screw Locking



Twist Locking

## Belay/Rappel Device

The Belay/Rappel Device is a tool that allows you to control the movement of the rope. The primary principle is to use the shape of the metal to create a point of friction which slows the rope or stops it completely. Standard “tube” style belay devices require you to create this friction in the rope by bending the rope, where mechanically assisted devices are designed to automatically stop the rope when force is applied.



Standard "Tube" style belay device



Gri Gri assisted braking device

## Helmet

Climbing helmets are specifically designed to protect against rock fall and other specific climbing related forces. It should fit snug and be comfortable. You will be more inclined to wear it if it isn't cumbersome. Do not use a helmet designed for other sports.

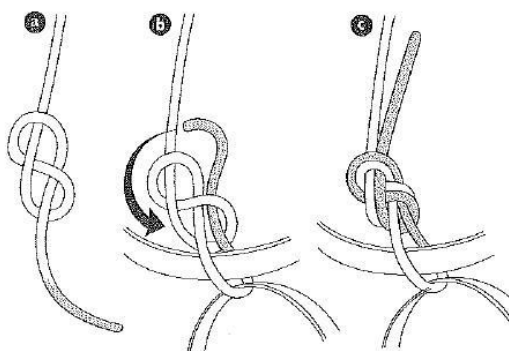
## CLIMBING KNOTS

Climbers use a variety of knots for different purposes. The following is a list of commonly used knots that climbers should know and be able to apply in the appropriate situations. It is important to know that knots change the strength of the rope, as shown in the table to the right.

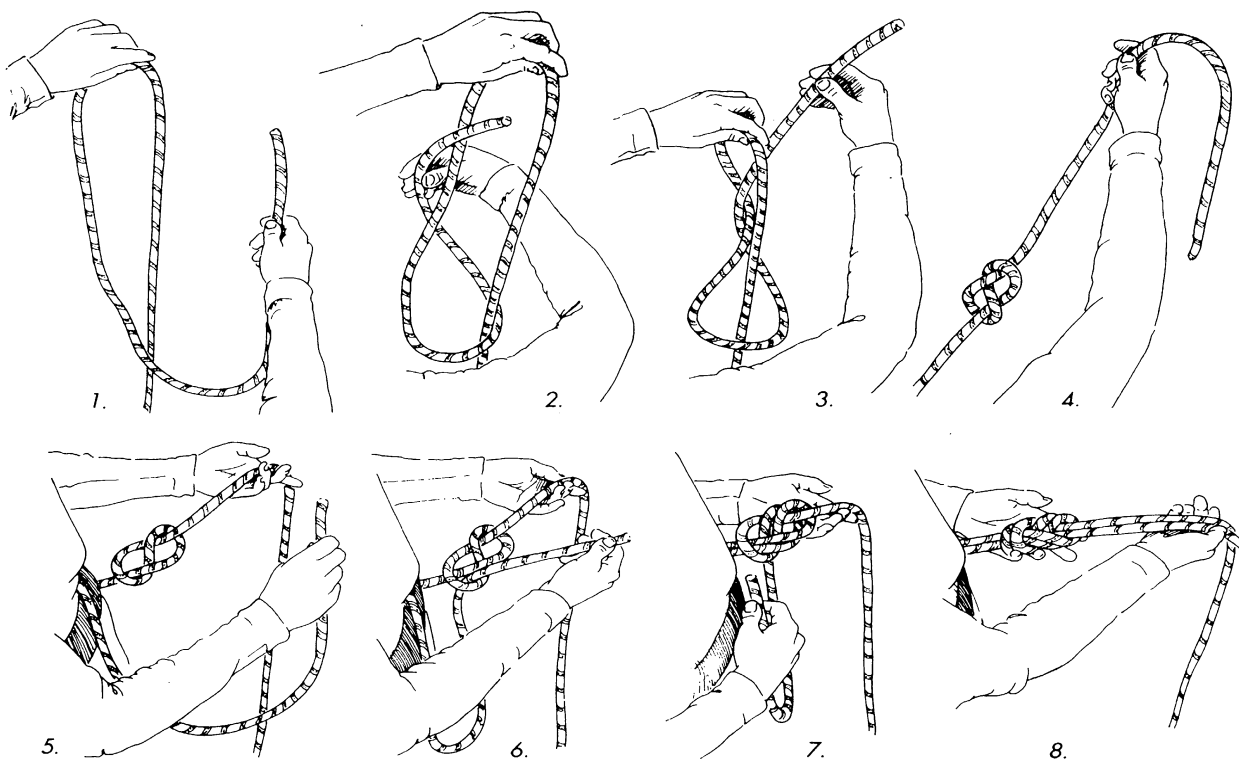
For more information on climbing knots, try the website Animated Knots by Grog:  
<http://www.animatedknots.com/indexclimbing.php>

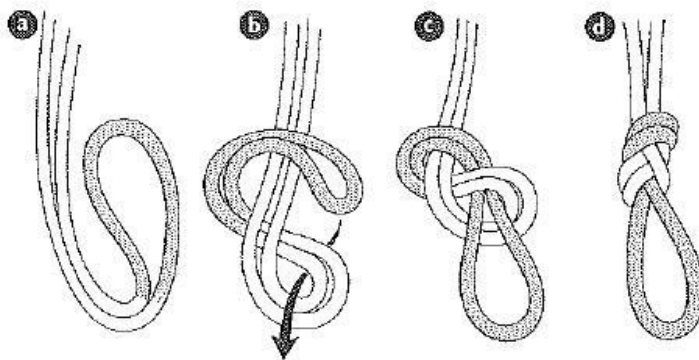
<u>Knot</u>	<u>Rope Strength</u>
Without knot	100%
Double fisherman's knot	65-70%
Bowline	60-70%
Water knot	60-70%
Figure 8	75-80%
Clove hitch	60-65%
Fisherman's	60-65%
Overhand	60-65%

### FIGURE 8 FOLLOW THRU

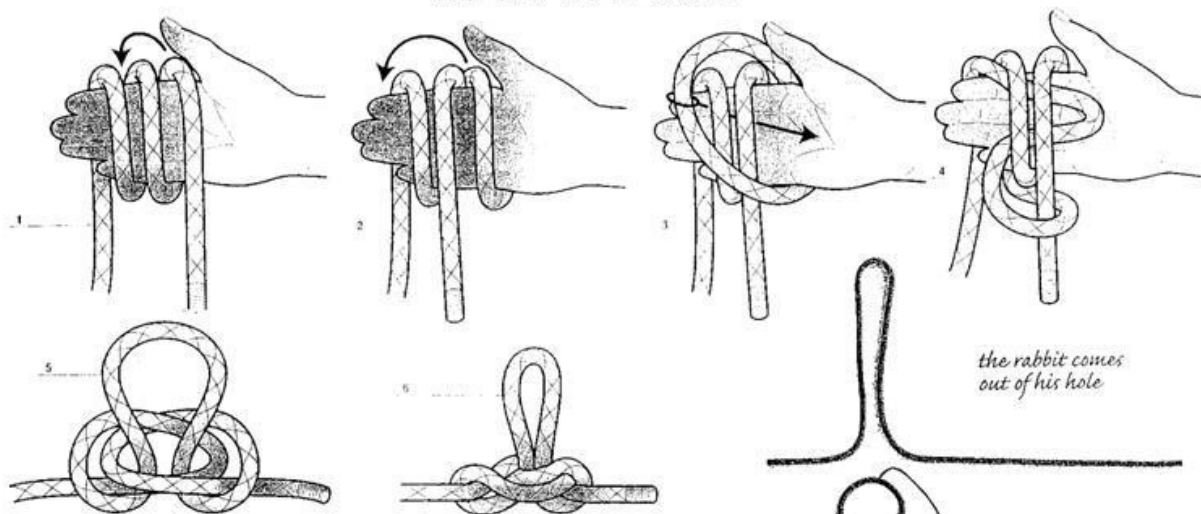


The figure-of-eight follow-through is typically used when tying into the end of a rope (a figure eight on a bight is used to tie into the center of a rope on snow climbs). It's strong, stays securely tied and is relatively easy to untie once loaded.

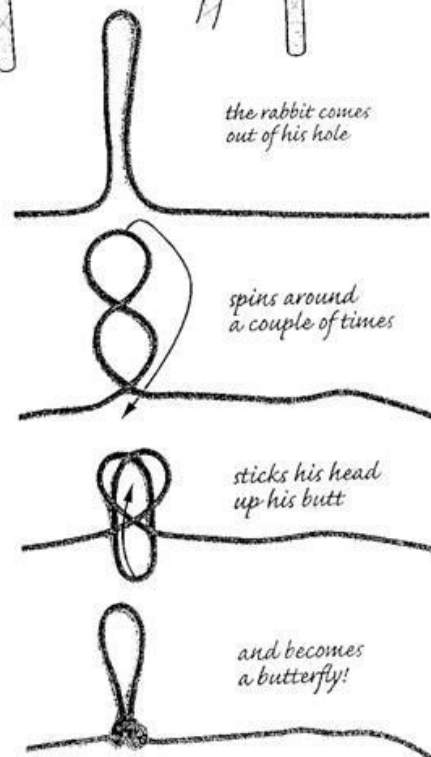


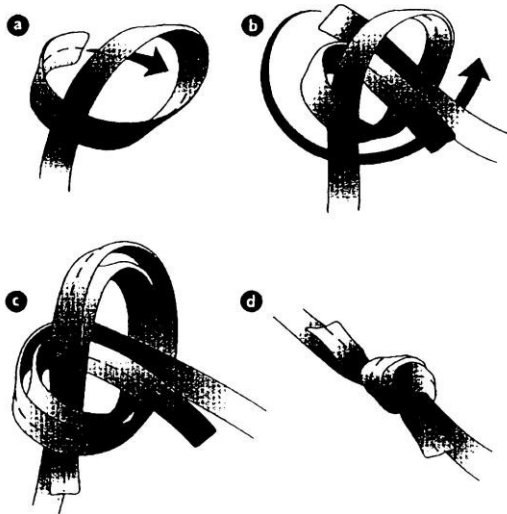
**FIGURE 8 ON A BIGHT**

The figure eight on a bight is used extensively in climbing and mountaineering. It is very similar to an overhand (like you would tie in the top of a garbage bag) but the extra twist in it makes it easier to untie and it is stronger.

**ALPINE BUTTERFLY****ALPINE BUTTERFLY****APPLICATIONS**

This fixed loop is tied in the bight of a rope and is clipped into by the middle climber in a team of three. It can be pulled in two (or even three) directions at once without distorting or capsizing. It can also permit the temporary use of a damaged rope, by isolating a flawed section within the loop.





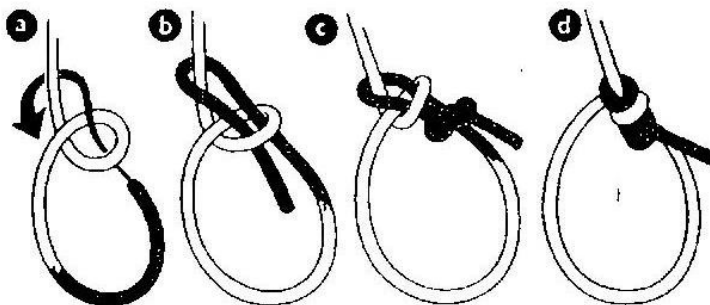
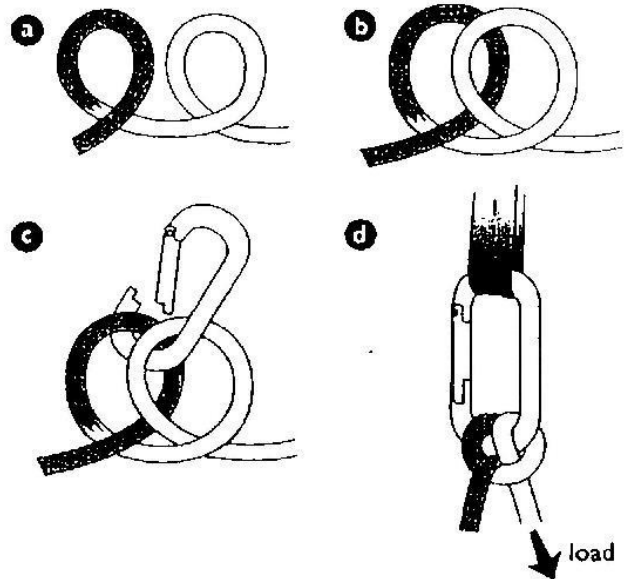
### WATER KNOT

The water knot is used to join pieces of webbing into slings or runners, oftentimes for an anchor. Dress neatly and leave 3 inch or longer tails to improve security.

### CLOVE HITCH

The Clove Hitch is a useful knot for attaching the middle of the rope to an anchor. It is quick and easy and will bear a significant load without sliding.

Coil the rope twice to make two identical loops with the rope ("bunny ears"). Pass the closer of your loops behind the other. Clip your two loops into a carabiner and pull tight to set your knot.

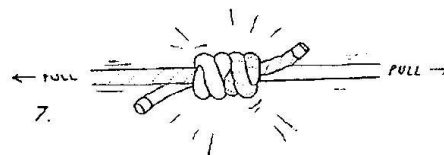
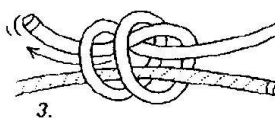
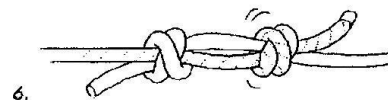
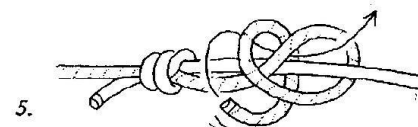
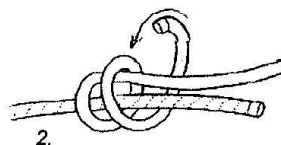
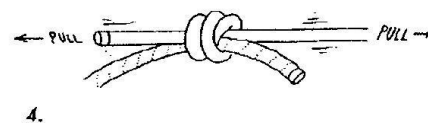
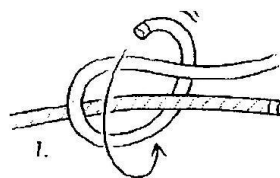


### SINGLE BOWLINE

The single bowline knot can be used in rock climbing to tie around natural anchor points. It is strong and easy to untie after being loaded.

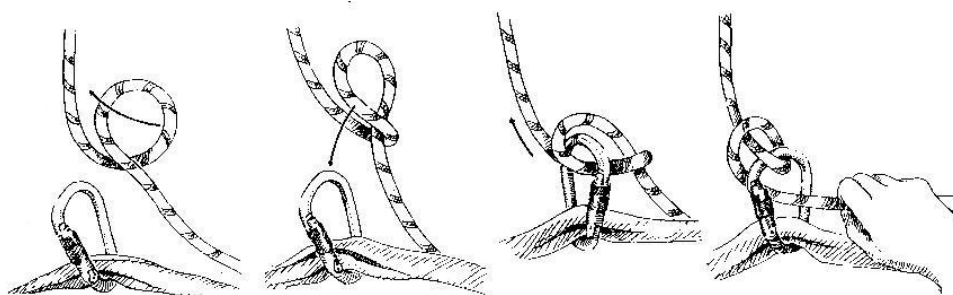
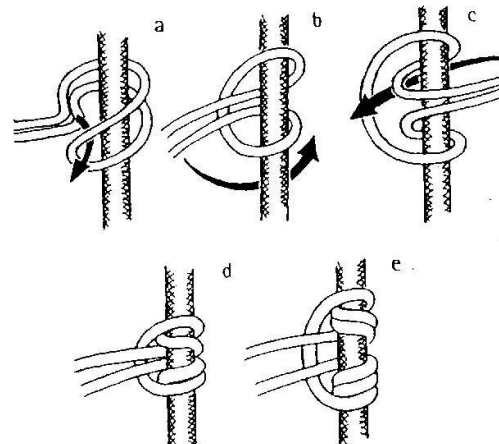
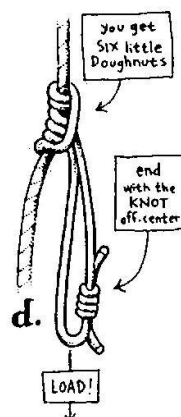
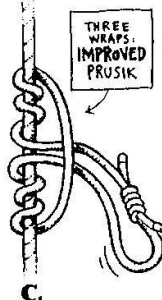
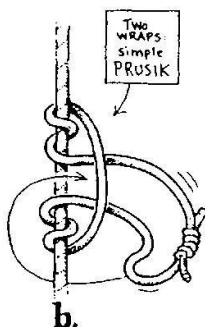
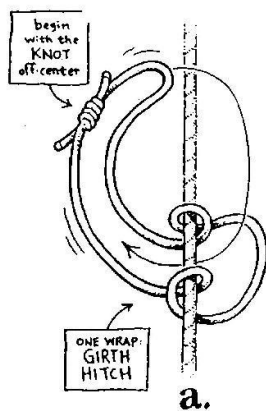
**DOUBLE FISHERMAN'S KNOT**

Used for tying the ends of a cord or rope together, especially for rappels. Very strong and secure.

**PRUSIK KNOT**

(see illustrations below)

Friction knot used to attach runners or cords to climbing rope. This knot grips the rope when under tension, but is free to move/slide when weight is released.



1. Twist rope
2. Twist again
3. Clip doubled rope in
4. Pull up and out

**MUNTER HITCH**

A multi-purpose friction knot used for belaying and rappelling. Requires larger pear-shaped carabiner to be most effective.



## CLIMBING SIGNALS

Climbing signals are specific verbal commands that allow a climber to communicate needs to the belayer. Be crisp and clear. It is often hard to hear due to windy conditions. Don't take anyone off belay unless you are sure they are safe.

**Use first names in crowded climbing areas. If an error or misunderstanding occurs, an accident could occur and have DISASTROUS results!!**

**On Belay?** – Climber to Belayer. Asked as a question ...I want to go. Are you ready?

**Belay On** – Belayer to Climber. All set. The belay is ready.

**Climbing** – Climber to Belayer. Here I come.

**Climb/Climb on** – Belayer to Climber. Come ahead.

**Up Rope/Take** - Climber to Belayer. There is slack in the rope – take up all the loose rope.

**That's Me** -Climber to Belayer. You are tugging on me - there is no slack in the rope.

**Slack** – Climber to Belayer. I can't move without some slack in the rope.

**Tension/Take** – Climber to Belayer. Hold the rope tight.

**Watch Me** – Climber to Belayer. I may fall. Be ready!

**Falling** – Climber to Belayer. Catch me. I'm falling!

**ROCK!ROCK!** – Watch out for the rock headed your way. Yell LOUDLY!!

**Off Belay** – Climber to Belayer. I am in a secure position and do not need a belay.

**Belay Off** – Belayer to Climber. Echoed to insure there is no misunderstanding.

## BELAYING

Belaying is a vital part of mountaineering. Belaying is when an ‘anchored’ or secure climber (‘belayer’) uses a belay technique to protect another climber while they are climbing. If the climber were to fall, the belayer would be able to quickly arrest their fall using the mechanical advantage of friction. Friction over the body or belay device, carabiners and rock make it possible for a belayer to withstand several hundred pounds of force created by a falling climber.

There are several types of belays, most of which use a device such as an ‘ATC’. We will demonstrate the fundamentals of belaying during the Saturday field session.

### **BELAYING FUNDAMENTALS**

The **A B Cs** of belaying are:

**A: Anchor**

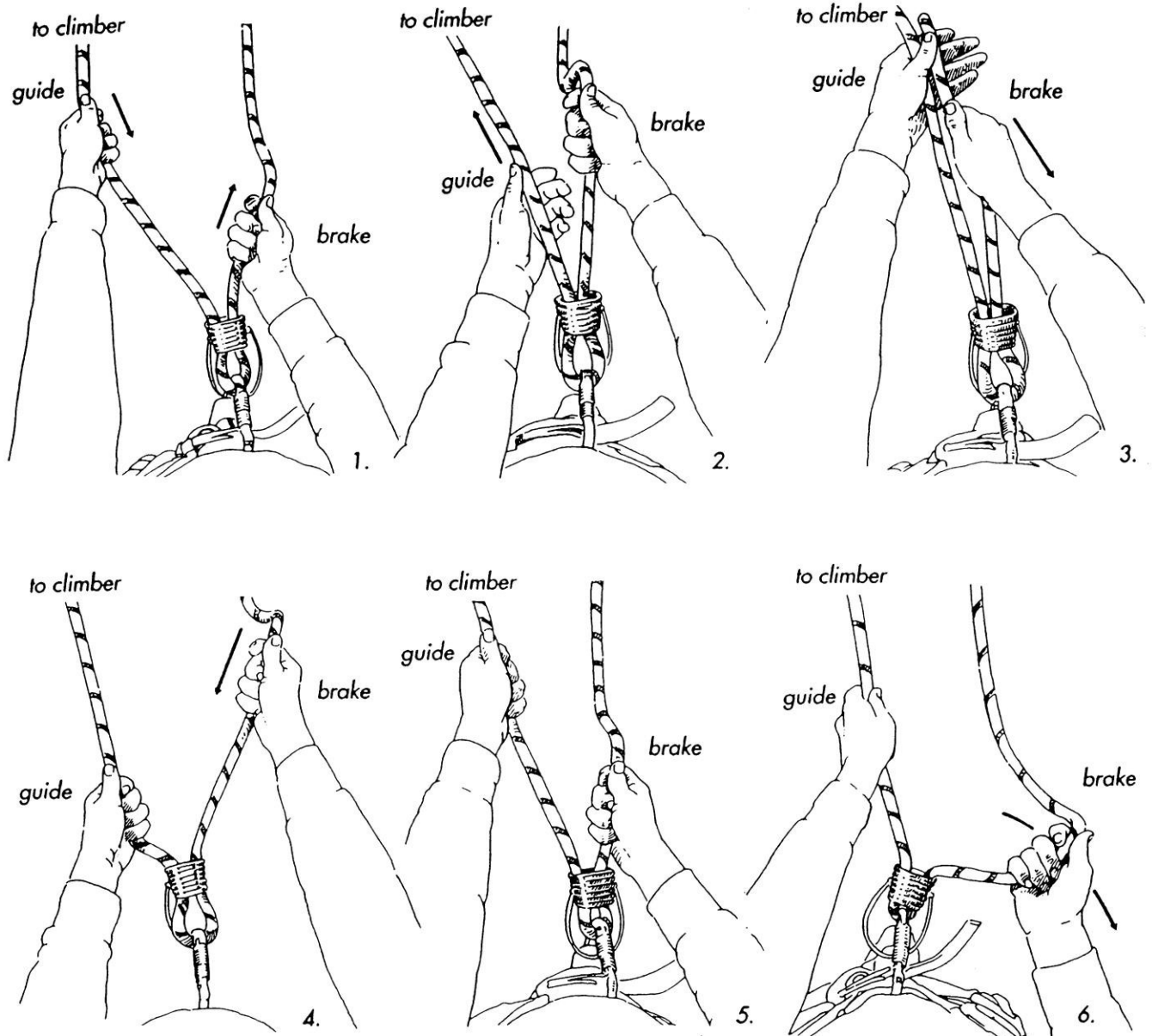
**B: Belay / Belayer**

**C: Climber**

1. Anchor “bombproof” rock, piton, bolt, tree, etc.
2. Anchor the belayer and foot brace in line with direction of fall
3. Strong position ... solid foot brace with locked knees
4. Comfortable position ...you will be here a while
5. Safe position ... safe from falling rocks, climbers, etc.
6. **Brake hand never leaves the rope!!!!**
7. Rope management ... avoid slack, tangling, sharp rocks, etc.
8. Use the basic voice commands

The belay position must be comfortable because some climbs involve considerable lengths of time at which the belayer must be ready to react to an emergency. The belayer who is not comfortable will tend to move around attempting to find some relief from the pain of sharp rocks, etc. While moving, even in the slightest amount, he is not ready to operate the belay. Not only must the belayer be comfortable waiting for a fall and stopping that fall, but also, he may be called upon to hold a fallen climber for some time or lower him to a place of safety.

The foot brace solidifies the position and makes it possible to keep the belayer from being pulled out of position. The foot brace and the anchor must be coordinated with the direction of fall. The components of a belay, including the belayer, must be kept in as close a line as possible. If any of these components are allowed to be out of line, the force of a fall will tend to pull that component out of its position and into the common line.



### BELAYING

#### Taking rope in:

1. Both hands grasping tightly, the rope is fed through the device.
2. The guide hand slides up,
3. clasps both ends of the rope above the other hand to allow the brake hand to slide down, and the series begins again.

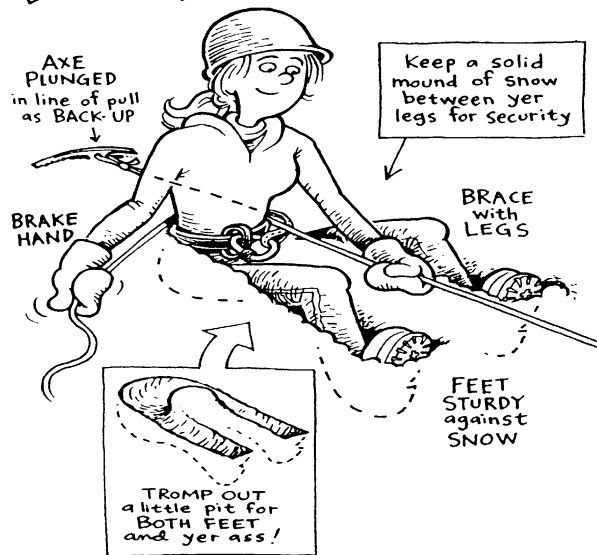
### BELAYING

#### Letting rope out:

- 4, 5. Both hands grasping tightly, the rope is fed through the device.
6. The braking action: the brake hand bends the rope across the belay device.

## BELAY TECHNIQUES FOR SNOW CLIMBS

### SEATED SNOW BELAY



### Seated Snow Belay

The most basic type of anchor system is a single piece of protection like a picket or ice axe, combined with good position, such as a solid snow-seat belay. A simple anchor such as this, in firm snow, is usually adequate to belay your partner across a tricky spot. It would not be adequate when a long, hard fall is a real possibility.

### Standing Carabiner-Ice Axe Belay

The standing carabiner-ice axe belay is a quick and effective belay technique. Using this technique, the force of a fall pulls the belayer more firmly into the stance.

1. Plant the axe as deeply as possible, the pick perpendicular to the fall line.
2. Attach a very short sling/runner with a girth hitch to the axe shaft at snowline and clip on a carabiner.
3. Stand at a right angle to the fall line, facing the same side as the climber's route.
4. Brace the axe with your uphill boot, standing atop the sling but leaving the carabiner exposed. (Keep crampons off the sling.)
5. The rope runs from the potential direction of pull up through the carabiner and then around the back of your waist and into your uphill (braking) hand. The rope should also pass thru a carabiner on your harness to prevent it from being pulled down to your feet in the event of a fall. Alternatively, the rope can run through a belay device instead of around the back.



Fig. 16-36.  
Carabiner-ice ax belay:  
plant ax, stand on runner,  
and run rope up through  
carabiner. Inset shows  
runner and carabiner  
attachment to ice ax.

## RAPPELLING

**A rappel system has four basic elements:**

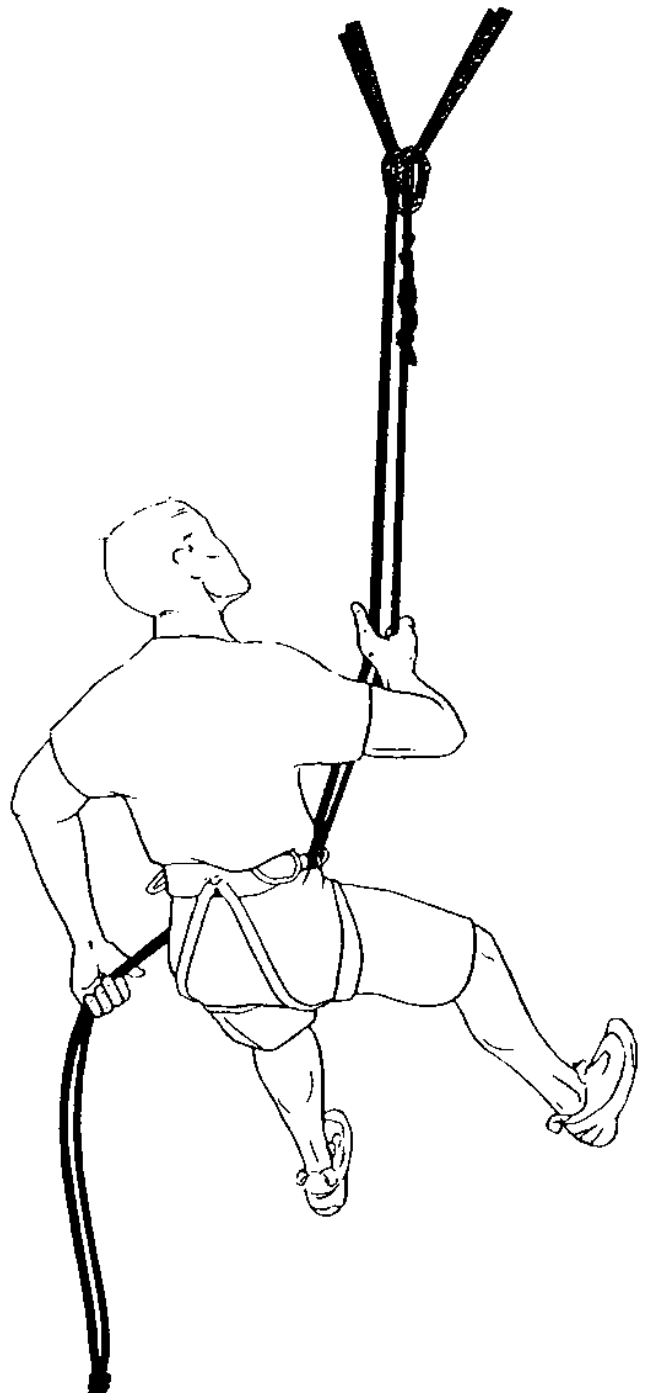
1. An anchor
2. A rope
3. A means of applying friction to the rope
4. Someone to rappel

Each element is equally important. Without all four working together, each securely attached to the next, the system could fail, possibly with disastrous results.

The most variable element in the rappel system is the climber. Personal attitude, fatigue, anxiety, and varying levels of skill and training all come together to affect the outcome.

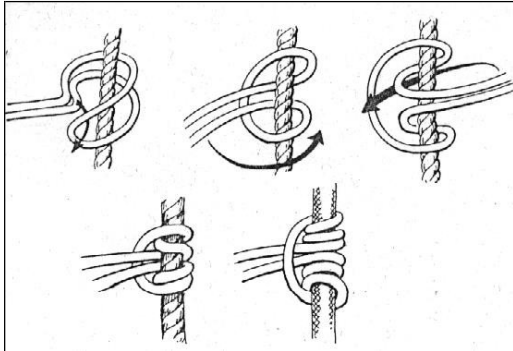
If you learn to treat the four elements of rappelling as an integrated system - a system of which you are a critical part - rappelling becomes easier to understand and therefore, safer.

Most climbers use a mechanical device for rappelling. These devices all place friction on the rope. The rope runs through the rappel device attached to your harness. As you begin the rappel and gravity pulls you downward, the rope slides through the device. Your brake hand controls your descent by adjusting the amount of friction on the rope. You control the speed of the descent, and you can come to a stop at any time you wish.

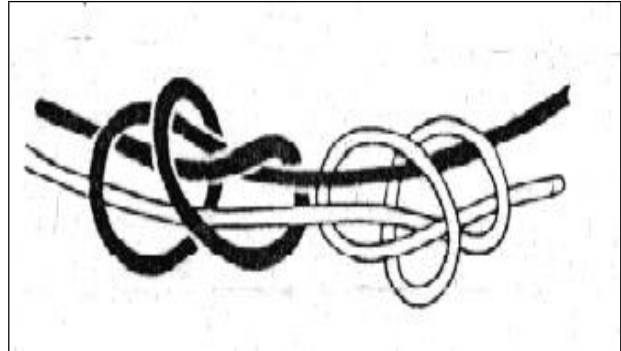


## PRUSIKING

**Prusik** -- A knot that can slide freely when un-weighted but won't slip when weighted. The Prusik knot was invented in 1931 by Dr. Karl Prusik and was described in an Austrian mountaineering manual describing it as an ascending knot.



*Prusik Knot*



*Double Fisherman's Knot*

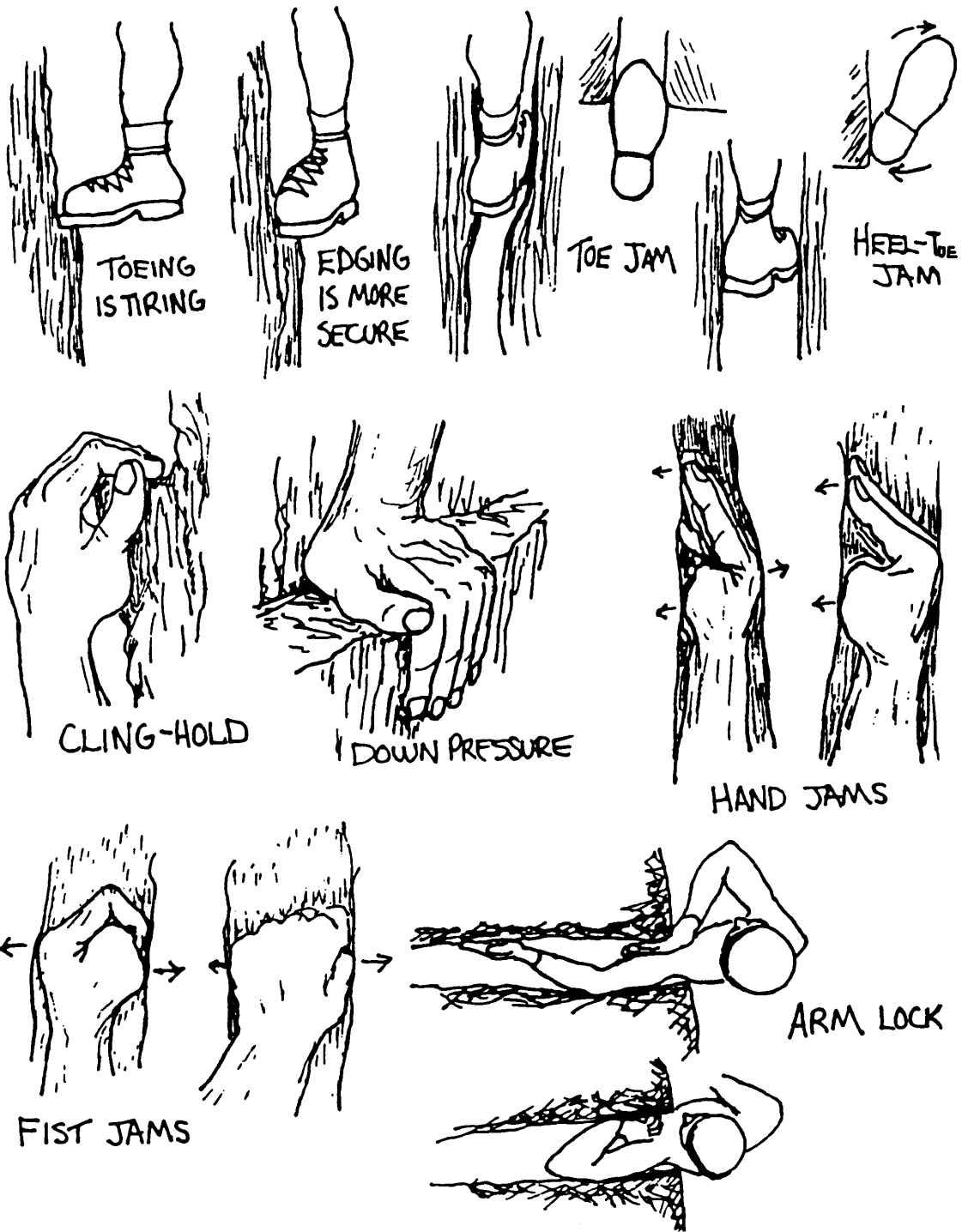
### Making Prusik Slings

1. Use the most pliable Perlon cord you can find. Have the climb shop cut the cord. The waist prusik should roughly equal your height. Use the following formula for judging the length of the foot prusik: 11 feet plus 2 inches for every inch you are taller than 5'0". A person who is 5'6" would need a 12' length of cord.
2. Use a double fisherman's knot to tie the waist prusik into a loop.
3. A foot loop is tied in each end of the foot prusik. Tie an overhand stopper knot about 18 inches from each end. Tie half of a double fisherman's knot with each end of the rope; this allows the foot loops to cinch down around a boot and the stopper knots keep the loops from cinching too tight.
4. Tie an optional figure eight on a bight in the middle of each prusik making a nine-inch loop for tying each prusik to the climbing rope.
5. When finished, the waist prusik should extend from belly button to eyebrows and the foot prusik should reach the belly button.

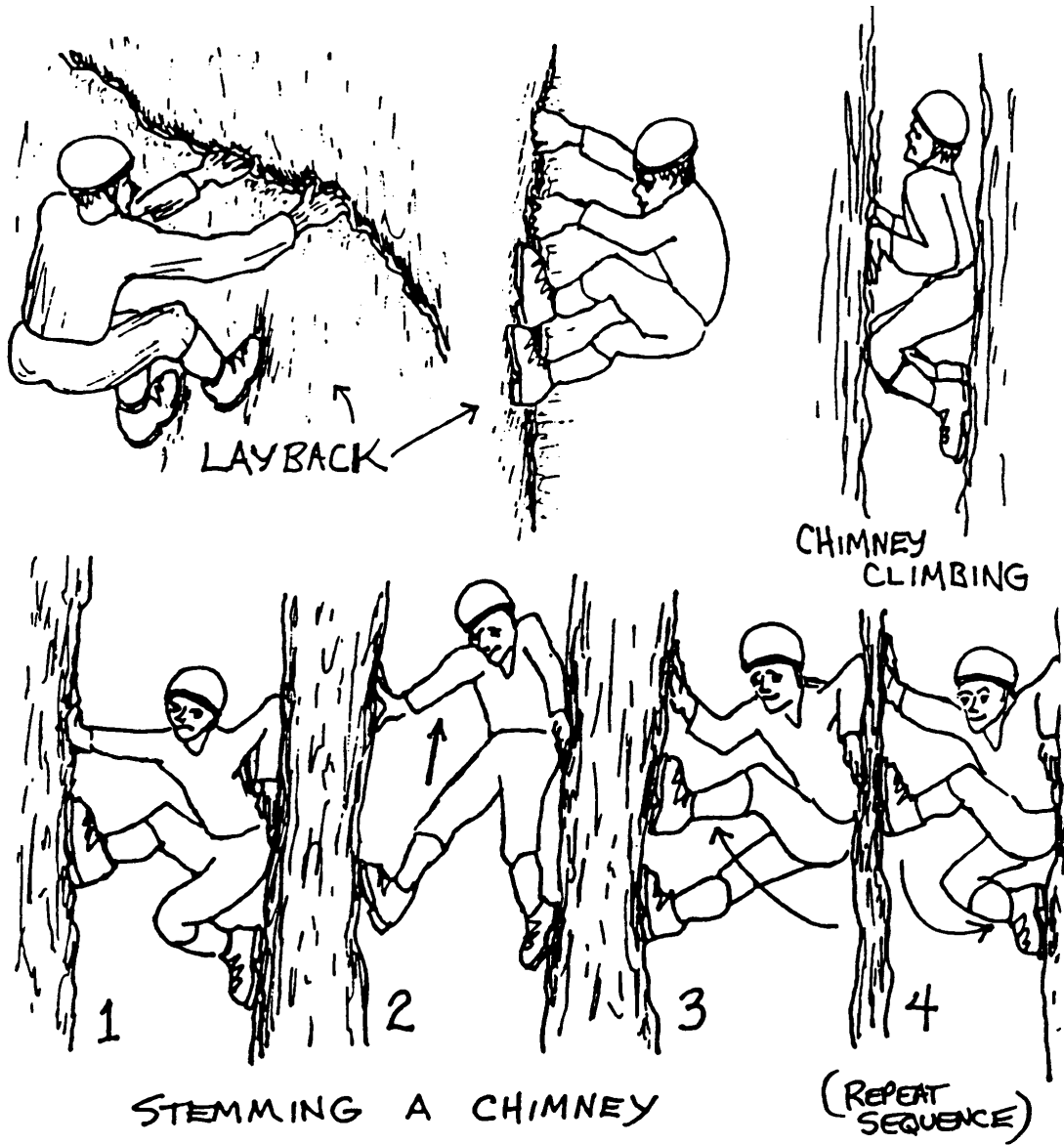
### Ascending Technique

1. The waist prusik is attached to rope above the foot prusik.
2. Stand up in the foot loops of the foot prusik.
3. Hold the rope for balance with one hand while you loosen the friction knot of the waist prusik and slide it up the rope.
4. Sit down in the seat harness and weight the waist prusik.
5. Loosen the friction knot of the foot prusik and move it up 18-24 inches.
6. Repeat steps 2-5.
7. The most difficult part of prusiking is getting over the edge at the top of the rock/ ice.

## FREE CLIMBING TECHNIQUES



## ... More Free Climbing Techniques

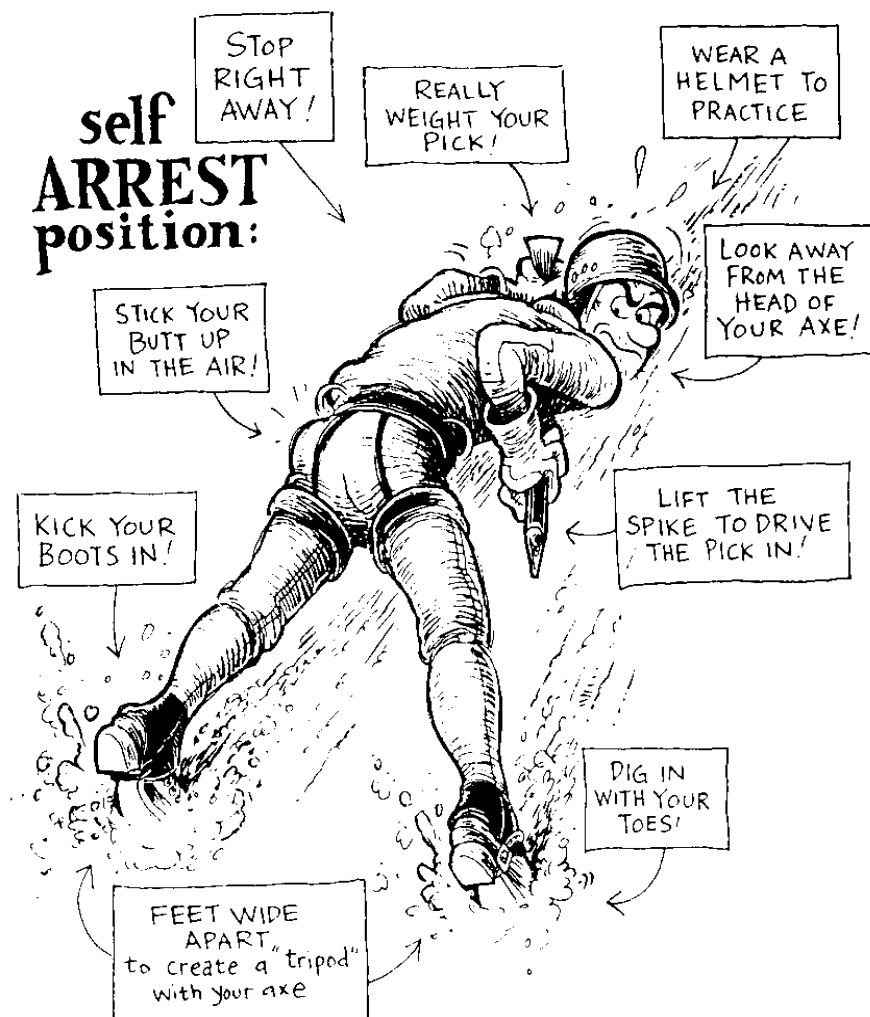




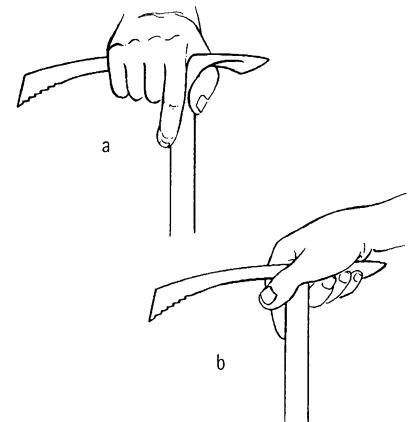
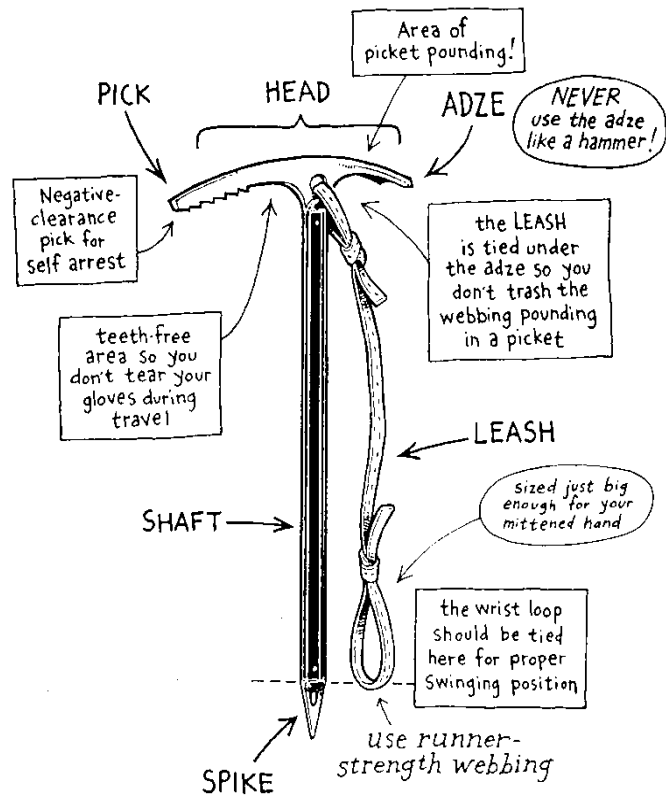
## SELF ARREST

### Ice Axe Self-Arrest Position

1. One hand on the head of the axe with the thumb under the adze and fingers over the pick. The other hand on the shaft near the spike. Use a firm grip.
2. Drive the pick into the slope near your shoulder with the shaft pulled firmly against the chest diagonally.
3. Keep the chest pressing on the shaft with your back arched and legs held stiff driving your toes into the slope.
4. Keep your knees up and away from the slope with your feet well spread.
5. Hang on to the axe! This position must be attained as rapidly as possible from any fallen position. A quick self-arrest position is far better than a slow stylish one.



- **Your hands** hold the axe in a solid grip, one hand in the self-arrest grasp with your thumb under the adze and fingers over the pick, and your other hand on the shaft just above the spike.
- **The pick** presses into the snow just above your shoulder so that the adze is near the angle formed by your neck and shoulder. This is crucial. You cannot exert sufficient force on the pick if the adze is not in the proper position.
- **The shaft** crosses your chest diagonally and you hold the spike end close to the hip that is opposite the axe head. Grip the shaft near the spike end to prevent that hand from acting as a pivot point around which the spike can swing to jab your thigh. (A short axe is held the same way, although the spike will not reach the opposite hip.)
- **Your chest and shoulder** press down on the ice axe shaft. Successful self-arrest relies on your body weight falling and pressing on the axe, rather than just arm strength driving the axe into the snow.
- **Your head** is head is close to the ground and you are looking away from the head of the axe. This position prevents your shoulders and chest from lifting and keeps your weight over the adze.
- **Your spine** arches slightly away from the snow. This places the bulk of your weight on the axe head and on your toes or knees, which are the points that dig into the snow to force a stop. Pull up on the spike end of the shaft, which starts the arch and rolls your weight toward your shoulder by the axe head.
- **Your knees** are slightly bent and against the surface to slow the fall in soft snow. On harder surfaces, where your knees have little stopping power, they help stabilize your body position.
- **Your legs** are stiff and spread apart, toes digging in. If you are wearing crampons, dig in with your knees and keep your toes off the snow. Crampon points can catch on hard snow or ice and flip you over backward, out of control.



Grasping an ice axe:  
a. self-arrest grip b. self-belay grip

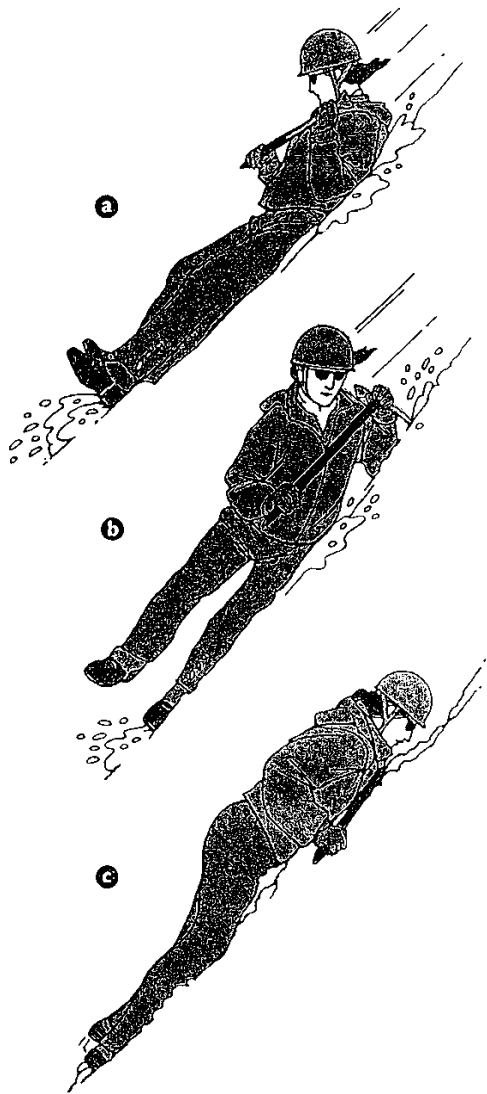


Fig. 16-16.

Correct self-arrest technique when you fall on your back with your head uphill: a, falling; b, rolling toward the pick onto your stomach; c, the completed self-arrest.

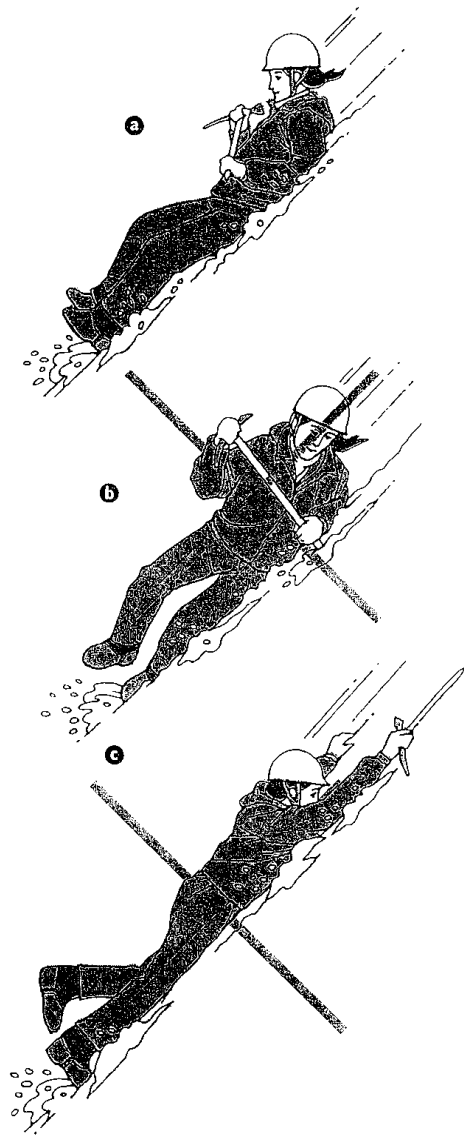


Fig. 16-17.

Incorrect self-arrest technique when you fall on your back with your head uphill, a, falling; b, rolling toward spike; c, ax is wrenched out of your hands.

## Self Arrest Technique in Different Positions

Your self-arrest technique depends on the position you are in after a fall. You will be sliding in one of four positions: head uphill or head downhill and, in either case, face down or on your back.

If you are falling, your immediate goal is to get your body into the only effective self-arrest position: head uphill, feet downhill, and face pressed into the snow. The first move toward that goal is to grasp the axe with both hands, one hand on the axe head in the self-arrest grasp and the other hand at the base of the shaft. The next moves depend on your position while falling.

**Head uphill, face down:** You are already in self-arrest position. All you have to do is get the pick pressed into the snow and your body over the axe shaft, Lifting the spike to drive in the pick.

**Head uphill, on your back:** This position (fig. 16-16a and fig. 16-17a) is not much more difficult to self-arrest than the face-down position. Roll toward the head of the axe and aggressively plant the pick into the snow at your side while rolling over onto your stomach (fig. 16-16b). Roll in the direction of the axe head (fig. 16-16c). Beware of rolling toward the spike, which can jam the spike in the snow before the pick (fig. 16-17b) and wrench the axe from your hands (fig. 16-17c).

**Head downhill, face down:** Self-arrest from a headfirst fall is more difficult because your feet have to first be swung downhill. In this face-down predicament, reach downhill and off to the axe-head side and get the pick into the snow to serve as a pivot to swing your body around. Work to help swing your legs around so they are pointing downhill. Never jab the spike into the snow and pivot on that end of the axe. That will bring the pick and adze of the axe across your slide path and on a collision course with your chest and face.

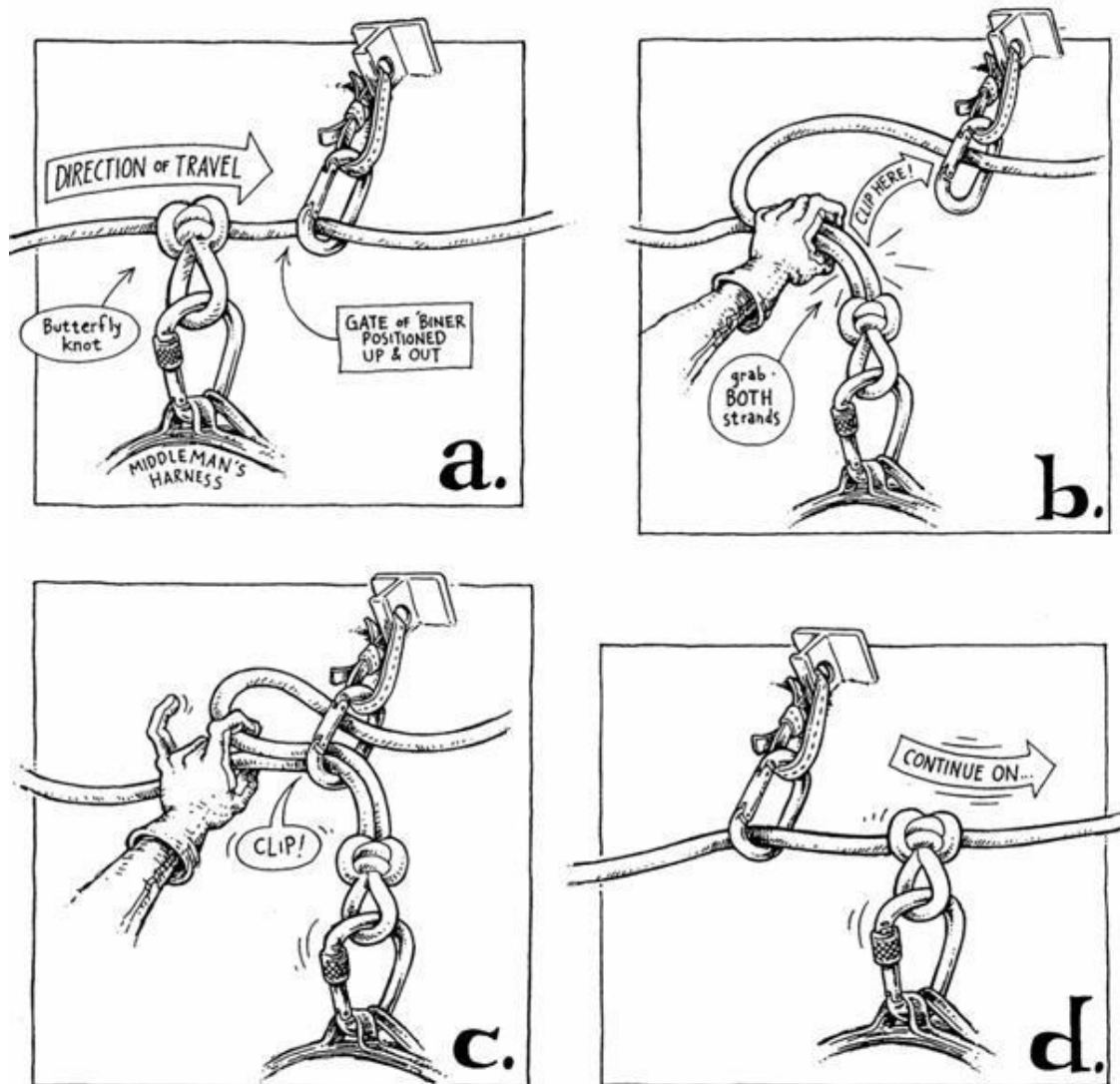
**Head downhill, on your back:** Hold the axe across your torso and aggressively jab the pick into the snow; then twist and roll toward it. Once again, the pick placed to the side serves as a pivot point. Planting the pick will not bring you around to the final self-arrest position. You need to work at rolling your chest toward the axe head while you work your legs to swing around and point downhill. A sitting-up motion helps the roll.

Practice the self-arrest in all positions on increasingly steeper slopes and hard snow above a safe runout. Practice with a full pack. The key to success is to get quickly into the arrest position and dig in. During practice, leave the ice axe leash off your wrist so there is less chance of the axe striking you if you lose control of it. Cover or pad the adze and spike to minimize chances of injury. **The effectiveness of the self-arrest depends on your reaction time, the steepness and length of the slope, and snow conditions.**

## ROPE TRAVEL – CLIPPING THROUGH

This technique keeps the rope clipped when the middle person passes the protection. On a team of two, the second person will remove the point of running protection (clean), but on teams of three or more the middle people will need to clip through the running protection, leaving it in place for the last person to clean.

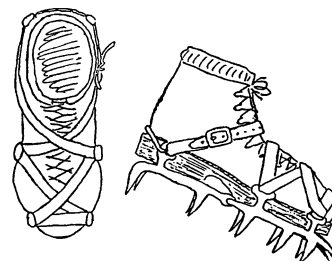
To clip through a point of protection, without unclipping the rope and endangering the team, follow the illustrated steps below. If the point of protection has two carabiners on it, you can clip through simply by clipping the rope on the backside of your knot through one carabiner, then unclipping the rope on the front side of your knot.



## USING CRAMPONS

Crampons are used on steep ice or snow slopes to minimize the need for kicking or chopping steps. Crampons should be selected to fit snug on the boots and be held securely by a dependable strap system. There is a “left” and a “right” crampon.

Climbing with crampons requires practice. The crampon spikes are dangerous, and care must be exercised not to tear clothing and flesh or cut rope. Each step should be driven firmly into the slope. One should try to drive all spikes into the slope rather than just those on the uphill side. This may require some ankle bending. Never “glissade” with crampons.



## ROPE CARE – DURING AND AFTER A CLIMB

Modern climbing ropes are known as kernmantle ropes and have a woven nylon sheath over a braided core. For the safety of your climbing team, it is important that a rope stays in prime condition. Here are some key things to remember when caring for a rope:

1. Never step on your rope. Rock particles and other debris from your shoes could work through the sheath and begin to tear the cords.
2. Never buy a used rope. You don't know what the previous owner may have done with it or why he is selling it.
3. Do not expose a rope to unnecessary amounts of sunlight. UV rays are the single most damaging threat to the security of your rope. The more time it spends in direct sunlight, the faster it will deteriorate. Store your rope in a cool, dry, shady place.
4. Do not expose your rope to foreign substances. Although hydrocarbon solvents such as alcohol and gasoline do not affect nylon chemically, they could make it more flammable, especially at times when the rope is exposed to large amounts of friction. Battery acids and other corrosives must be kept away from your rope at all costs.
5. After even moderate use your rope will get dirty. To clean it, machine wash in cold or warm water with mild soap. Make sure to use the delicate cycle and rinse twice to make sure no soap stays in the threads. Do not put it in the dryer. Instead, hang it in a shady place or lay it out to let the water evaporate naturally. It normally takes two days to dry out completely.
6. Inspect your rope frequently. To check for frays and other damage, fold the rope between your fingers and work it from one end to the other keeping watch for any sign of irregularity.
7. A rope should be retired after four years, even if used only rarely. For weekend use, retire your rope after two years. For multi-fall use, change ropes after three months of constant use or a year of part-time use. After a long, severe fall, the rope should be retired immediately.
8. Do not subject the ropes to undue strain or wear. Bouncing on a rappel line, which is over a sharp edge, damages the rope.
9. Do not allow kinks, twists or unnecessary knots to remain in the rope.

## ADDITIONAL RESOURCES

### Books/Periodicals

- Mountaineering: The Freedom of the Hills - By The Mountaineers
- 100 Hikes in Northwest Oregon (2nd Edition) - By William Sullivan
- 100 Hikes Oregon Coast & Coast Range (2nd Edition) - By William Sullivan
- Oregon High - By Jeff Thomas
- Backpacker Magazine
- Climbing Magazine
- Rock and Ice Magazine

### Internet Resources

- Chemeketans- [www.chemeketans.org](http://www.chemeketans.org)
- Cascade Adventures- [www.cascadeadventures.net](http://www.cascadeadventures.net)
- The Mazamas Climbing Club - [www.mazamas.org](http://www.mazamas.org)
- REI Learn/Share - <http://www.rei.com/learn.html>
- The Mountaineers Outdoor Essentials - [www.mountaineers.org](http://www.mountaineers.org)
- Oregon Hiking - [www.oregonhiking.com](http://www.oregonhiking.com)
- Cool Trails [www.cooltrails.com](http://www.cooltrails.com)
- Trails NW - [www.trailsnw.com](http://www.trailsnw.com)
- Mount Hood National Forest - [www.fs.fed.us/r6/mthood](http://www.fs.fed.us/r6/mthood)
- Summit Post - [www.summitpost.org](http://www.summitpost.org)
- Oregon State Parks - [www.oregonstateparks.org](http://www.oregonstateparks.org)
- Washington State Parks [www.parks.wa.gov](http://www.parks.wa.gov)
- NWAC Avalanche Forecasts - [www.nwac.us/](http://www.nwac.us/)
- Portland Mountain Rescue [www.pmru.org](http://www.pmru.org)
- Timberline Mountain Guides - [www.timberlinemtguides.com/](http://www.timberlinemtguides.com/)
- Virtual Cascades (Mt. Hood) - <http://reocities.com/>
- North West Hiker- [www.nwhiker.com](http://www.nwhiker.com)
- Cascade Climbers- [www.cascadeclimbers.com](http://www.cascadeclimbers.com)

## AREA CLIMBING EQUIPMENT SHOPS (AS OF MAR 2021)

The Chemeketans are a non-profit organization and we do not specifically endorse or support any of the following companies. This listing is provided as a resource only.

### Salem Summit Company

240 Commercial St NE  
(Salem) (503) 990-7304  
<http://salemsummitco.com/>  
Hours: Mon – Fri: 10 - 6  
Sat.: 10-5 Sun: 12-4

### Mountain Shop

2975 NE Sandy Blvd  
(Portland) (503) 288-6768  
[www.mountainshop.net](http://www.mountainshop.net)  
Hours: Mon – Thur: 10 - 7  
Sat: 10-6 / Sun: 12-5

### Next Adventure

426 SE Grand Ave (Portland)  
(503) 233-0706  
[www.nextadventure.net](http://www.nextadventure.net)  
Hours: Mon – Fri: 10 - 7  
Sat: 10-6 / Sun: 11-5

### Oregon Mountain Community

2975 NE Sandy Blvd (Portland)  
1-800-538-3604  
[www.e-omc.com](http://www.e-omc.com)  
Hours: Mon – Fri: 10 - 7  
Sat: 10 - 6 / Sun 12 - 5

### Peak Sports

207 NW 2nd St (Corvallis)  
(800) 427-6442  
[www.peakssportscorvallis.com](http://www.peakssportscorvallis.com)  
Hours: Mon – Thu: 9 - 6 / Fri: 9 - 8  
Sat: 9 - 6 / Sun: 12 - 5

### Redpoint Climber's Supply

8222 US Hwy 97  
(Terrebonne) (541) 923-6207  
[www.redpointclimbing.com](http://www.redpointclimbing.com)  
Hours: Mon, Thur - Sun: 9 - 5  
Closed Tues & Wed

### U.S. Outdoor Store

600 NW 14<sup>th</sup> Ave #100  
(Portland) (503) 223-5937 / 1-866-876-3932  
[www.usoutdoor.com](http://www.usoutdoor.com)  
Hours: Mon – Fri: 9 - 8  
Sat: 10 - 6 / Sun: 11 - 5

### REI [www.rei.com](http://www.rei.com)

#### REI - Portland

1405 NW Johnson St  
(503) 221-1938  
Hours: Mon - Sat: 10 - 9 / Sun: 10 - 7

#### REI - Tualatin

7410 SW Bridgeport Rd  
(503) 624-8600  
Hours: Mon - Sat: 10 - 9 / Sun: 10 - 6

#### REI - Hillsboro

2235 NW Allie Ave  
(503) 617-6072  
Hours: Mon - Sat: 10 - 9 / Sun: 11 - 6

#### REI - Clackamas

12160 SE 82nd Ave  
(503) 659-1156  
Hours: Mon - Sat: 10 - 9 / Sun: 11 - 6

#### REI - Bend

380 Powerhouse Dr  
(541) 385-0594  
Hours: Mon – Fri: 10 - 9  
Sat: 10 - 9 / Sun: 11 - 6

#### REI - Eugene

306 Lawrence St  
(541) 465-1800  
Hours: Mon - Fri: 10 - 9  
Sat: 10 - 6 / Sun: 11 - 6



## GLOSSARY OF CLIMBING TERMS

Adze: A thin blade mounted perpendicular to the handle on an ice axe that can be used for chopping footholds.

Alpine Start: Starting early in the morning, usually well before sunrise.

Anchor: An arrangement of one or (usually) more pieces of gear set up to support the weight of a belay or top rope

Approach: The path or route to the start of a technical climb.

Belay: To protect a climber from falling using a rope, friction, and an anchor.

Belay device: A mechanical device used to create friction when belaying by putting bends in the rope (e.g. ATC, Grigri, Reverso, Sticht plate, eight and tuber)

Beta: Advice and/or instructions on how to complete a climbing route.

Bollard: A large knob of rock or ice used as a belay anchor.

Bolt: A point of protection permanently installed in a hole drilled into the rock, to which a metal hanger is attached, having a hole for a carabiner or rappel ring.

Carabiner: Metal rings with spring-loaded gates, used as connectors.

Clean: Removing snow protection (e.g., pickets) or rock protection (e.g. nuts or cams) when they are no longer needed. Cleaning is done by the last person on a rope team.

Clipping in: The process of attaching to belay lines or anchors for protection.

Clipping thru anchors/protection: The safe and efficient movement of a climber, attached to a rope, thru or past individual anchors (protection) while always keeping themselves attached to the rope and the rope attached to the anchor system

Crux: The most difficult portion of a climb.

Deadman anchor: An object buried into snow to serve as an anchor for an attached rope.

Fixed rope: A rope which has a fixed attachment point

Friction: Climbing technique relying on the friction between the sloped rock and the sole of the shoe to support the climber's weight, as opposed using holds or edges, cracks, etc.

Glissade: Descending a steep snow slope by sliding on your butt using your ice axe to control your speed.

Grade: 1) A measure of the technical difficulty of a particular climb or bouldering problem 2) A term referring to the slope angle of an incline.

Lead Climbing: A form of climbing in which the climber places anchors and attaches the belay rope as they climb.

Munter Hitch: A simple hitch that is often used for belaying without a mechanical belay device. Otherwise known as an *Italian hitch* or a *Friction hitch*.

Pitch: 1) One rope length (50-60 meters) 2) Portion of a climb between two belay points

Plunge Step: Descending a snow slope with an aggressive heel-first technique.

Protection: (Pro) Equipment or anchors for safety or to arrest a fall.

Prusik : A friction knot used for ascending a rope.

Rappel: Descending a fixed rope using a friction device.

Rest step: Energy-saving technique where un-weighted (uphill) leg is rested between each forward step, by locking the knee of the rear leg.

Runner: Loop of tubular webbing or cord commonly used for anchor building and while climbing. Can be a sewn loop or a tied with a water knot. Also called a sling.

Scree: Small, loose, broken rocks, often at the base of a cliff.

Self-Arrest: The act of planting the pick of your ice axe into the snow to arrest a fall in the event of a slip. Also, a method of stopping in a controlled glissade.

Sharp end: The end of the belay rope that is attached to the lead climber.

Smearing: Climbing technique using only the friction of the climbing shoe on the rock

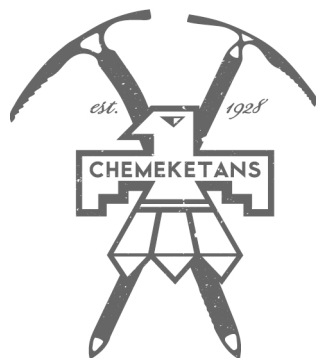
Sport Climbing: A style of climbing using pre-placed bolts for protection.

Top Rope: Climbing while belayed through an anchor above the climber

Traditional climbing: A style of climbing where climbers place their own protection as they climb.

Webbing: Tubular nylon, mainly used to make runners and slings.

Z-pulley: A system of rope, anchors, and pulleys which employs a mechanical advantage to rescue a climber



For more information please visit: [chemeketans.org](http://chemeketans.org)