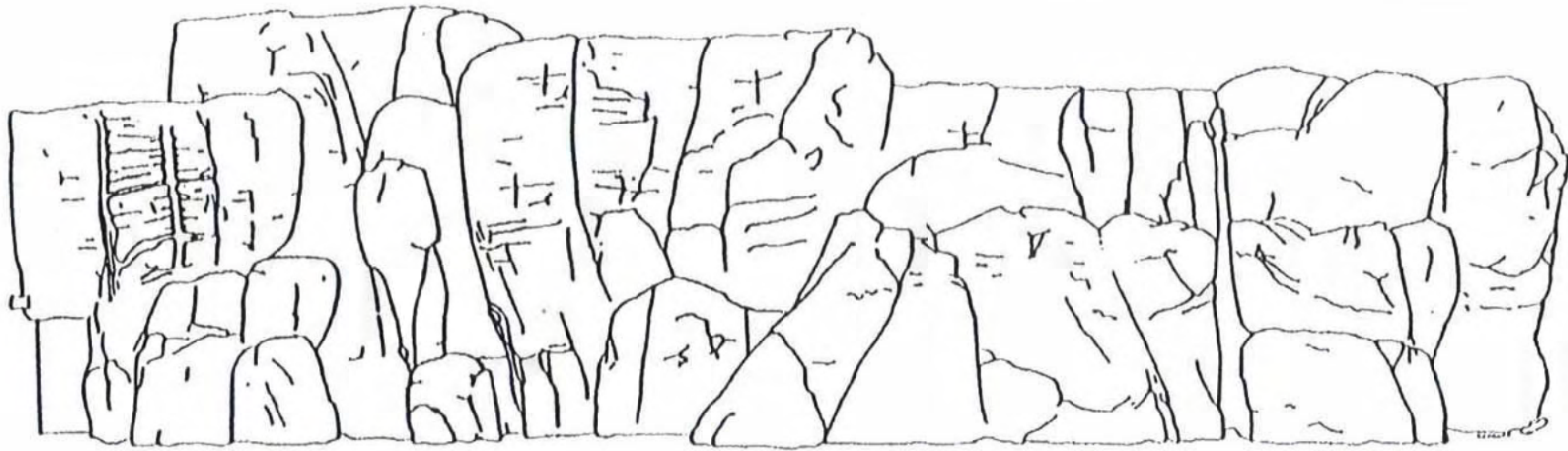
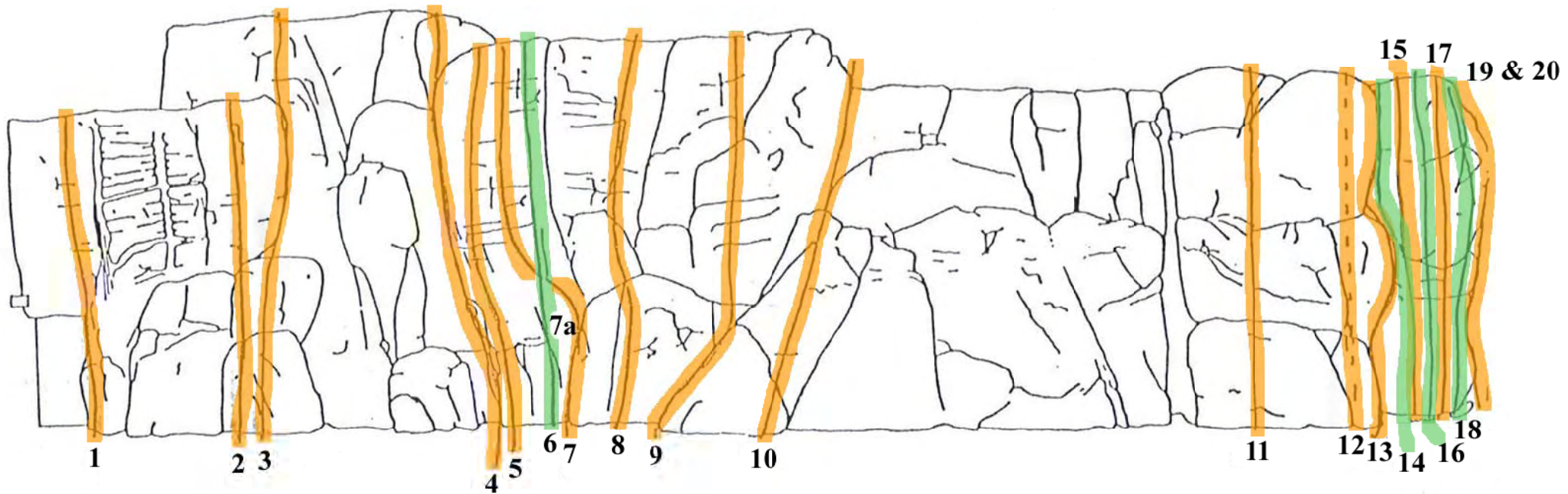


**PE 258 Basic Rock Climbing
Course Pack**



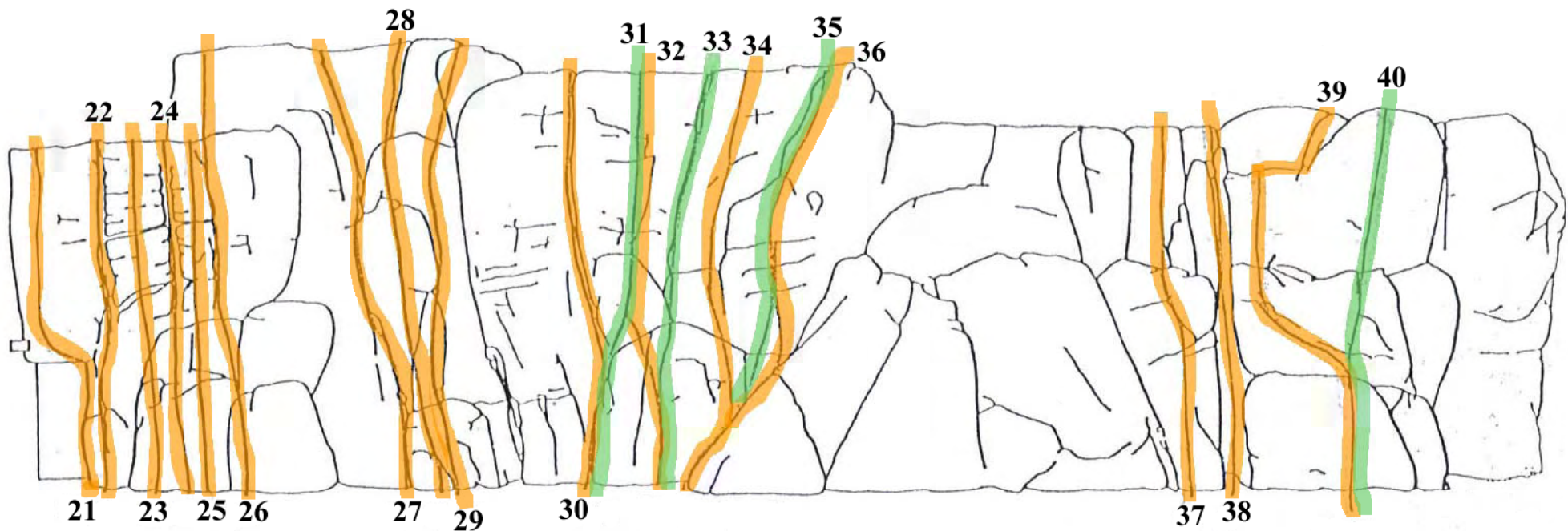
1. Mark climbing route with highlighter.
2. Date the climb.
3. Indicate if climb was completed (C) or attempted (A).
4. Number the climb.

FauxRock Climbing Routes (1)



1. No Exit, 5.10a, between modulars and offwidth.
2. ?, 5.11b, between large crack and corner.
3. Layback, 5.9, up the boulders to layback crack.
4. Overhanging Arete, 5.11c, climb arete to top.
5. Migrane, 5.11b, thin face, stay off corners.
6. Green Gully, 5.10b, climb face just to the left of crack right of 'crosshairs'.
7. The Gutter, 5.10a, between migrane and Layback.
- 7a. Gutter Direct, 5.10b, start of Green Gully to finish.
8. Swing, 5.9, just left of the Fist Jam crack.
9. Wolfpack Special, 5.10b, stay off slab.
10. Areteneck, 5.12, smooth arete, stay off easy wall to right.
11. SmallPox, 5.9, up small pits to flat hold on left.
12. InnerFace, 5.10b, inside chimney face, no stemming, no slapping corners.
13. TotumPole, 5.9, straddle arete.
14. FingerLove II, 5.11b, climb crack only, inc. feet.
15. Shark's Fin Left, 5.7
16. Shark's Fin Central, 5.7
17. Shark's Fin Direct, 5.8, climb through the Shark's Fin.
18. Nailhead, 5.8, climb far right side of the Shark's Fin Face.
19. NorthFace Direct, 5.9, stay off corners, climb face direct.
20. NorthWest Corner, 5.9, no corners, stay off walls.

FauxRock Climbing Routes (2)



- 21. EndZone, 5.11, modular holds.
- 22. Straddle, 5.8, straddle offwidth.
- 23-26. Brickyard, 5.6.
- 27. IceCream Cone Direct, 5.8, stay off boulders.
- 28. Humpin' It, 5.9, up face between cracks.
- 29. IceCream Cone, 5.6.
- 30. Overhanging Layback, 5.7.
- 31. The Face, 5.8, stay out of layback crack.
- 32. Face Direct, 5.9.
- 33. Fist Jam, 5.8, up large obvious crack.
- 34. WhiteMen Can't Jump, 5.11, face to the right of FistJam.
- 35. Hang Ten Direct, 5.10, stay off friction.
- 36. Hang Ten, 5.6.
- 37. KarateCrack, 5.6, up bulge between crack and chimney.
- 38. The Grunt, 5.6, climb chimney to top.
- 39. Baby's Butt Left, 5.5.
- 40. Baby's Butt Direct, 5.7, climb straight up to top.

Knots and Their Applications to Rock Climbing

Knots are essential for successful climbing. Knots used for climbing should be simple, strong, easy to untie, and easy to inspect. Each correctly tied knot must have 3 important components.

The 3 components of a safely tied knot are:

- 1. Dress-**
- 2. Set-**
- 3. 3-6" Tail-**

There are several specific terms used when working with ropes and tying knots. **These terms are:**

- 1. Loop-**
- 2. Bight-**
- 3. Working End/Tag End-**
- 4. Standing End-**

There are a plethora of knots used in climbing. Most of the knots are also found in sailing and boating applications. We will focus on the following standard climbing knots.

Everyone should be familiar with these standard climbing knots and their applications.

- 1. Figure 8 Follow-Thru-**
- 2. Figure 8 on a Bight-**
- 3. Overhand-**
- 4. Bowline-**
- 5. Water Knot-**
- 6. Girth Hitch-**
- 7. Munter Hitch-**
- 8. Double Fisherman's-**

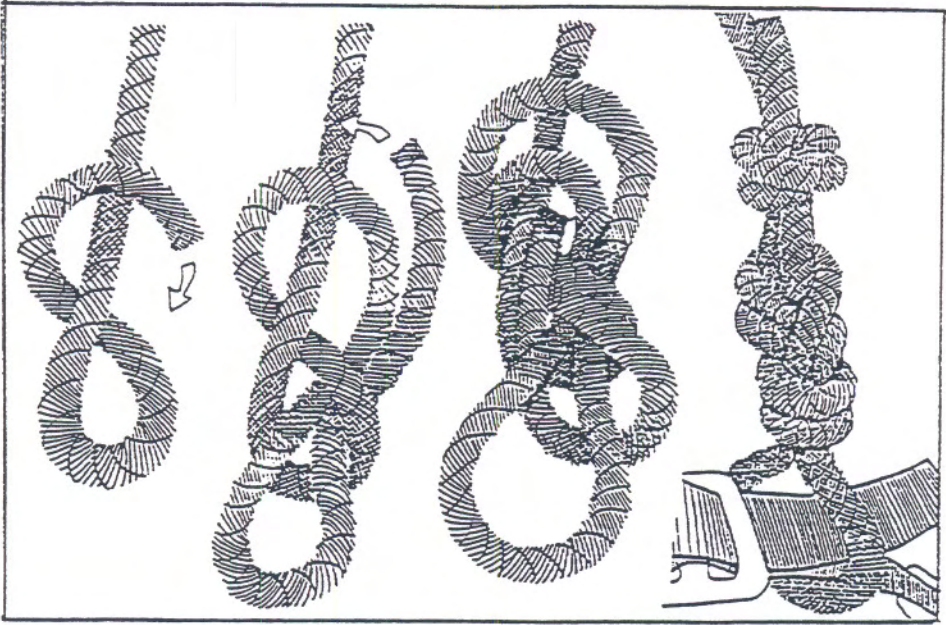


Figure Eight Follow-Through

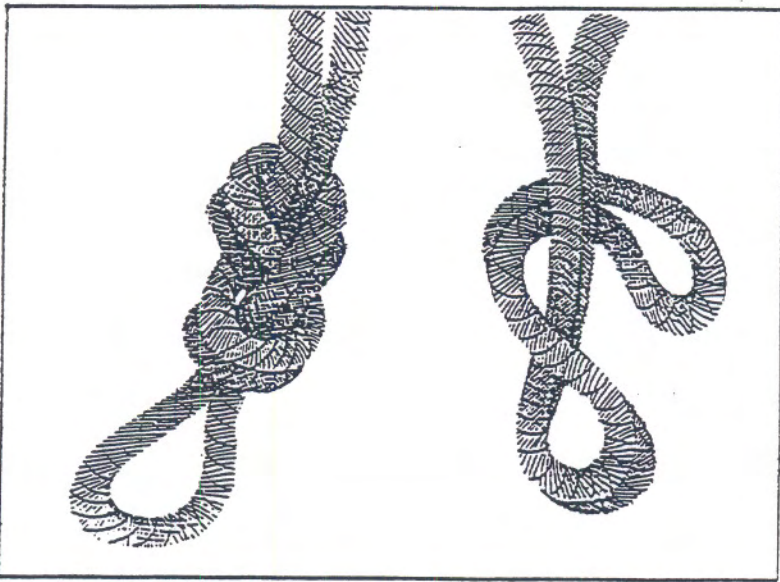
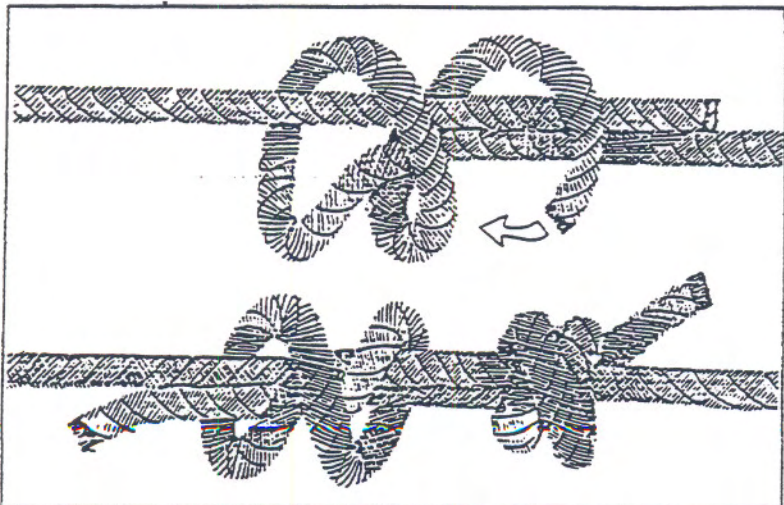
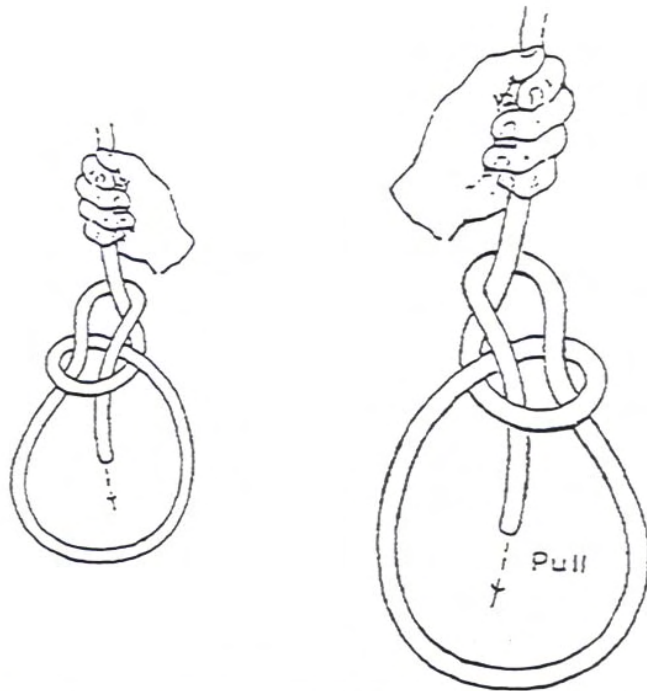


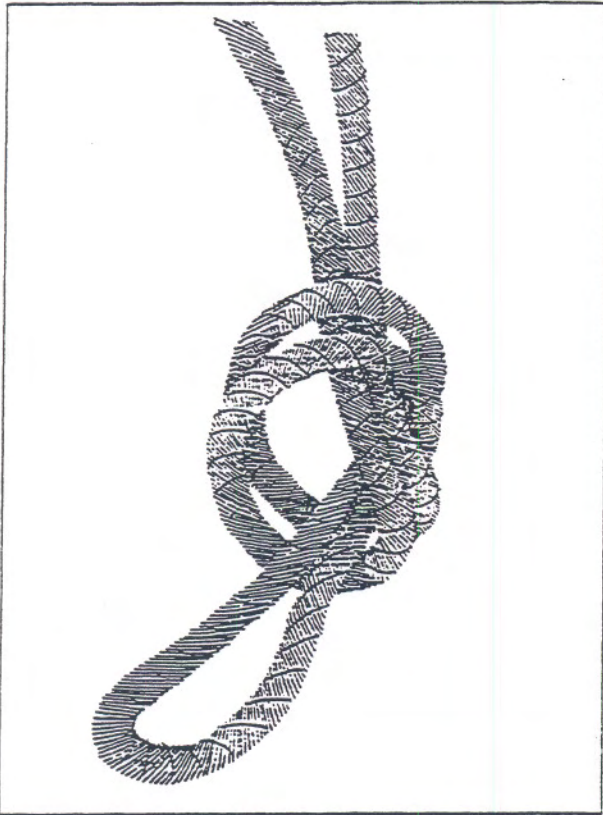
Figure Eight on a Bight



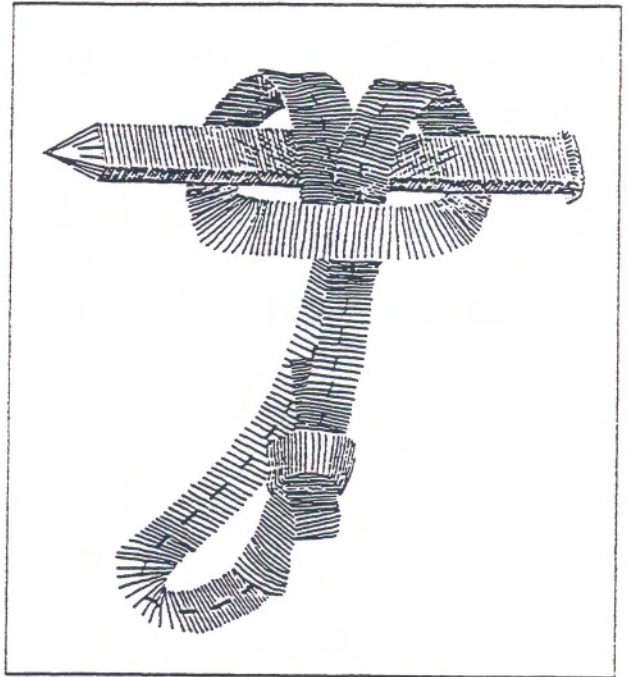
Double Fisherman's Knot



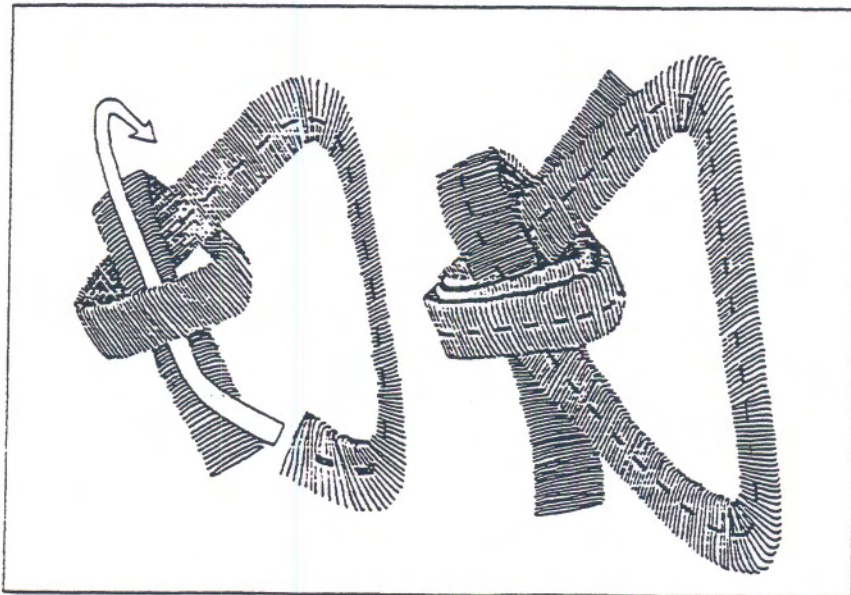
BOWLINE



Overhand Knot



Girth Hitch



Ring Bend
water

The Belay System

Proper use of the rope involves belaying. Belaying is basically the 'safety net' of rock climbing. Without a belay, a fall could mean injury or death. The word 'belay' comes from the nautical term meaning 'to hold fast.' In rock climbing it means one person (the belayer) provides security to another (the climber) with the rope. Any person can tie into a rope and climb, but it takes special hand-eye coordination to properly belay.

The three elements that must comprise all belay systems are:

1. Friction-

2. Position-

ABC's-

3. Anchor-

Hand Movement

Another important aspect of belaying is proper hand motions or rope management skills. Again, it takes special hand-eye coordination and a good bit of practice to ensure the safety of your climber. Remember, your climber is putting their life in your hands as a belayer, so you must be confident in your ability to catch their fall! Every belayer has their preferred way of belaying depending on the situation, but the one thing to remember whichever method of belaying you choose is to **NEVER TAKE YOUR BRAKEHAND OFF THE ROPE...EVER!**

The belayer should be familiar with the following belay hand movements:

1. Palm Up Method -

2. Palm Down Method -

3. Hands Down Method -

Two types of belays are:

1. Dynamic-

2. Static-

Belay Methods

There are many different belay setups that you may want to use depending on the situation you are climbing in. **Every climber should be familiar with the following belays methods:**

- 1. Standing Hip Belay-**
- 2. Sitting Hip Belay-**
- 3. Dynamic Belay with a tether for an anchor-**
- 4. Dynamic Belay with a figure 8 on a bight for an anchor-**
- 5. Dynamic Belay with a munter hitch-**
- 6. Static Belay with a munter hitch-**

Belay Devices

Belay devices allow the belayer to catch a climber's fall and/or lower the climber in a controlled fashion by applying friction to the rope. The belay device, along with a carabiner, places bends in the rope which create friction. For each 90 degree bend, there is enough friction created to slow the rope. There are numerous belay devices on the market, each designed for different uses.

The belayer should be familiar with the following belay devices; their stopping power and ease of taking in and paying out rope:

Belay Devices	Braking Power	Ability to take in and pay out rope
1. Stitch Plate-		
2. ATC-		
3. Tubular (Pyramid)-		
4. Jaws-		
5. Reverso-		
6. Figure 8-		
7. *Munter Hitch-		
8. *Hip Belay-		

*Not typically referred to as a belay device, only included for convenience.

Belay/Rappel Devices

REI has a wide selection of devices that offer a reliable, easy and comfortable method to belay or rappel, providing of course that they're used properly. Make sure the ropes you're using are compatible with your belay and rappel devices. Follow all manufacturer's instructions.

Belaying

- With the large forces possible in a fall, your belay anchors must be solid. Secure your belays with bomb-proof, multi-directional anchors.
- Double-check your partner's belay setup before you leave the ground.
- While you're at it, double-check your harness tie-in as well as your partner's.
- Always keep your brake hand on the rope when belaying. A glove can help prevent rope burns.
- If your figure-8 is designed for belaying, make sure you understand and follow the manufacturer's specific instructions for this use.
- Always use a locking carabiner with your belay device

Rappelling

- Look for a bomb-proof rappel anchor. Never trust your life to just one bolt or piton. Back up anchors wherever possible.
- If doubt exists as to the strength of any existing rappel webbing, use a fresh runner. Runners are cheap compared to your life. Clean off those old raty runners and take 'em down with you.
- Knot the ends of your rope if you can't see that the ends definitely reach the ground. Unfortunately, climbers have died by rappelling off the ends of their rope.
- Check your rappel setup before you head down.
- Check your partner's rappel setup. It's a good idea for the most experienced climber to go last and check the other climbers before they go.
- Wear a glove on your braking hand to help prevent rope burns.
- Bounding rappels shock-load your anchors and your rope. Nasty results can happen from this. Go smoothly.
- Always use a locking carabiner with your rappel device.

Bouldering

Bouldering is rock climbing close to the ground where the consequences of an unchecked fall is not necessarily serious. No specialized equipment is needed except for a pair of climbing shoes. Bouldering is an excellent activity for warming-up, training for longer climbs, perfecting technique, and developing concentration.

Before beginning to boulder, the climber should keep in mind the following safety guidelines:

- 1.
- 2.
- 3.
- 4.

“BARKing” the System

The climber and belayer must ‘BARK’ each other anytime before they climb or setup climbing ropes. ‘BARKing’ the system is a safety check ensuring the climber and belayer have the proper climbing gear and it is attached correctly.

- B-**
- A-**
- R-**
- K-**

Communication of the Belay System

In order for the belay system to be effective, a universal signal or communication system is used. This system is simple and easy to understand by all climbers, no matter what part of the country or world they are from. Once the climber starts the commands, or enters the contract, the belayer is responsible for the climber until the last command.

The standard calls for communicating are as follows:

Climber: “On Belay”-

Belayer: “Belay On”-

Climber: “Up Rope”-

Climber: “That’s Me”-

Climber: “Climbing”-

Belayer: “Climb On”-

Climber: “Slack/ Up Rope/ Falling/ Take/ Transferring”

Climber: “Off Belay”-

Belayer: “Belay Off”-

Slack-

Up Rope-

Falling-

Take-

Climber: “Take Me”

Belayer: “Gotcha”

Transferring-

Climber: “Transferring”

Belayer: “Watching”

Climber: “Squeeze Check”

Belayer: “Thank-You”

Safety on Top of Fauxrock

Fauxrock provides the climber with a unique indoor climbing environment for many reasons. One unique feature is the ability to access the climbing area from the top of the wall. After proceeding up the stairwell behind the wall, the climber will notice there are two access points to the top of the wall. One access is at the black stairs and platform closest to the stairwell, the other access is located down the hallway after exiting the stairwell at the red fire ladder.

Climbers should remember the following when accessing the top of the wall:

- 1. Helmets should always be worn.**
- 2. Use only Steel carabiners to clip into the steel cable (the steel cable will eat through the aluminum carabiner).**
- 3. Clip into the cable immediately after you step off the last step of the ladder or stairs using the transferring commands.**

Transferring Commands

Transferring commands are a common practice in ropes course activities to ensure the participant is safely clipped (secured) into the safety cable. Transferring commands should be used at Fauxrock whenever a climber clips into the steel safety cable on top of the wall. For example, when a climber is finishing a climb and wants to exit the climb from the top; when setting up a rappel; or when a setting up a climb.

The standard calls for communicating are as follows:

Climber: **“Transferring”**

Belayer: **“Watching”**

Climber: **“Squeeze Check”**

Take the steel carabiner and clip it, flip it, screw it down (so you don't screw up), then squeeze check it to make sure its locked!

Belayer: **“Thank-You”**

Lowering

A quick and easy way to get down from a climb is to be lowered down by your belayer. Lowering can be the most dangerous part of the climb. Many **serious injuries** occur during lowering a climber down.

The following guidelines should be followed by the belayer when lowering the climber:

1. **Make sure both hands are on the brake end of the rope.**
2. **Make sure the climber weights the rope before you start lowering.**
3. **Lower in a controlled descent.**
4. **Use the proper commands.**

The following guidelines should be followed by the climber when being lowered.

1. **Only weight the rope after your belayer responds with the proper commands.**
2. **Keep your body in an “L” position when descending the climb. Butt low, Feet high.**
3. **Keep feet shoulder-width apart for added balance.**
4. **Bend your legs at the knees to absorb some of the shock.**

Lowering Commands

Climber: **“Take Me”**

Belayer: **“Gotcha”** (Belayer only says ‘gotcha’ after all the slack is taken up and both hands are on the brake end of the rope)

Fundamental Skills of Climbing

Learning to move over rock is primarily a matter of learning to use your feet by relying as little as possible on your arms and hands. By keeping in mind the fundamental or basic skills of climbing, you should have no trouble becoming an efficient and effective rock climber.

The fundamental skills of rock climbing include:

- 1.
- 2.
- 3.
- 4.
- 5.

Classification of Rock Climbs

In the 1930's Sierra Club mountaineers developed a system of classes, 1 through 6, to describe the equipment and techniques used on a climbing route:

Class 1-

Class 2-

Class 3-

Class 4-

Class 5-

Class 6-

Yosemite Decimal System (YDS)

In the 1950's an extension to the Class 5 description was added to better describe technical rock climbing. The system is called the Yosemite Decimal System (YDS) and is still used today, although the range of climbing has grown in leaps and bounds!

The rating of the decimal system works as follows:

5.0-5.5-

5.6-5.7-

5.8-5.9-

5.10a,b,c,d-5.11a,b,c,d-

5.12 +-

Grading of Rock Climbs

The grading of rock climbs was first introduced in the Yosemite Valley during the 1950's. Grades describe the length of time required for a competent pair of climbers to complete a rock climb.

Grade	Time for a competent pair of climbers to complete
I	
II	
III	
IV	
V	
VI	

Bouldering

Bouldering was once done as a way to warm up for big climbs or done as a way to pass the time on days too rainy to climb. Today, it is one of the most popular forms of climbing.

There are many benefits to bouldering. Whether you just like to boulder, or you like bouldering as a supplement to your climbing, both help develop your climbing ability. Bouldering is great for building strength to pull hard moves (crux). The problems are often short in length, but are often very powerful. Another advantage of bouldering is that it is a great way to practice crux moves only a few feet from the ground. Instead of constantly falling high on a climbing route you can build the physical and mental strength while bouldering to pull the moves for when you go climbing.

Bouldering is also a great way to ease into the sport of climbing. It doesn't cost as much to start since you only need climbing shoes and a chalk bag. While not required, a crashpad is a great investment because it will help protect you when you fall off the rock. Crashpads help cushion a fall, help you from rolling your ankle on rocks and roots below and more importantly, give you that piece of mind when you are pulling hard moves! Another consideration when bouldering is bringing a spotter. A spotter is often one of the best ways to keep you and your partner(s) safe. Plus, it is more fun when you pull down with your buddies!

John Sherman created the open-ended V-scale for rating bouldering problems. You can see the Sherman scale and how it compares to the Yosemite Decimal System. One thing to note is that the V-scale doesn't take into account the consequences of a rough landing on uneven terrain.

Yosemite Decimal System	Sherman V- Scale for Bouldering
5.8	V0-
5.9	V
5.10 a/b	V0+
5.10 c/d	V1
5.11 a/b	V2
5.11 c/d	V3
5.12-	V4
5.12	V5
5.12+	V6
5.13-	V7
5.13	V8
5.13+	V9
5.14-	V10
5.14	V11
5.14+	V12
	V13
	V14
	V15

Harnesses

The harness is your link to the rope. Used correctly, your harness can take you through exhilarating and enjoyable times. REI offers a wide selection for sport, alpine and all-around climbing use.

What to Look For in a Seat Harness:

Alpine Harnesses

- Lightweight—ounces really count on alpine climbs
- Droppable leg loops, so you can answer calls of nature and still stay tied in to the rope.
- Non-absorbent materials, so that if the harness gets wet it won't soak up water like a sponge.
- Adjustability! You'll be changing clothing layers throughout the day to handle changes from pre-day freezing chill to afternoon sunshine.
- If there are gear-racking loops or buckles on the harness, make sure they don't chafe you under the pressure of a pack.

Big-Wall Harnesses

- Lots of padding for comfort during those long hangs.
- Belay/rappel loop adds convenience; reduces confusion.
- On-harness racking takes some of the weight off your shoulder gear slings.
- Full-strength haul loop for attaching a haul rope.

Sport /Cragging Harnesses

- The best choice for an all-around harness.
- Padded leg loops and waistbelt for maximum comfort when working a route and taking falls.
- Belay/rappel loop for convenience.
- Droppable leg loops, so you don't have to take the whole harness off to answer calls of nature; also lets you stay tied in to the rope.
- Gear-racking loops, for fast and easy access to gear without needing to wear a shoulder sling.

Competition Harnesses

- Lightweight, so nothing holds you back.

Chest Harnesses

The UIAA recommends using a chest harness with a seat harness for all climbing. Look for one that offers

lots of adjustability. Of course, never use your chest harness by itself when climbing.

Fit

This is one of the most important aspects of a harness. When trying on harnesses, it's a good idea to wear the type of clothing you'll be climbing in. The waistbelt should be snug but not uncomfortably so and should ride just above the hipbones. You should not be able to pull the harness down over your hips. The leg loops should be snug but not binding. All webbing ends should be doubled back through the buckle and have at least a 2" tail.

Swami belt/leg-loop combos are a great way to get a good fit, since you can buy the components in different sizes to fit your waist and thighs. These combos are designed to be worn together, so don't mix one brand of swami with leg loops from another manufacturer, or vice versa. Also, don't ever wear the swami or the leg loops by themselves—it's terribly uncomfortable and unsafe should you take a fall.

Tying In

Make sure you know how to tie in correctly to your harness. Read, understand, and follow the manufacturer's instructions for your particular harness. Different styles have different tying-in methods. Tying in incorrectly to your harness puts stress on it that it was not designed to take—and could potentially cause it to fail. It's your responsibility to know how to use your harness correctly, along with all your other climbing gear.

Always double back the webbing through harness buckles. Under the impact force of a fall, webbing can pull through a buckle if not doubled back, and send you spilling out of the harness on a fast ride to the ground.

Tie in to the end of the rope with a reweven figure-8 (and back it up with a half-hitch or overhand knot). If you're tying in to the middle of the rope, use a double bowline and secure the loop with a carabiner, preferably a locking. Check knots and buckles frequently throughout the day and retighten if necessary.

Climbing Harnesses

The climbing harness is the important link that connects the climber to the rest of the safety system. Harnesses are found in two basic types: the one-piece seat harness and the swami/leg loop combination. The sit harness is easy to get in and out of and is simple to use. The swami/leg loop combinations allow for a more precise fit, since the components may be sized to fit the individual. Today, many harnesses come in men's and women's sizes taking into account the different body shapes.

Some basic safety concerns for harness use:

- 1.**
- 2.**
- 3.**
- 4.**
- 5.**

Carabiners

Choices, choices. Today's climbers can find just the right carabiners for any climb, but sometimes the choices can seem overwhelming. Let's put them in a few categories to start with.

Oval

- Versatile design makes the oval a fine all-around choice.
- Top and bottom curves are smooth and wide for more gear-holding capacity than D's.
- Excellent for carabiner-brake rappels, due to symmetrical shape.
- Two reversed ovals, with opposing gates, can sub for a locking biner.
- The best choice for aid climbing, since the symmetrical shape holds loads at center of curve; runners won't shift under load as they would in D's.

D-Shaped

- Loads are held off-center, toward the stronger, non-gated side.
- Lighter and stronger than ovals for the same materials.
- Easier to use than ovals.

Bent-Gate

- Designed for fast, easy clip-ins.
- Usually used on the rope end of quickdraws.
- As with any non-locking carabiner, make sure to avoid situations where the rope may cross back over and cause the carabiner to accidentally open. REI tests show that it's not the shape of the gate that matters, but how far out a carabiner's nose sticks to catch the rope and hold it against the gate, and so cause that gate (whether straight or bent) to open. Use a locking carabiner at all critical points.

Locking

- Sleeve locks to ensure gate stays closed.
- Auto-lock and screw-type styles available.
- Use with belay/rappel devices; at belay anchors, on the first bolt of a pitch, and at all other critical applications.

Get the Most From Your Carabiners—Use Them the Right Way

- Carabiners are strength-rated for how much they can hold when used properly. Improper use decreases a carabiner's strength.
- Use your carabiners so they're loaded along the major axis (the long way). If your carabiner is loaded along the minor axis (the shortest dimension), it could fail in a fall.
- A carabiner's gate-open strength is usually less than half that of its gate-closed strength. Use a locking carabiner for all critical applications to ensure the gate stays closed.

Care

- Keep carabiners clean and free of grit.
- Sticky gates can be first cleaned with a non-corrosive solvent; then lubricated with dry graphite.
- Retire any carabiner that has been dropped a significant distance.
- Check your carabiners regularly for stress corrosion cracks around the gate ends. These hairline cracks sometimes develop over time in high-strength aluminum alloy and may reduce carabiner strength by more than 50%. Retire any carabiner with cracks.
- While you're at it, check the rest of your climbing gear for signs of wear. Retire anything that shows signs of damage.

KiloNewtons and You

- A kN (kiloNewton) is a measure of force, which is mass times acceleration. A kN has much more relevance to climbers than would a measure of just mass. Climbers are not static – a falling climber is a mass accelerating under the pull of gravity. For conversion purposes, 1 kN is approximately equal to the force of 225 lbs.

Carabiner specifications listed on other page.

Carabiners

Some safety concerns for using and maintaining carabiners:

- 1.**
- 2.**
- 3.**
- 4.**
- 5.**
- 6.**

Ropes

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The rope is a vital link between your harness and your anchors. REI offers a wide selection of ropes to meet your needs, whether for rock, ice, or mountaineering climbs.

Testing

Standards for rope qualities and handling characteristics are specified by the UIAA (Union Internationale des Associations d'Alpinisme). Climbing ropes must be strong and elastic enough to absorb the impact of a fall, yet offer limited stretch under the weight of a climber.

REI has its own rope drop-test tower built to UIAA specifications to randomly check rope quality; and for research. To test impact force, an 80-kg (176 lbs.) weight on a 2.8 meter length of rope is dropped 5 meters. A single rope must hold 5 such falls, and impact force on the first fall must not exceed 12.0 kN (2,646 lbs.). A double rope must withstand a similar test with a 55-kg weight and a maximum impact force of 7.5 kN (1,654 lbs.).

The UIAA specifies that the maximum elongation under a load of 80 kg is 8% for single and 10% for double ropes. Other tests measure static strength, knotability, mantle slippage, rope weight and diameter.

Single Ropes

- 9.8 – 11 mm diameter.
- Suited for straight-up routes with little zig-zagging.
- Fatter diameter means higher abrasion resistance.
- Lighter than 2 double ropes used together.

Double or Half Ropes

- 8.2 – 9 mm diameter.
- Used in pairs; clipped in alternately to avoid rope drag on routes with complicated lines.
- May be used singly if not subject to severe falls; for example, during basic glacier travel.
- Longer rappels are possible with 2 double ropes than with 1 fat rope.
- Using 2 ropes means less chance of both being hit by rockfall or cut on abrasive rock edges.

Know Your Ropes.

Check the rating on any rope you climb with. Single ropes have a circled "1" on the marking labels at both ends. Double ropes have a circled "1/2". Double ropes are designed to be used only as a matching pair. Don't mix up sizes and brands of lead ropes — the handling, elongation, strength, and other important characteristics are different.

Rope Care and Safety

- A climbing rope is designed for climbing only. Don't use your rope for industrial uses (roof or tree-trimming work, etc.), or towing a car.
- Use a tarp to flake your rope out on, or make sure to keep it off the ground. Dirt particles are extremely abrasive to rope.
- Keep your rope away from harsh chemicals, and keep it protected from excessive sun and heat. Store it in a rope bag when not in use. REI carries several styles of rope bags.
- Never step on a rope. Doing so can grind abrasive dirt particles into it, or abrade it between your boot and the rock or snow and ice. Be extra careful when wearing crampons as those sharp points can slice up your rope.
- Forget movie-style rappels. High-speed, smokin' rappels smoke your rope, and bounding rappels create incredibly high loads on your anchors and rope. Doing this sort of stuff can leave you badly damaged.
- Wash your rope in cold water with a mild, non-detergent soap. Never use bleach. Rinse thoroughly and air dry.
- Before and after a climb, check your rope for signs of abrasion or cuts in the sheath.
- While you're at it, check the rest of your climbing gear for signs of wear. Retire anything that shows signs of damage.

Rope Retirement

This depends on how hard and how long you've used your rope. Yes, ropes aren't cheap, but neither is your life. Guidelines are:

- Occasional use (every-other weekend), replace after 4 years.
- For weekend climbing, replace after 2 years.
- Sport climbing involves repeated short falls as you work a route. This can be really hard on a rope, so replace it after every few months to every half a year. Many climbing gyms replace ropes every few weeks.
- Always replace your rope after it has held a hard fall; if it has flat or soft spots; becomes stiff; or shows sheath damage.
- In doubt? Replace it.
- Keep a climbing diary or logbook to help you track your rope-usage time.

Rope specifications listed on other side.

Webbing, Cord & Runners

Accessory cord has a wide range of uses, from siinging cnocks to making prusik siings. Make sure you select the material and size appropriate for your uses. Compare the strength ratings of various materials. If you are siinging a cnock, it's only going to be as strong as the cord you use to sling it on.

Webbing is used for making your own runners and etriers, among other uses. Webbing comes in a variety of widths and ratings. Again, make sure your choice is strong enough and that the width is appropriate for what you're asking it to do.

Runners – Tying Your Own vs. Buying 'em Sewn

Sewn Runners

- More expensive
- Lighter
- Less bulky
- Less length available to use as a rappel sling; needs to be cut before you can tie it around large anchors such as trees. Do not use sewn Spectra runners for this—the material is too slippery to hold a knot well.

Tied Runners

- Less expensive
- Heavier
- Bulkier
- Easier to use as a rappel sling: just untie and retie around anchor.

Tying

Be sure to melt the ends of cord and webbing in a flame or hot-cut them to prevent unraveling. After cutting Spectra or Spectra A-Cord, pull the core out and cut it 1/4" shorter than the sheath, then "milk" the sheath back over and seal the ends via flame or a hot knife. Then, make sure to use the appropriate knot. This is generally a double or triple fisherman's for cord and a water knot for webbing, but it depends on the actual end use. Tighten the knot under full body weight, then check the tail length. Under the shock-load of a fall, webbing and cord can slip and become untied, so leave tails that are *at least* 1" long for cord and 2" long for webbing. Don't be cheap about a few inches when your life is at stake.

Care

Check your webbing and cord for loose knots, abrasion or cuts. Replace siings and runners every couple of years or at any sign of damage. While you're at it, check the rest of your climbing gear and retire anything that shows signs of damage.

Standard Webbing Lengths Needed for Tied Runners

Single runner 5.5 ft.

Double 9.5 ft.

Triple 14 ft.

Finished length will vary slightly, depending on the knot used.

Climbing Ropes

The climbing rope is probably the single most important piece of climbing equipment. Climbing ropes are constructed to meet the demands placed on it by the climber and by the nature of the climbing environment. A number of characteristics make a climbing rope unique.

Characteristics of climbing rope include the following:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Climbing ropes need to be cared for so they function properly when used.

There are a number of “Do’s and Don’t’s” a climber must remember when caring for a climbing rope:

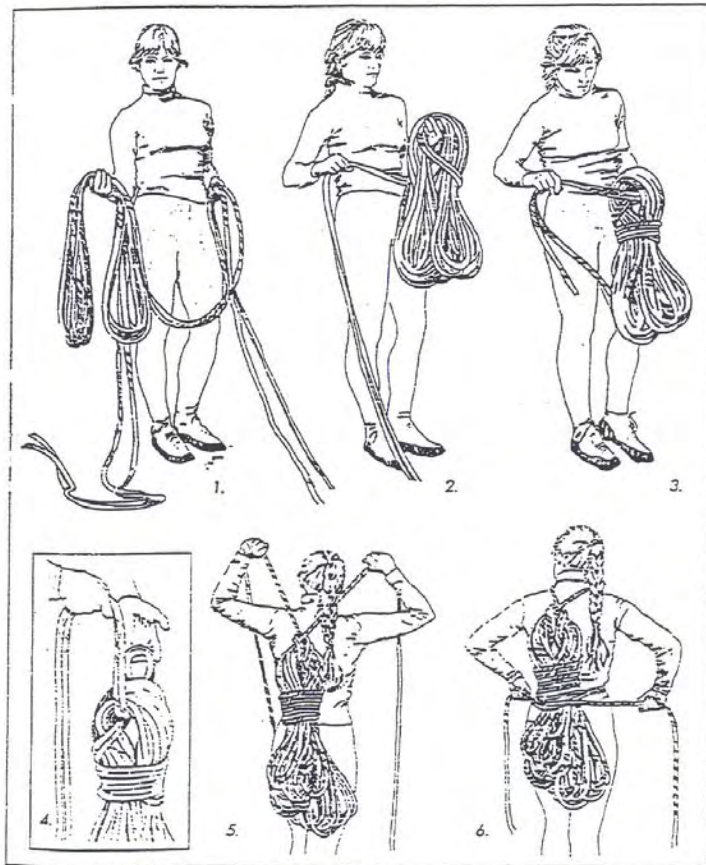
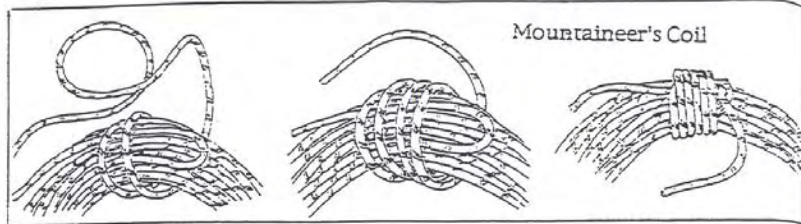
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Coiling Ropes

In order to avoid the frustration of a untangling a tangled rope, it is important for the climber to be proficient at coiling a rope. A properly coiled rope will save the climber time and frustration when setting up climbs.

The climber should be familiar with the following coils:

1. **Mountaineers Coil-**
2. **Backpack Coil-**



Backpack Coil

Helmets

Modern climbing helmets are lightweight, well-ventilated and comfortable. REI supports the use of climbing helmets as a way to prevent or minimize possible injuries.

Wearing a climbing helmet is really the same sort of thing as wearing an avalanche transceiver when backcountry skiing. After all, even climbing areas with clean rock have the occasional loose chunk of granite. Or a fall could slap your head against the rock. And lead climbers have been known to drop a biner or a #4 Camalot down onto a hapless belayer. But the best reason for buckling-on a lightweight, well-ventilated climbing helmet is not from fear; but because you love to climb—and want to keep on climbing.

All climbing helmets sold at REI meet UIAA specs. This means that the helmet model achieves specifications for:

- Shock and energy absorption.
- Conical impact.
- Security of retention straps.
- Ventilation standards.

Replace your helmet:

- After a significant hit.
- At any sign of damage
- Every 5 years.

While you're at it, check the rest of your climbing gear for signs of wear. Retire anything that shows signs of damage.

Helmets

Helmets help protect your head from the impact suffered during a fall or from falling rocks, equipment, or objects. **Some characteristics to look for in a high-quality helmet include:**

- 1.
- 2.
- 3.
- 4.
- 5.

Advanced Climbing Techniques

The more you climb the more difficult climbs you will try and be challenged with. As the holds get smaller, there are many techniques you can use to progress up the climb. Climbs can be grouped into two types of climbing, face and crack.

Climbers should be familiar with the following advanced climbing techniques:

A) Face Climbing-

- 1. Smearing-**
- 2. Edging-**
- 3. Handholds-**
 - a. Open Grip-**
 - b. Crimp-**
 - c. Ring Crimp-**
- 4. Mantling-**
- 5. Slab/Friction-**
- 6. Overhangs-**
- 7. Dynos-**

B) Cracks-

- 1. Fist Jams-**
- 2. Liebacks-**
- 3. Stemming-**

Climbing Systems

To become more familiar with the sport of rock climbing a number of terms that describe the different methods or systems of climbing should be understood:

- 1. Top Rope Climbing-**

- 2. Free Climbing-**
 - a. Sport Climbing-**

 - b. Clean (Traditional) Climbing-**

- 3. Aid Climbing-**

- 4. Solo Climbing-**

- 5. Free Solo Climbing-**

- 6. Multi-Pitch Climbing-**

- 7. Adventure Climbing-**

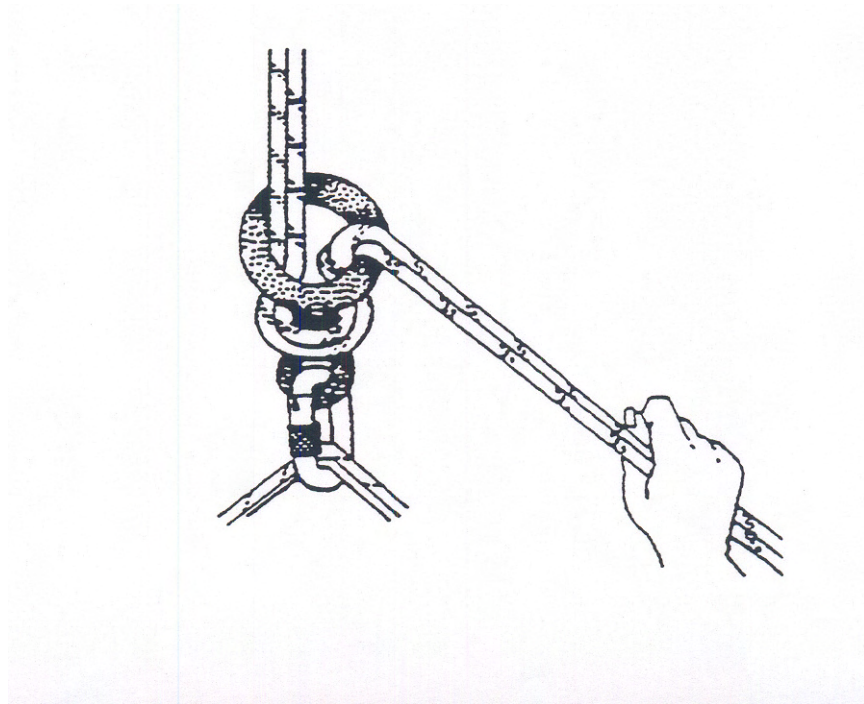
Rappelling

Rappelling is a technique used in rock climbing for descending a rockface. It is one of the easiest and simplest tasks to master, yet it is probably the most dangerous.

To execute a rappel safely keep in mind the following safety procedures:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

The figure eight descender is used to apply friction to the rope. It is one of the simplest and safest rappel techniques to learn. Once the rope is connected correctly, it cannot come out of the descender.



BASIC ROCK GLOSSARY

Aid, aid climbing. Leaning, standing, or pulling on the rope or anchors in order to rest or make progress, as distinguished from free climbing. To climb by means of aid: he aided the route. Formerly called direct aid or artificial aid.

Anchor. Any means of attaching the rope to the cliff. It may be a natural anchor, such as a tree or a chockstone, or an artificial anchor provided by the climber, such as a bolt or a chock. To attach the rope or oneself to an anchor: she anchored to a tree.

Balance, balance climbing. An even distribution of the climber's weight over the feet or hands. Climbing by such means in order to minimize reliance on hand, arm, and shoulder strength.

Belay. Any means of checking a falling climber by means of the climbing rope. A body belay relies for the necessary friction on wrapping the climbing rope around the Belayer's body. To take in or payout the rope *in* a manner that will permit one climber, the belayer, to check a fall by another.

Belay plate (Sticht plate), belay ring. A small metal plate or ring with holes through which the climbing rope passes. It assists the belayer in checking a fall.

Big wall. A route of such length and sustained difficulty that climbers usually spend several days on it.

Bolt. An artificial anchor placed in a hole drilled in the rock for the purpose, and fitted with a metal bolt hanger for attaching a carabiner and the climbing rope. Usually, the bolt and hanger are fixed, or left in place for the use of subsequent climbers. See also Fixed piton regarding the ethics, which govern fixed anchors.

Bombproof. Absolutely solid and secure against failure under the impact of a fall, usually applied to anchors.

Boulder. A very small cliff or rock close to level ground, on which the climber may make a maximum effort without the protection of a climbing rope. To climb as if on a boulder, sometimes on a long route with a rope, making repeated efforts to work out a complex sequence of moves: he bouldered the crux of the climb.

Bucket hold. A large, secure handhold around which the climber may curl his finger.

Carabiner. An aluminum alloy link with a gate that permits insertion of the climbing rope or a runner, used mainly for attaching the rope to anchors. The rope may be tied to the carabiner or may simply run through it. Also called a biner in the United States and a crab in Great Britain.

Ceiling. A severely overhanging section of rock extending several feet or more out from the wall. Also called a roof.

Chimney. A crack or fissure in the rock wide enough to accommodate the climber's body. A squeeze chimney is barely wide enough, so that maneuvering is difficult. To climb a chimney by pressing against the two sides at once with hands, back, knees, or feet.

Chock. An artificial anchor consisting of a piece of metal or other rigid material fitted with a rope sling or wire cable for attaching a carabiner and the climbing rope. Chocks come *in* a great variety of shapes and sizes. They are lodged *in* cracks or hollows *in* the rock simply with the climber's fingers and are ordinarily removed as the *climbing* party proceeds. Also called a nut.

Clean. To remove all the anchors placed on a pitch by the leader. This *is* usually done by the second or third person as he climbs.

Clean climbing. Climbing using only natural anchors, artificial anchors placed only with the climber's fingers, or else pitons or bolts fixed permanently in the rock. Clean climbing *is* an ethical and aesthetic response to the damage done to the rock by driving and removing pitons with a hammer.

Cling hold. A hold on the rock obtained by pulling or clinging with the fingers. The climber pulls sideways on a sidecling hold and upward on an undercling hold.

Counterbalance. A movement or placement of one part of the body that balances a movement by another part. For example, a leg stretched out to the left may counterbalance a reach to the right for a handhold.

Crack Climbing. The specialized set of techniques involving lodging the climber's body or wedging the hands and feet in cracks *in* the rock, as distinguished from face climbing.

Crux. The most difficult section of a pitch. The crux pitch is the most difficult pitch on a route. A pitch or a route is rated by the difficulty of *its* crux. **Decimal system.** A system for rating the difficulty of a pitch or a route on the basis of the difficulty of its crux. For this purpose a decimal point and a numeral are appended to the class of the climb. Currently the numerals range from 0 for the easiest climbs to 13 for the most difficult. For example, a route may be rated class 5.9 and its three pitches may be rated 5.4, 5.9, and 5.8, respectively.

Dihedral. A configuration of rock where two faces or walls come together at more or less a right angle like the corner of a room. Also called an inside corner or an open book.

Dynamic belay. A method of reducing the impact forces generated by a falling climber by allowing the rope to slip through the belayer's hands. This method has been considered obsolete since the introduction of modern kernmantle ropes, although it still may have some application. There is a limit to how large a force the belayer can withstand before the belay performance becomes a dynamic one.

Edging. Climbing by precise placement of the edges of the climbing shoe soles on tiny ledges of rock, as distinguished from smearing.

Exposed, exposure. Describes a situation where an unchecked fall would be long and probably lethal. Most climbers want the protection of a rope and anchors on exposed terrain of significant difficulty. The psychological impact of exposure and thus the apparent difficulty of the climbing tends to increase with height above the ground.

Face. A relatively unbroken or featureless expanse of rock between ridges or crack systems.

Face climbing. The techniques--mainly balance climbing, edging and smearing with the feet, mantling, and stemming--used to climb faces, as distinguished from crack climbing.

Fifth class climbing. Free climbing protected by the rope and intermediate anchors between the leader and the belayer. Also called class 5.

Finger lock. A hold in a crack obtained by wedging one finger against another.

Fixed piton. A piton left in place in the rock permanently for use by subsequent climbers. The prevailing climbing ethic specifies that the first ascent party determines what pitons, if any, will be fixed on a route. The same ethic applies to bolts and fixed chocks. Subsequent parties may replace worn-out anchors but should not fix additional ones.

Flake. A thin slab of rock attached to the main wall or lying against it. The term applies to features which range in size from less than an inch to many feet. A flake may provide a foothold, a natural anchor, or a whole multi-pitch route.

Free Climbing. Climbing using only the holds the rock itself provides, as distinguished from aid climbing. The rope and anchors may be used for protection, but the climber does not lean, stand, or pull on them.

Free rappel. A rappel down an overhanging wall where the rappeller is hanging in space free of the wall.

Free solo. Free climbing without the protection of the rope and anchors. Also called third class.

Friend. A complicated camming chock which adjusts automatically to a continuous range of crack sizes and shapes.

Harness. An arrangement of cloth straps which secures the climbing rope to the climber's body and serves to distribute his weight or the impact force of a fall for greater comfort and safety. In the United States most climbers prefer a simple seat harness consisting of a waist band and leg loops.

Heel hook. A foothold using the back of the climber's heel.

Hexentric. An artificial chock with an asymmetric hexagonal cross-section, manufactured by Chouinard.

Horn. A projecting piece of rock, which may serve as a natural anchor.

Jam. To lodge some body part, commonly a hand or foot, tightly *in* a crack. A hold on the rock obtained by jamming: She set her fist jams in the crack very carefully.

Kernmantle. Describes the construction of rope generally used for climbing, which consists of a woven sheath (mantle) over a core (kern) of braided, continuous filaments.

Lead. To climb first, taking the rope up and placing anchors, as distinguished from second. .The act of leading or, simply, a pitch which is led: he placed four chocks on the first lead.

Leader. The climber who leads a pitch, as distinguished from the second.

Lieback. A climbing maneuver which consists of pulling sideways with one or both hands and pushing in the opposite direction with one or both feet. The classic application *is* in climbing a crack with one edge offset from the other so that there *is* a vertical surface for the feet to push against while the hands pull against the other edge of the crack. To employ the lieback technique.

Mantle, mantleshelf. A flat ledge above an overhang or a face devoid of holds, such that the climber must pull himself up to the ledge with his arms and then heave up over his hands until he can place a foot on the ledge and stand up. The technique for mounting a mantleshelf. To employ this technique, which can sometimes be done on minimal or steeply sloping holds.

Opposition. A variety of techniques including stemming, liebacking, and chimneying, *in* which the climber pushes or pulls against two opposed surfaces of rock simultaneously.

Pendulum. To swing or fall sideways at the end of the rope. A sideways swing or fall, generally on a traverse or diagonal section of a route.

Pinch grip. A handhold obtained by squeezing the rock between the thumb and the fingers.

Pitch. A section of a climb between two belay stances, often determined by the length of the climbing rope, that is, a distance of 50 meters or less.

Piton. An artificial anchor consisting of a metal spike which is driven into a crack in the rock with a hammer and which has an eye for attaching a carabiner and the rope. Also called a Pin and in Great Britain a Peg.

Protect. To place anchors, natural or artificial, in order to shorten the length of a fall. Protection refers to the anchors so employed: the leader had climbed twenty feet above her last protection. Also called Pro.

Push hold. A handhold obtained by pushing against the rock.

Push-pull combination. The use of one hand to push against the rock while the other pulls, mainly *in* stemming when a foot *is* lifted to the vicinity of the pushing hand.

Rack. The selection of chocks and carabiners carried by the leader, usually on a sling over the shoulder.

Rope drag. Frictional resistance to the movement of the rope exerted by the rock, the anchors, the wind, and so on. It impedes the movement of the leader and may lift runners off horns and chocks out of cracks.

Route. An established or selected path of climbing on the rock. Also called a line.

Runner. A short length of rope or webbing tied or sewn into a loop, used for many purposes *in* climbing. Runners are most commonly made from about 5 feet of one-inch tubular nylon webbing. Formerly called a slide.

Slab. A large flake, usually several feet or more across. See **Flake**. The term also applies to smooth, low-angle rock climbed mainly by friction holds (smearing) or by edging on small holds; however, such rock *is* more usually called simply a face or low-angle face.

Sling. A short length of rope or webbing threaded through a chock and tied *in* a loop, used for attaching a carabiner and rope to the chock. Also a stirrup; see **stirrup**. Formerly, a runner.

Smearing. Climbing by placement of the flexible, soft rubber sole of a climbing shoe on a smooth slope or over small holds so that it adheres by deformation and friction, as distinguished from edging.

Stack. To press one finger, foot, chock, or piton down on another, or to wedge them side by side, *in* a crack *in* order to obtain a stronger or broader hold or anchor.

Stemming. A position or stance on the rock with the feet spread wide apart horizontally. Both feet maybe on the same level, or one foot may be under the climber and the other high and far to the side.

Stopper. A wedge-shaped artificial chock manufactured by Chouinard.

Swami belt. A waist band made from nylon webbing wound *in* several turns around the climber's waist and tied with a suitable knot. See **Harness**.

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