2019 Program Handbook

AMC BOSTON CHAPTER

ROCK PROGRAM

Revised and edited by Christopher Camejo

"The best climber in the world is the one having the most fun!"– Alex Lowe

"Life is either a daring adventure or nothing at all." – Helen Keller

"The rock is a field of battle between our weakness and our strength." – Royal Robbins

"The exaltation one can get in the presence of mountains can be a memorable lesson in humility and an aid to self-realization." – Fred Beckey

Revised 2019-03-03

WARNING: Climbing is a dangerous sport. You can be seriously injured or die.

Do not depend solely on any information or opinions contained in this handbook. Your climbing safety depends on your own judgment based on competent instruction, experience, and a realistic assessment of your climbing ability. If you are unwilling to assume complete responsibility for your safety, do not use this handbook.

The handbook editor, authors, Rock Program Organizing Committee, and the Appalachian Mountain Club expressly disclaim all representations and warranties regarding this guide, the accuracy of the information herein, and the results of your use hereof, including without limitation, implied warranties of merchantability and fitness for a particular purpose. The user assumes all risk associated with use of this handbook.

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Illustrations for “Knots” by Judy Bayliss.

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Introduction

Welcome to the AMC's Boston Chapter Mountaineering Committee's Rock Climbing Program! Boston has a very active climbing community dating back to the 1920's when some of the first routes at Rattlesnake Rocks were attempted. Boston's AMC climbers have been pioneers, establishing first ascents in some of the world's most challenging venues: Alaska, Canada, and elsewhere.

In more modern times, graduates of the AMC Rock Climbing Program have gone on to put up some of the hardest rock routes in the Northeast, and made first ascents of some of the world's most difficult mountains. That pioneering spirit and tradition is carried on today by you, the participants in this program.

The Boston climbing community has a wide range of different climbers; all sharing four common passions: for the outdoors, for climbing, for individual challenge, and for the community. You are about to embark on an exciting journey; we sincerely hope this program will enrich your outdoor experience.

Our Volunteers

We depend entirely on volunteers to make the Rock Program happen. Everyone you see volunteers their time every year to build the Boston climbing community. We would like to express our appreciation and gratitude to all the people who help make this program possible.

In particular, we would like to acknowledge the efforts of several groups of people. First, there is the Organizing Committee that starts working months ahead of the program to make all the arrangements for the program. Then there are the Weekend Leaders who orchestrate the program weekends. They are the ones who absolutely, positively, have to be there each day; arriving first, leaving last, and handling any emergencies, all while maintaining an appearance of calm and control. Next are our instructors; without them we could not carry on the oldest continuous, and most successful volunteer-led rock climbing instruction program in the world! Finally, there are our assistants, most of whom took the program recently and have that contagious enthusiasm for rock climbing.

Please take a moment to say "thank you" personally to all our volunteers; that personal note is what keeps them coming back year after year.

Overview

The AMC Rock Program covers the basic skills to climb safely outdoors. It can lay the groundwork for toproping or sport climbing on your own, but our main focus is on preparing students to be a second on multi-pitch trad climbs.

Requirements

Besides an interest and willingness to learn about rock climbing, the only requirement is that you have a harness, a mountaineering helmet, 2 locking carabiners, and a belay device that can handle 2 ropes. If you need this equipment we will loan it to you at no cost (though a deposit is required).

Rock climbing shoes are nice to have, but are not absolutely essential; students have completed the course in sneakers or hiking boots. All other gear is provided for the program weekends, but if you have your own personal equipment, please bring it. We advise marking your carabiners and other hard gear with colored tape or nail polish so you can identify it.

No prior climbing experience required – every year we have everyone from “never-evers” to experienced sport climbers who enjoy the program.

Schedule

Program Dates

Knots Night	Tues, March 26 7-9pm	Required
Belay & Anchors Weekend	Sat, April 6 AND Sun, April 7	Both days required
Rappel Weekend	Sat, April 13 or Sun, April 14	Attend either day
Open Climbing Day	Sat, April 20	Optional
Ascend Weekend	Sat, April 27 or Sun, April 28	Attend either day
Graduation Weekend	Sat, May 4 or Sun, May 5	Attend either day
Crow Hill Climbing & BBQ	Sat, May 11 (Rain Date May 12)	Optional

Weekend Agenda

During Program Weekends the formal instruction starts at 8:15am, please be at Quincy Quarries at or before that time. Formal instruction goes until around 1-2pm.

We will have top-ropes set up and lead climbers available until around 4:30pm (weather dependent) during the afternoons, once groups have finished their formal instruction, and all day on Open Climbing Day. You can continue to climb, practice belaying, review other skills, and work on Program Requirements during these Open Climbing sessions.

Remember, you will have Program Requirements to get done outside of the formal instruction so make sure to attend at least some Open Climbing sessions.

You are welcome to come to Open Climbing sessions during an afternoon when you are not taking formal instruction or any time on Open Climbing Day.

Missed Program Weekends

Both days of Belay & Anchors weekend are required and cannot be made up; this is the foundation of our program.

We have limited ability to offer makeups, so please come to the regular weekends if you can. You will also have a better experience if you come on the regular weekend with everyone else.

However, if you must miss one of the instructional Program Weekends we will attempt to offer a makeup session where you can make up one (and only one) of the other weekends. We may schedule this during Open Climbing Day or during the afternoon of another program weekend. This will depend on the program schedule for the year and how many other students need to make up the same session. Please contact the Program Director at rock@amcbostonclimbers.com as soon as possible if you know you will have to miss an instructional Program Weekend so we can try to make arrangements.

Materials

At Knots Night, you will receive a packet with the following:

- The Program Handbook – this booklet.
- Our textbook: Mountaineering - The Freedom of the Hills 9th edition.
- A “Green Book” in a ziploc bag with a pen.
- A sewn double length nylon sling.
- A length of climb-spec accessory cord for a Prusik loop.
- A 6-8’ section of rope for practicing knots – this must be returned at the end of the program.

Communications

Website

Rock Program information can always be found on our website at:
http://www.amcbostonclimbers.com/rock-program

This includes the program schedule, documents (including an online version of this Handbook), and an FAQ.

Email

If you have any questions during the program, you can email us at:
rock@amcbostonclimbers.com

We have an email distribution list for official Rock Program announcements. All emails will come from rock@amcbostonclimbers.com and we recommend adding this email address to your address book to make it less likely that program emails will get picked up by junk mail filters.

If you are a student this year you should have already received an email welcoming you to the Rock Program and providing details for Knots Night. If you somehow made it to Knots Night without seeing this email please check your junk mail folder and, if you still can't find it, contact the Program Director at rock@amcbostonclimbers.com immediately.

Program emails are sent via MailChimp and each message will have an unsubscribe link at the bottom. If you unsubscribe you won't receive the rest of the Program emails with attendance sheets, carpool lists, feedback surveys, and important last minute updates.

Weekend Coordination

Each week we will send out a survey to get your feedback on the instruction you just received as well as an attendance planning sheet to help us allocate our instructors and assistants for the next program weekend. Please fill these out as they help us keep the Rock Program running smoothly.

We will also set up an online spreadsheet to facilitate carpool arrangements students. We encourage carpooling in part because it's a great way to get to know your fellow students (who may be your climbing partners for years to come!).

Social Media

There is a Facebook group for Rock and Ice Program students, instructors, and assistants to come together and share stories, post photos, get advice, find partners, and organize trips at https://www.facebook.com/groups/amcbostonclimbers

Post-Program Events

There are three AMC Boston Mountaineering Committee events right after the Rock program to get your climbing career moving. (Note that these events are not part of the Rock Program.) Mark your calendars now!

New Seconds Weekend: This event is open only by invitation to graduates of the Rock Program. New seconds (i.e., Rock Program graduates) will team up with experienced leaders for a weekend of multi-pitch trad climbing at the Shawangunks (a.k.a. the Gunks) in the Mohonk Preserve near New Paltz, NY. The Gunks are a major east coast climbing destination and have a storied history dating back to the 1930's. Climbs at the Gunks are typically 2-3 pitch trad climbs, with many routes at moderate difficulty ratings that have overhanging roofs/ceilings, great views, positive holds, and lots of exposure.

Memorial Day Weekend at Acadia: Start your summer climbing on the picturesque sea cliffs of Acadia National Park or any of the trad climbing areas in the interior of Mount Desert Island. Don't forget a stop in to Bar Harbor for seafood and ice cream!

Sport Climbing at Rumney Weekend: Come clip bolts with us for a weekend at one of the premier sport climbing destinations in the country: Rumney Rocks in New Hampshire's White

Mountain National Forest. There's something for everyone, with hundreds of routes ranging from 5.0 all the way up to an intimidating 5.15a. There are also trad climbing opportunities nearby in case sport climbing isn't your thing, including Kinsman Notch, Echo Crag, and the closest thing New England has to Big Wall climbing: Cannon Cliff.

The AMC Boston Chapter Mountaineering Committee also hosts Open Cabin weekends in the White Mountains and Climbing Gym Nights throughout the season so you can continue to climb with your newfound friends. Additional events include a Fall Frolic climbing event at the Gunks, a climbing trip to the Adirondacks, and further instructional classes including a Self-Rescue class and the AMC Ice Program so you can continue your climbing education.

Program Rules

Be responsible for your own and for others' safety.

Rock climbing involves certain inherent risks. These are minimized where possible, but climbing requires vigilance from all program participants. Each participant is responsible for his or her own safety and for the safety of those around them.

We reserve the right to terminate anyone's participation in the program due to safety or other issues. Harassment of any kind is not tolerated.

Emergencies

- If there is a serious accident, call 911 first.
- For any accident, send someone to get a Weekend Leader.
    - The Weekend Leader has a more detailed Emergency Procedure to follow as well as Emergency Contact and Medical Conditions information that may be required.
- If you have medical or rescue training and can assist during an emergency please make the Weekend Leader aware immediately.

Arrival

- All volunteers and students must sign in on arrival for a Program Event.
- All volunteers and students must have signed an AMC Waiver in the current Program Year in order to participate in a Program Event.

Safety

- Understand the risks involved in rock climbing.
- Immediately intervene if you observe unsafe behavior, send someone to get a Weekend Leader if you can not intervene or if the behavior continues.
- Helmets are required at all times, at the top and bottom of the cliffs.
    - Helmets must be designed for climbing; other helmets are not allowed.
- Everyone must be wearing a climbing harness that is attached to an anchor via a locking carabiner when approaching the edge of a cliff.
    - The rule of thumb is to be anchored in whenever the feet are within 1 body length of the cliff edge. More distance may be prudent depending on the severity of the terrain approaching the edge.
    - Instructors will demonstrate proper anchoring technique to Students on the first day of the Program.
- Double check knots and harness buckles on yourself and those around you.
- Be careful not to knock any rocks down the cliffs; there may be someone below.
- Call "ROCK!" if anything hazardous is dropped over the cliff edge.
- No soloing (climbing without a rope and belay).

How the Program Works

Our program is run in a dispersed fashion, so it is up to you to make sure you get everything done to complete the program.

Green Books

During the program, you will get skills and requirements signed off in your Green Book. When you have completed all the required skills and requirements on Graduation Weekend, you will turn in your Green Book to a Weekend Leader to be graduated from the program.

You will generally be with a different instructor each program day. Make sure your instructor signs your Green Book each day – you may not see him or her again before the end of the program, or that instructor may not remember what you did a week later!

Your Green Book is the only record of what you have done in the program, so that do not lose it, and remember to bring it every weekend! (However, if you do forget your green book, ask a weekend leader for a replacement page for that day.)

Program Weekend Skills

Each program weekend/day has a page in the Green Book with required skills. You can expect to complete the weekend skills during the formal instruction period. Note that some weekends have required skills for which you will go to a “station” to complete.

Some program weekends have optional skills that your instructional group may or may not do during the formal instruction period. You can ask a weekend leader or any instructor if you are interested in doing these skills afterwards.

Program Requirements

On the first two pages of the Green Book are three kinds of program requirements that you must complete outside the formal instruction period. We recommend getting as many as possible (or even all) of these Program Requirements done before Graduation Weekend.

There are three types of Program Requirements.nly climbs and belays done after Belay & Anchors weekend instruction is complete count for these requirements:

1. Program Climbs – We require that you attempt to climb four (preferably different) climbs. Hopefully you’re here because you actually want to climb, so this should be an easy requirement to meet. Just make sure you ask an instructor or assistant to watch before you start the climb so they can sign off your Green Book.

2. Program Belays – We require that you do three top-rope belays after Belay & Anchors weekend. These must be observed by an Instructor, so make sure you ask someone to watch before you start. As part of each belay, you must catch a “surprise” fall.

3. Follow a Leader on a Trad Pitch – You will go through the entire process of climbing a trad pitch with a leader. Since the focus of this exercise is the process and belaying, it will generally not be on a difficult climb.

Before you do this requirement, you should:

- Understand the process for climbing a trad pitch. (Read the section “The Trad Climbing Process” on page 36.)
- Know the relevant knots.
- Be confident in your lead belaying. Grab an instructor for some practice or feedback if necessary! We will have opportunities to practice lead belaying each afternoon. (Also, read the section “Belaying for Lead Climbing” on page 38.)

Some Advice

To get the most out of the program, we have a few suggestions...

Ask questions and be an active learner

We want students to become independent climbers. This means that by the end of the program, you should be confident that you are tying knots correctly, building good top-rope anchors, belaying competently, able to set up your own rappel, etc. – and not be dependent on an instructor to check what you’re doing. Ultimately, you must be responsible for your own safety while climbing. To reach this level of competence:

Ask questions – If you don’t understand why something is done a certain way, ask a question. If you don’t understand the underlying principles, ask a question.

Practice – Go over your knots at home until you can tie them quickly and correctly. Take advantage of any opportunity to practice belaying. If you want to practice a skill more, talk to your instructor or a weekend leader.

Volunteer – When an instructor asks for someone to start building an anchor, don’t just sit back and watch. Don’t be afraid to make mistakes; that’s how we all learn. (Better to make a mistake here, where it will be caught and where we will all learn from it, than when you are out climbing on your own!)

We encourage you to go with a different instructor for each day of the program. You will get different presentations and different opinions from each instructor. Use this to enhance your learning experience. There is generally no single correct way to do anything in rock climbing, and each instructor will have his or her own set of practices and as well as perspectives on efficiency and risk.

Learn to trust the system

We require you to climb and take falls for two reasons. First, other students need practice catching a fall while belaying. Second, you need to learn to trust the system – that the anchor will hold, the belayer will do his or her job, the rope will become taut, and your harness will keep you from plummeting to the ground. Some fear of falling is natural (and part of the thrill of rock

climbing!) While intellectually knowing how the system works helps overcome this fear, there's no substitute for taking falls until you develop an intuitive confidence in the system. Then you can focus on enjoying the climbing rather than on the fear of falling.

Meet people

This program is not just about learning skills for rock climbing; it's also an opportunity to meet kindred spirits! Get to know your fellow students, the instructors, and the assistants. Many students end up climbing with people they meet through the rock program for years afterward.

If you want to get out climbing a lot, you will need to be proactive. Don't be shy about asking instructors or assistants to take you climbing after the program. It will be up to you to take the initiative though: you can offer to organize a day trip or a weekend, to drive (or maybe just mention "beer"!) Many of our instructors and assistants are happy to help our rock program graduates get started leading sport or trad after the program.

Program Weekends

Beforehand

- Complete the online feedback for the prior weekend/day.
- Put yourself on the Attendance Sheet for the next weekend.
- Get on the Carpool Sheet if you want to.
- Do the reading (see each program weekend page for details)
- Practice your knots, learn new knots

Where

The program is held at the Quincy Quarries in Quincy, MA. Park in the large parking lot on Ricciuti Drive. If that lot fills up, you can park on Ricciuti drive on the opposite side of the street. (See the Quincy Quarries section on page 15 for a map.)

NOTE: Do not leave gear or valuables visible in your car! While rare, there have been a few incidents over the years…

When

Arrive at 8:15am. The formal instruction will run to around 1-2pm. After that, you can climb, practice skills, and work on program requirements. We start packing up around 4:30pm and leave by 5:00pm.

What to wear

Dress warmly and be prepared to be outside all day. There will be a lot of standing around during the instructional part of the day, so you need more than that light jacket you use to run from your house to your car. Also remember, we teach rain or shine! It is early spring, so the weather can change dramatically – you should be prepared to be waterproof from head to toe (hat/hood, jacket, pants, shoes) if there's any chance of rain. The ground in the Quarry can be pretty soggy, even if it's a clear day, so plan your footwear accordingly.

What to bring

You must bring:

- Climbing Harness
- Double length sling
- 2 locking carabiners
- Belay device
- Climbing Helmet
- Your Green Book
- Your practice rope (to demonstrate and learn knots)

If you forget any of these things, see a weekend leader; they have a few extras you can use for the day. You do not need to bring the textbook or this handbook.

Other things to bring:

- Rock climbing shoes – if you have them
- Food: lunch, snacks, goodies to share :-)
- Water or other (even hot) drinks
- Extra layers, hat, gloves, etc.

When you arrive

Go to the small parking lot on Ricciuti Drive. The weekend leaders will be setup there.

- First, sign in at the Student Sign-in Station (not the Volunteer Sign-in Station).
- Then see the weekend leader who is arranging students into instructional groups. (The other weekend leader(s) will be coordinating the instructors and assistants.)

The 2 or 3 weekend leaders (different people each weekend) are responsible for coordinating everything for that weekend. See one of them if any issues arise during the day. Their names will be on top of the Attendance Sheet and they will usually be located either in the small parking lot (during the morning) or under the large tree just inside the Quarry (the rest of the day).

Notes:

- There is a porta-potty at the small parking lot that we arrange for during the program.
- The weekend leaders have a first aid kit if you need a band-aid or more.

Instructional Groups

Your group for the day will generally consist of 4-6 students, an instructor, and 1-2 assistants. We encourage students to go with different instructors each weekend/day. You will get a variety of perspectives and different presentations on rock climbing this way.

Each instructional group will have a bag of gear to use for the day that includes ropes, slings, carabiners, etc. Students will be asked to divide this gear up amongst themselves to carry to the cliffs. All this gear must be returned to the weekend leaders at the end of the day. You'll have a short hike (no more than 5-10 minutes) to the cliffs.

Instruction

Each day will generally start with setting up a top-rope anchor, and from there you will cover the required skills for the day. Instruction generally lasts until 1-2pm, though it can vary with the program weekend and the group.

Our instruction is hands-on: while an instructor or assistant may demonstrate a skill, you are going to have to do it yourself. Volunteer to help out when the opportunity arises, ask questions, and don't be afraid to make a mistake – that's a part of the learning process.

You will also be doing some climbing – and falling – during the program. Don't worry about what grade you're climbing, just have fun! Climbing outside is different and, in some ways, harder than climbing in the gym.

Afterwards

The rest of the afternoon is structured informally. We will have top-ropes setup until around 4:30pm for you to climb and practice belaying. You should work on the Program Requirements during this time. Students who are looking to do Trad Follows should stay in the M Wall area as this is where Trad Leaders will be recruiting. You can also practice skills such as top-rope anchor building.

This period of the day is great for getting to know the instructors, assistants, and your fellow students better. Feel free to come in during the afternoons of days that you are not receiving formal instruction.

Quincy Quarries

Boston area climbers have been climbing at the Quincy Quarries at least since 1927. This is where America's large scale granite quarrying industry was born in 1825 to provide the stone for the Bunker Hill Monument in Charlestown. During the next 140 years, over 50 quarries operated in Quincy, which became known nationwide as "The Granite City". The Granite Railway, one of the first railroads in the United States, was established in here 1826 to transport granite from the quarries.

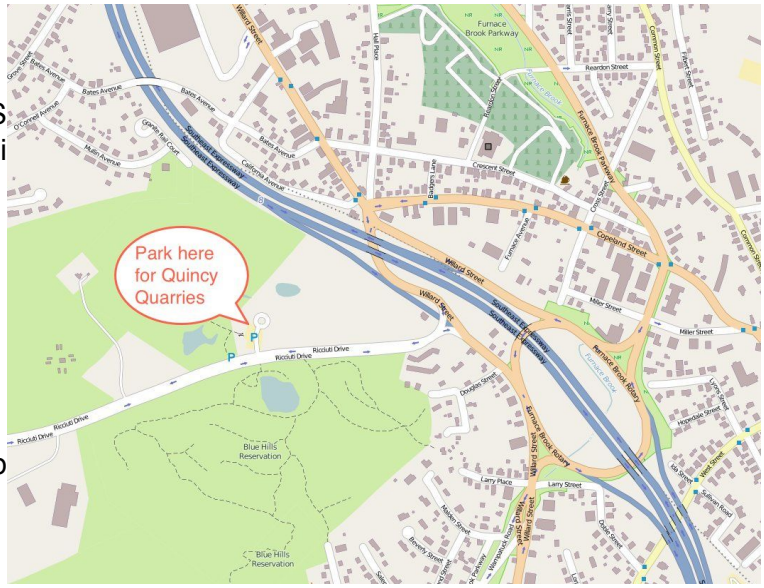
The last active quarry closed in 1963, and in 1985 the Metropolitan District Commission (now DCR) purchased 22 acres to establish the Quincy Quarries Reservation. Until relatively recently, the quarries were filled with water. Some old photos show climbers starting from boats, and jumping off the cliffs into the water was a popular (and dangerous) activity! By 2001, the quarries were filled with soil from the Big Dig, and easy access to several walls spurred new route development.

For more on climbing in the quarries see the article by Nancy Savickas in The Crux, AMC Boston Mountaineering Committee's newsletter:
http://www.amcbostonclimbers.com/the-crux-1/2018/1/4/tales-from-the-crypt-by-nancy-savcikas

Directions

From Boston: take I-93 South to Exit 8 (Furnace Brook Parkway); make a right hand turn at a UPS Store onto Ricciuti Drive. The parking lot is 0.2 mi ahead on the right.

From I-93 North: take Exit 8 (Furnace Brook parkway). Follow the sign for "I-93/Rt-3 North, Quarry Hills, Willard St." It will look like you're getting back on to I-93 North, but at the last minute, you can stay right for Quarry Hills / Willard St. Proceed to the stop sign, turn left to go under I-93, then make the first right at the stop sign (at a UPS Store) on to Ricciuti Drive. The parking lot is 0.2 mi ahead on the right.



Belay & Anchors Weekend

Overview

Belaying and building anchors are the two most fundamental skills in rock climbing. We will start each day by building a top-rope anchor. This will take a while the first day as we discuss the principles behind top-rope anchors; we will reinforce these principles for the rest of the program.

On Saturday, we will cover multiple methods of top-rope belaying. In order to practice belaying, other students will climb and take a fall for the belayer to catch. (Note: all belays will be backed up to ensure the climber's safety.) Also, taking a fall will enable you to develop trust in the system: that you can take a fall without getting hurt.

On Sunday, we will introduce trad climbing: the process for climbing a pitch and the different types of gear. However, the most important topic of the day will be lead belaying.

Textbook

In preparation for this weekend, please read the chapters listed below in the textbook. We've left notes under each chapter to guide you on what to pay extra attention to and what you can gloss over:

- **Chapter 9: Basic Safety System Introduction (pp 150-171)**
    - **Ropes (pp 150-154):** It's important to know the difference between Dynamic and Static rope. We expect you to heed the guidance under "Preventing Damage to the Rope" (pp 152). You'll also be Coiling lots of ropes (pp 153-154).
    - **Knots (pp 154-162):** Get a passing familiarity with all of the knots in this section but focus on learning and practicing the knots you will need for this weekend (listed below). You can come back to this section as a reference for the knots that you will have to learn for other program weekends.
    - **Helmets (pp 163-164):** Look at Fig 9-28 and try your helmet on at home to see if it's properly adjusted.
    - **Harnesses (pp 164-167):** Focus on the "Manufactured Seat Harness" (pp 165). It's good to know that the rest exist but we won't be using them. We will be using "Personal Anchors" (pp 166).
- **Chapter 10: Belaying (pp 172-201)**
    - **How Belays Are Used in Climbing (pp 172-174):** You will be using the "slingshot top-rope belay" most often throughout the program but learning to "lead belay" is a core part of the course. We will also demonstrate "Belaying a follower" which is important to understand because you will be the follower.
    - **Applying Braking Force to the Rope (pp 177-185):** We primarily belay with tubular belay devices but you will use the occasional münter hitch and practice a hip belay; you are not expected to know how to rig and use auto-locking or assisted belay devices but it's good to know what they are and how they work.
    - **Anchors (pp 185-192):** The anchor systems shown in this section are the type you will encounter on sport and trad climbs with fixed bolts for protection. You should be familiar with them, how they work, and what to do when your leader sets one up for you but you are not expected to be able to build them yourself. You will be building slingshot top-ropes that use "SERENE" (box on pp 191) and

the rest of the anchor building principles covered in this section but mostly with natural anchors set back from the cliff edge rather than bolts on its face. Chapter 13 (see below) goes deeper into how to build anchors.
    - **Communication (pp 197-199):** Communication is critical for safe climbing, memorize the commands in Table 10-1.
    - **Escaping the Belay (pp 199-201):** We do not teach or expect you to know how to do this but it is a good emergency skill to learn and practice.
- **Chapter 13: Rock Protection (pp 252-266)**
    - **Natural Protection (pp 252-255):** This is how you will be setting up most of your top-rope anchors at the Quarries, learn it well.
    - **Fixed Protection (pp 255-257):** You'll run across some Bolts at the Quarries that you can use along with a few elusive Pitons and lots of other weird metal stuff that we can lump under "Other Fixed Pieces".
    - **Removable Protection (pp 257-266):** You're not here to learn how to safely place this gear, just get a handle on the different types of pieces, what they're used for, and how to remove them.
- **"Belaying for Lead Climbing"** on p. 38 of this handbook

Online

The following videos may help gain an understanding of the techniques required for this weekend:

Belay & Anchors Saturday:

- How to Belay: https://www.youtube.com/watch?v=CFIz4cBFVro
- Backup Belay: https://www.youtube.com/watch?v=Uuv1B-C1Ziw
- Belaying from the top with a münter hitch: https://www.youtube.com/watch?v=FMtt0K4P5D8
- Coiling a rope: https://www.youtube.com/watch?v=jPbAn7Fr5c0

Belay & Anchors Sunday:

- How to lead belay: https://www.youtube.com/watch?v=S_F1MfVGOzk
- Cleaning a trad route: https://www.youtube.com/watch?v=H0AlsKK2HV8

Knots

In preparation for this weekend, please learn and practice the following knots:

Rewoven Figure-8	Figure-8 on a Bight	Double Fisherman's Bend
Fisherman's Backup	Girth Hitch	Autoblock
Bowline	Clove Hitch	Barrel Knot
Water Knot	Münter Hitch	

Logistics

- On both days of this weekend, you will be in a small instructional group. Different groups will be formed each day, and we encourage you to go with different instructors.

- For this weekend only, we will have “new belayer” groups. Let the weekend leader know if you want to be in a new belayer group when you arrive.

Notes

This is a packed weekend, but be sure to ask questions!

At this point, we assume you are still learning the skills, but you need to become solid on belaying technique, building a top-rope anchor, and knowing the knots in the following weeks.

Rappel Weekend

Overview

Rappelling is a technique used by climbers to descend a rope in a controlled and safe manner. In top-rope climbing rappelling is usually not necessary. Many trad climbs have a walk-off from the top, but on many other climbs you will need to rappel. There are other situations where you may need to rappel: bad weather, approaching darkness, inability to complete a climb due to difficulty, and injury/rescue situations.

We will cover how to set up a rappel, a variety of techniques for rappelling, and the relevant knots. You will do several rappels during the course of the day. At the free rappel station, you will do a rappel where you have no contact with the rock for at least part of the rappel.

Textbook

In preparation for this weekend, please read **Chapter 11: Rappelling (pp 202-222)** in the textbook. The following notes guide you on what to pay extra attention to and what you can gloss over:

- **Rappel Method (pp 211-215):** You will be rappelling using “Mechanical Rappel Systems” (pp 211-212) with either your tubular belay device or a münter hitch on a “Rappel Extension” (pp 213-214). You do not need to know how to build a carabiner brake or use “Nonmechanical Methods” although these are good skills to practice for low angle terrain or emergencies.
- **Safety Backups (pp 218-220):** You will be using “Self-Belay with an Autoblock or Prusik” (pp 218-219) in addition to your rappel extension and tubular belay device. We will also use the “Fireman’s Belay” (pp 219) throughout the program for safety while you learn.
- **Multiple Rappels (pp 221-222):** We will not be practicing a series of multiple rappels this weekend but it will come up on Graduation Weekend so know that it is a thing.

Online

The following videos may help gain an understanding of the techniques required for this weekend:

- Rigging a rappel: https://www.youtube.com/watch?v=07xUFZRQdng
- Throwing rappel ropes: https://www.youtube.com/watch?v=TQHDGrcdymw
- How to rappel: https://www.youtube.com/watch?v=7U6tdEevJgs

Knots

In preparation for this weekend, please learn and practice (in addition to the knots you’ve already learned) the following knots:

Flat Overhand Bend

Logistics

- You will spend most of the day in a small instructional group, learning the process of rappelling and then doing several rappels.
- At some point after you have done the rappel with an extended device and autoblock backup, you will go to the Free Rappel station (usually atop the Q wall and/or J wall) to do a rappel there.

Notes

At this point, you should be pretty confident in tying the knots from Belay & Anchors weekend.

Ascend Weekend

Overview

Ascending a rope is seldom required in practice, but it is a useful skill to know for when you need it. Situations in which you may need to ascend a rope include:

- Your rappel ropes don't reach the next anchor, so you need to go back up to try another descent.
- If you fall when climbing an overhang, you may not be able to swing back to the rock.

We will show you three different friction hitches to use for ascending and the procedure to ascend efficiently and safely. We will also make you ascend over a bulge which is the trickiest ascending situation. Finally, you will practice the transition from rappelling to ascending, the most common (but still infrequent) situation when ascending is used.

Also this weekend, we will set up a station for you to catch a simulated leader fall which we refer to as "catching the bucket."

Online

The following videos may help gain an understanding of the techniques required for this weekend:

- Ascending Systems: http://www.amcbostonclimbers.com/s/Ascending-How-To.pdf

Knots

In preparation for this weekend, please learn and practice (in addition to the knots you've already learned) the following friction hitches:

Klemheist	Bachmann

Logistics

- You will spend most of the day in a small instructional group, learning the process of ascending and then doing several ascents .
- At some point during the day, you will go to a station to "catch the bucket" twice.
    - We depend on students in the queue to haul the bucket, so the queue will not be a stationary line.
    - When you arrive at the station, ask the other students where you are in the queue, and remember whom you are behind.

Notes

At this point in the program, you should be solid on the knots from Belay & Anchors weekend and pretty confident on the knots from Rappel Weekend.

Open Climbing Day

Overview

This weekend is optional and only meets on Saturday (not Sunday).

This is a weekend for you to come climb, practice skills, and work on Program Requirements. In particular, we suggest getting the top-rope belaying and climbing requirements done before Graduation weekend. You may also have the opportunity to do the “follow a leader on a trad pitch” Program Requirement.

This weekend may also be available for makeup instruction for students who missed a day. We have limited ability to offer makeups, so please attend the regular weekend if possible. However you may makeup one (and only one) of the other weekends: Rappel, Ascend, or Graduation Weekend. Do not assume that make-up sessions will be happening this weekend, contact rock@amcbostonclimbers.com as soon as you know you will be missing a program weekend so we can try to make arrangements.

Logistics

- If you are doing a makeup, arrive at 8:15am. If we arrange makeup groups, they will begin at this time.
- If you are coming to climb, practice skills, or work on Program Requirements, feel free to come later in the day.

Graduation Weekend

Overview

This weekend is structured differently than the other weekends in the program. There are 5 stations that you must visit to get requirements signed off. You will also have an opportunity to complete any remaining Program Requirements.

Reading

In preparation for this weekend, please read:

- “Fixed Anchor Cleaning” on p. 47 of this handbook

Videos

The following videos may help gain an understanding of the techniques required for this weekend:

- Multi-Pitch Rappel: https://www.youtube.com/watch?v=6Xb0ajjlTis
- Anchor Cleaning (Rappel): https://www.youtube.com/watch?v=NMSTNq6SZV0
- Anchor Cleaning (Lower): https://www.youtube.com/watch?v=WzmbTHe_ql0

Knots

There are no new knots this weekend but make sure to practice everything you’ve learned so far until you can tie them correctly every time. There will be a test! These include:

Rewoven Figure-8	Figure-8 on a Bight	Double Fisherman’s Bend
Fisherman’s Backup	Girth Hitch	Barrel Knot
Bowline	Clove Hitch	Klemheist
Water Knot	Münter Hitch	Bachmann
Autoblock	Flat Overhand Bend	

Logistics

- We suggest arriving a little later (8:30am) to give us some time to set up the stations.
- The Weekend Leader can tell you where all the stations are located.
- When you have everything signed off, fill out the feedback section in the Green Book, and turn it in to a Weekend Leader.
- Practice ropes are to be returned this weekend. If you have loaner gear (helmet or harness) you can return it this weekend or next weekend at Crow Hill if you will be attending that event. You cannot use loaner gear at New Seconds weekend.

Notes

The stations on graduation weekend are a mix of testing your skills and teaching a few new skills. The stations are:

- **Knots** – You must confidently tie and explain the use of all the required knots. (See the Green Book for the list.) Usually located at the big tree at the entrance to the Quarries.
- **Top-rope Anchor Building** – You must be able to independently build a top-rope anchor and explain why it is a good anchor. Usually located atop the Q/R/S walls.
- **Fixed Anchor Cleaning** – Learn how to clean fixed anchors and go through the process. Located on O wall.
- **Multi-pitch Rappel** – You will do a two pitch rappel: setting up your first rappel, rappelling down to a ledge, pulling the rope, setting up your second rappel, and rappelling down to the ground. Usually located atop the J/K wall.
- **Double Rope Belaying** – Learn how to belay with double/half ropes.

Knots

This section covers the knots, bends, and hitches you will use during the Rock Program.

As a bit of trivia to help remember some of these names, generally: knots attach a rope to itself (e.g. forming a loop), bends attach 2 ropes together, and hitches attach a rope to something else like a carabiner. There are plenty of exceptions to these so don't get too caught up on it.

The following table lists all of the knots we include in the Rock Program and what you will be using them for during the Rock Program. Many of these knots have other uses beyond what is listed here and there are many other useful climbing knots beyond this list, this is just what is necessary to get you started in climbing.

Knot	**Some Common Uses**
Rewoven Figure 8	Tying a climbing rope into a harness.
Figure 8 on a Bight	Creating a loop in a rope for a master point or to clip to something.
Bowline	Tying the rope around a piece of natural protection such as a tree.
Flat Overhand Bend	Attaching the ends of 2 ropes for rappelling and easy retrieval.
Double Fisherman's Bend	Joining the ends of cords to make a prusik cord or the ends of ropes where getting them stuck is not a concern.
Fisherman's Backup	Using up the tail on a harness tie-in knot.
Barrel Knot	Preventing the rope from slipping through a belay or rappel device.
Girth Hitch	Attaching a sling to a harness, natural protection, or another sling.
Clove Hitch	Adjustable way to attach a climber to an anchor with climbing rope.
Münter Hitch	Used to belay or rappel when a device is not available.
Water Knot	Joining the ends of webbing.
Autoblock	Friction hitch for backing up the brake hand.
Klemheist	Friction hitch for ascending ropes.
Bachmann Hitch	Friction hitch for ascending ropes with an easy to use handle.

Rewoven Figure-8

This is the most widely used tie-in knot because it is strong, secure, and easy to visually inspect. The rewoven figure 8 should be tied through the harness tie-in points.

1. Tie a single figure-8 in the rope two to three feet from its end.
2. Pass the free end of the rope through the harness tie-in points, then retrace the original eight. Keep the loop that passes through the harness as short as possible.
3. Tightly cinch all four strands of rope exiting the knot.

Fisherman's Backup

1. Make sure you have 15-18 inches of free rope coming out of the primary knot.
2. Coil the free end twice around the standing rope, toward the primary knot.
3. Pass the free end out through both coils, and cinch the Fisherman's knot snugly against the primary tie-in knot.

The remaining tail should be around 3 inches long.

On Other "Finishes"

You may encounter climbers using other methods besides a Fisherman's Backup to "finish" the rewoven Figure-8, a common one being the "Yosemite Finish".

As always "there's more than one way to do it" but we do not teach these during Rock Program to avoid unnecessarily bombarding you with more knots than we already do. Climbing gyms will almost always require a Fisherman's Backup so that's what we teach.

The real goal is to leave an adequate amount of tail on the Figure-8 and then put that tail somewhere so it's not flapping around in the breeze.

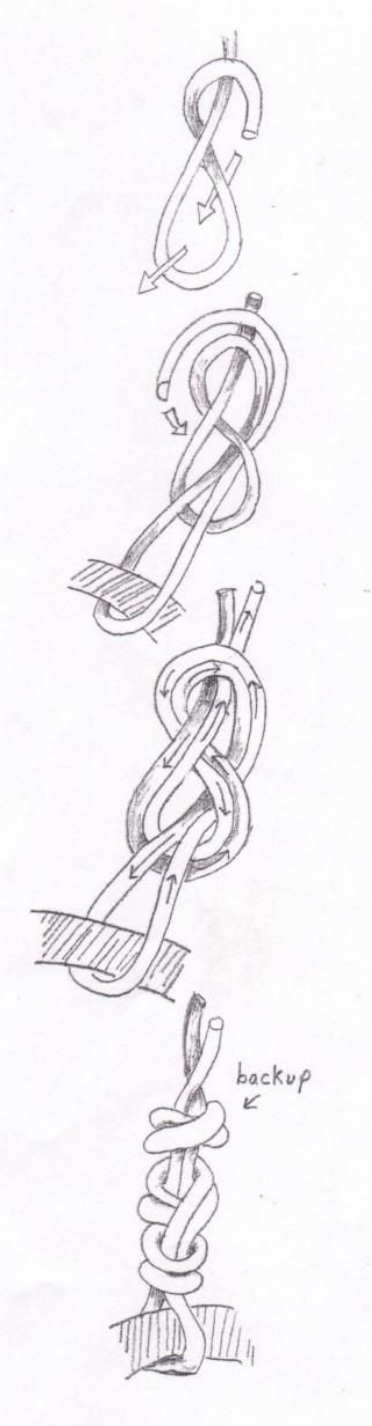
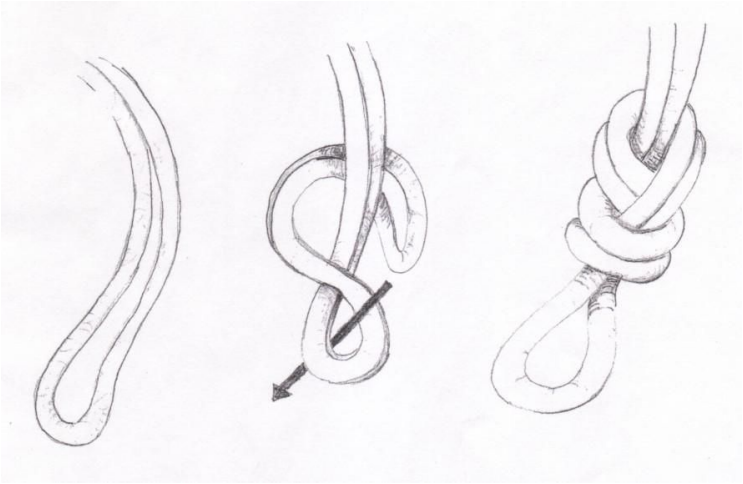


Figure 8 on a Bight

An all-purpose knot frequently used in building top-rope anchors. This may seem like a much faster way to tie a rewoven figure-8 (and it is!) but it's impossible to get the knot around your harness using this method so you're stuck doing the long way when you want to tie in.

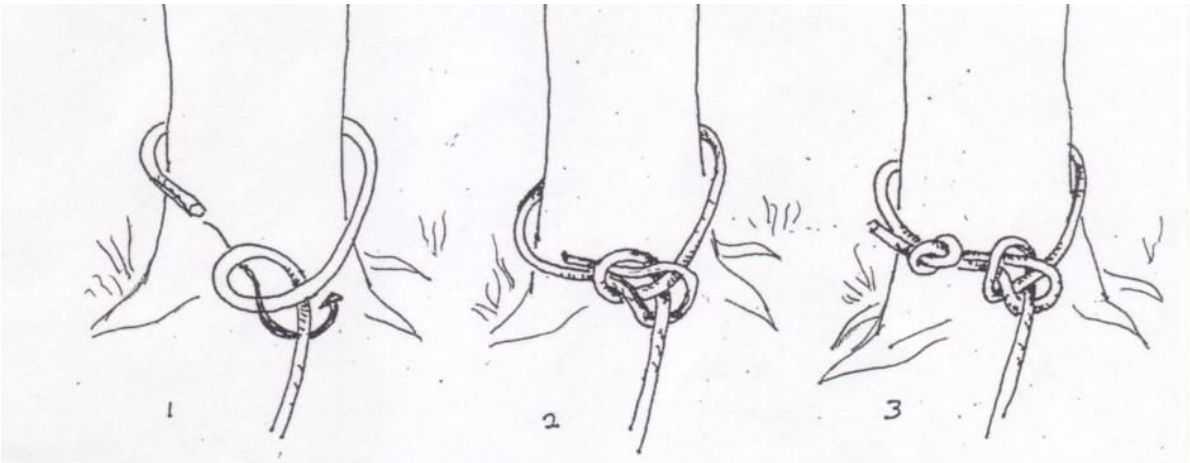


1. Make a loop in the rope.
2. Twist the loop around both strands.
3. Pass the loop through the loop that you created by twisting around the strands.
4. Pull the loop and strands to make it tight.

Bowline

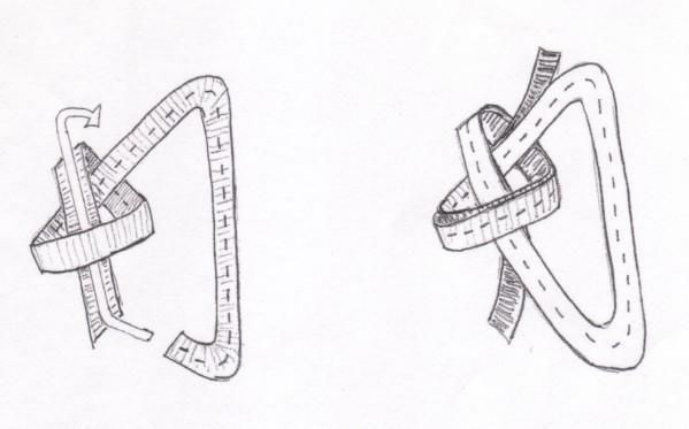
A good knot to anchor your rope to a tree or other features. Ideally you should pass the free end of the rope around the tree twice before tying the knot (not illustrated for simplicity). This prevents the rope from sawing into the tree when it is loaded.

1. Pass the free end around the tree. Twist a coil into the rope, with the free end coming out on top and the loop facing the free end.
2. Pass the free end up through the coil, down around the standing end of rope and then back down through the coil. (a rabbit comes out of its hole runs around the tree and back down its hole.)
3. Tie a Fisherman's Backup knot on the loop around the anchor. Be sure to tie this knot as shown in the illustration.



Water Knot (Ring Bend)

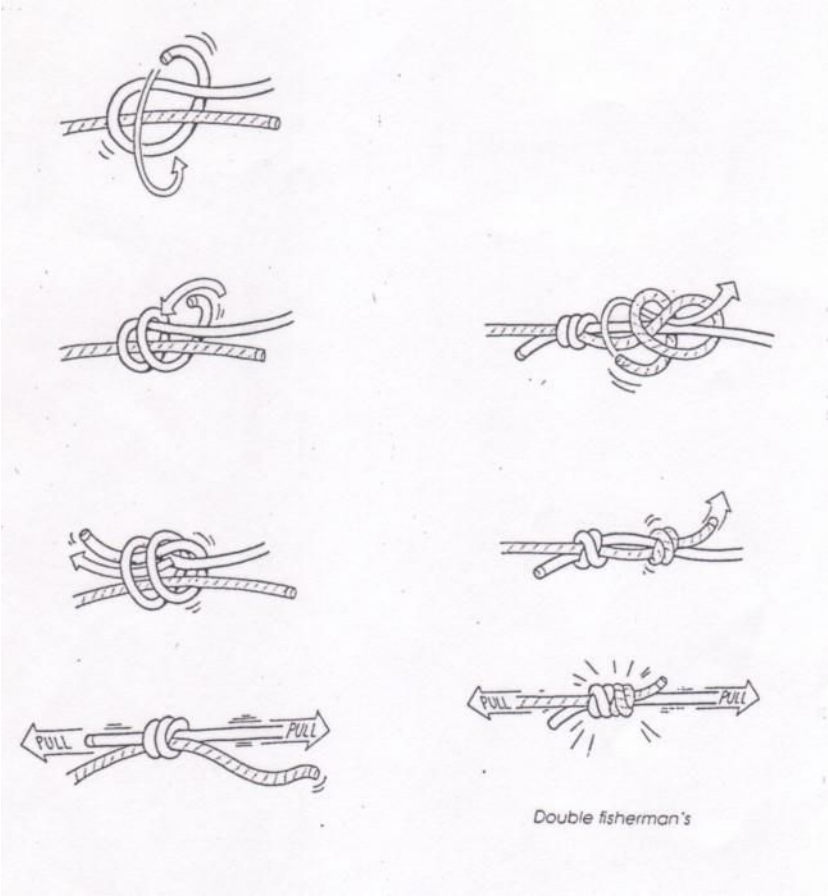
Climbers most commonly use the water knot for tying webbing into loops. Keep the tails at least 3 inches long and inspect the knot before each use. “Set” the knot by loading the sling with body weight. Some people “fix” the tails by taping or lightly sewing them so the knot cannot creep.



1. Tie a single overhand knot in one end of the webbing.
2. Match the other end of the webbing to the first end and retrace the original overhand knot.
3. Both tails should exit from different sides of the knot, and should be about 3 inches long.

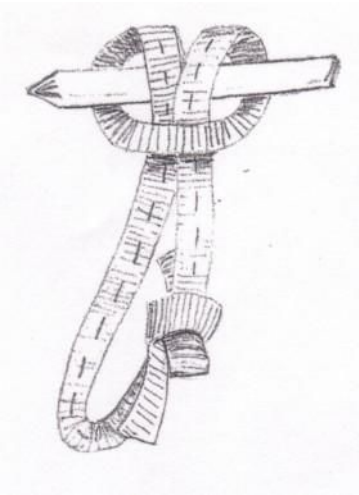
Double Fisherman’s Bend

The Double Fisherman’s is often used to make a loop out of a piece of cord to make a prusik loop or an anchor cordelette.



1. Coil the free end of one rope twice around the second rope, and pass if back through the inside of the coils.
2. Repeat the above procedure, this time coiling the second rope around the first, but in the opposite direction so the finished knots are parallel to each other.
3. Pull on all four ends coming out of the knots to cinch them snugly against each other. The remaining tails should be about three inches long.

Girth Hitch



The girth hitch works well for tying off trees and chock stones. When slinging chock stones with a girth hitch, be sure that the hitch is near the outside of the chock stone. This limits the load on the chock stone and is less likely to rotate the chock stone out of the crack. The girth hitch is also good for attaching a sling to your harness for clipping into anchors, and for connecting slings together.

1. Pass a loop of sling around another sling, tree, chock stone or other fixed object.
2. Pull the sling through itself, fastening it to the object you passed it around.

Clove Hitch

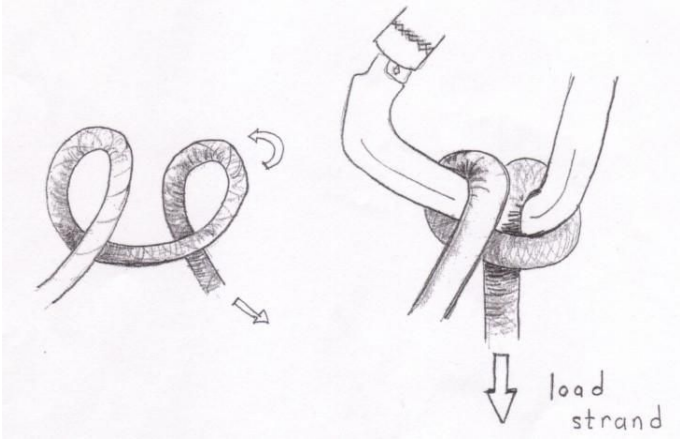
The clove hitch is often used for attaching a climber's rope to a carabiner on an anchor. It provides quick adjustment, and uses a small amount or rope, but has a tendency to loosen when not loaded. Be sure it is kept tight at the bottom of the carabiner, away from the gate. The reliability of a clove hitch can be improved by using a locking carabiner. The LOAD strand of the clove hitch should be situated near the spine of the carabiner. Once you've mastered this knot you should learn to tie it on a carabiner one-handed, this skill is useful when you've just arrived at an anchor and need to use your other hand to keep from falling off the rock.

1. Twist two coils of rope into the rope, then pass the second coil in front of the first.
2. Clip both coils into a carabiner, with the load strand situated near the spine of the carabiner.
3. Cinch the clove hitch tight.

Münter Hitch

The münter hitch can be tied on a carabiner and used in-lieu of a belay device for both belaying and rappelling. This could save your bacon if you ever drop your belay device on a multi-pitch climb.

It is a close relative of the clove hitch so always check to make sure you didn't accidentally tie a münter when you were trying to tie a clove, especially when tying a one-handed clove hitch on an anchor; the münter will not hold your weight (or much of anything) without a hand on the brake strand.

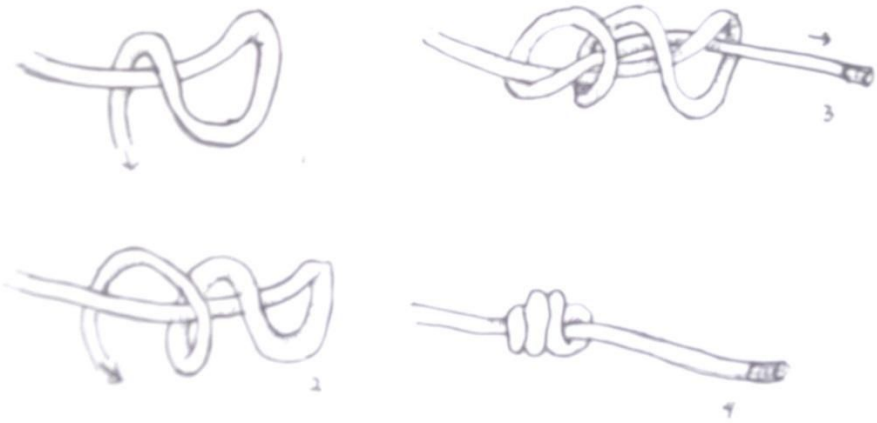


Make sure the Münter hitch is oriented with the load strand next to the spine of the carabiner.

1. Twist two coils into the rope as shown.
2. Fold the second coil back toward the first.
3. Clip a locking carabiner into both coils. Lock the carabiner.

Barrel Knot

A good knot for the ends of the rope when rappelling or belaying a single pitch lead climb to keep the rope from passing through the belay device if you've gone too far.



1. Coil the free end of the rope around itself twice, working back up the standing end.
2. Pass the free end of the rope through the coils you've created, parallel to the standing end.

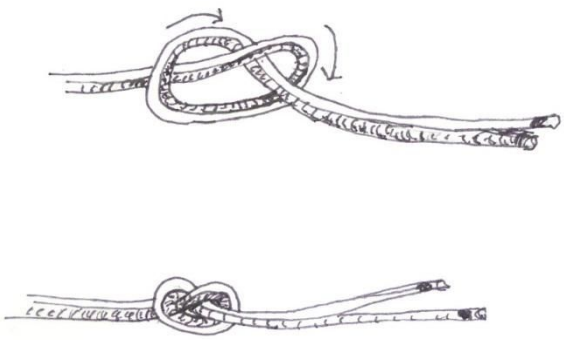
Flat Overhand Bend

The flat overhand bend is the preferred knot for joining two ropes together for rappelling. While it has a similar purpose to a double fisherman's knot, the flat overhand bend has one "flat" side that makes it easier to pull past obstacles when retrieving the rope after a rappel.

The Flat Overhand Bend is very sensitive to errors, always verify that:

- Both tails are at least 12 inches.
- It is well dressed.
- It is very tight before it is loaded.

Never use a Flat Figure-8 Bend in place of the Flat Overhand Bend. We do not teach the Flat Figure-8 Bend but it is possible for a climber accustomed to tying Figure 8's to accidentally tie one as it just requires one additional wrap beyond a Flat Overhand Bend. The Flat Figure-8 Bend is known to "capsize" (come undone) when used for rappelling regardless of the tails length and tightness.



1. Put the strands of both ropes to be joined parallel to each other.
2. Tie an overhand knot with both strands simultaneously.
3. Tighten the knot in 4 ways:
    a. Pull both ends of one strand
    b. Pull both ends of the other strand
    c. Pull the free end of one strand and the standing end of the other strand.
    d. Pull the remaining free and standing ends that you haven't yet pulled together.

Friction Hitches

Friction Hitches are based on wrapping a smaller piece of cord or webbing around a larger rope. They can be used to create a sort of ratchet as they move relatively easily when they are not loaded but clamp tight when loaded. This makes them useful as a backup when rappelling and for ascending a rope without the aid of mechanical ascenders.

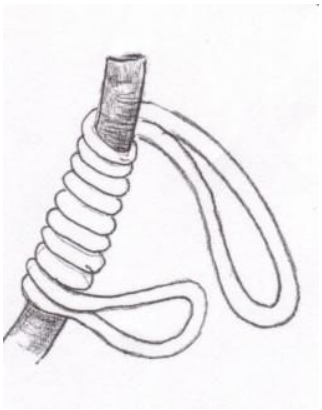
How much weight they can hold and how easy they are to move after they've been loaded are a function of which hitch you are using, how many wraps it has, whether you are using cord or webbing (for the hitches that can be tied with webbing), and the width of the webbing or the difference in diameter between the cord being used to tie the hitch and the rope it is being tied around (the larger the difference in diameter the more grip it will have). Dyneema slings are very "slippery" and may require lots of wraps or may not want to grip at all.

All of this means that there is no universally correct amount of wraps and there is no universally correct hitch for a given application. Regardless of what you're doing, make sure that the cord you are using is strong enough for the load you plan to put on it.

We refer to the loops of cord used to tie any of the friction hitches as "Prusik Loops". They are usually made from 5mm or 6mm cord 48" in length.

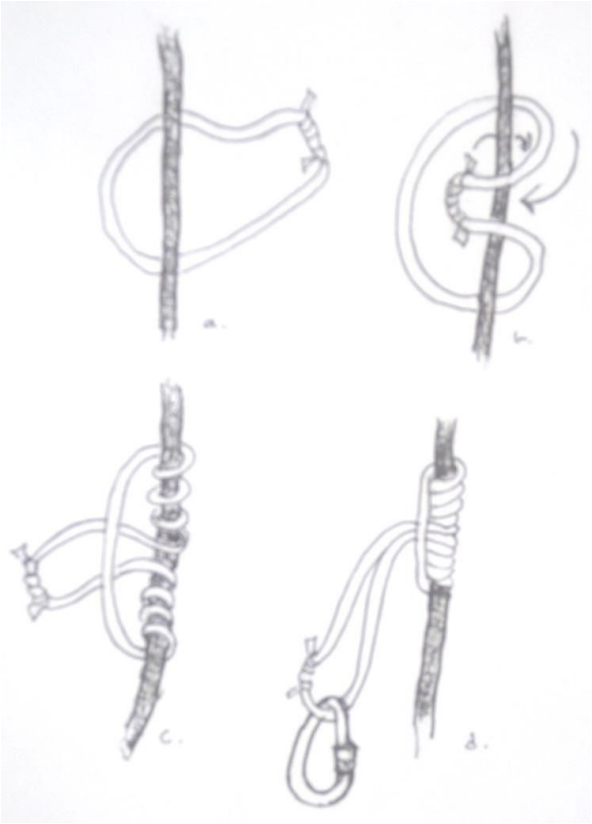
Autoblock

The Autoblock is the simplest of the Friction Hitches, often used as a rappel backup. It can theoretically be loaded in either direction relative to the host rope but in practice one loop will usually be much longer than the other which makes this more appropriate when the pull will only be in one direction. It is very easy to loosen after it has been weighted.



1. If there is a knot or stitch in the cord, webbing, or sling (e.g. the Double Fisherman's or Water Knot you used to create a loop) make sure the knot is positioned so it will not end up in the wraps.
2. Wrap a loop of the cord, webbing, or sling 4 or 5 times around the rope as needed to prevent slippage.
3. Clip both ends of the cord, webbing, or sling to a carabiner.

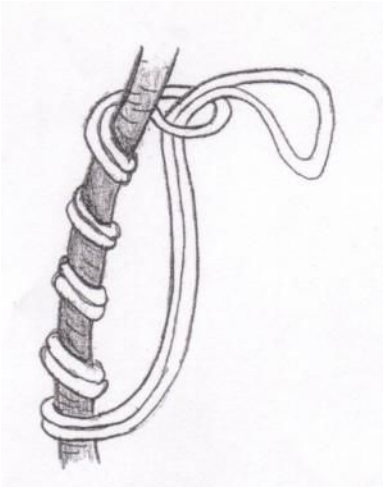
Prusik Hitch



The Prusik Hitch is the most solid of the Friction Hitches. It can be loaded in either direction relative to the host rope. The downside is that it is usually the hardest to loosen up after it has been weighted. Unlike the other friction hitches it should only be tied with cord, not webbing or a sling.

1. Put a looped piece of cord behind the rope it's being tied to.
2. If there is a knot in the cord (e.g. the Double Fisherman's you used to create a loop) make sure the knot is positioned so it will not end up in the wraps.
3. Pass one side of the loop through the other side of the loop while wrapping it around the rope in the middle.
4. Wind the cord around the rope at least three times, more if it's slipping.
5. Sort the winds so they do not overlap and tighten the knot evenly.
6. Attach a carabiner to the loose loop.

Klemheist

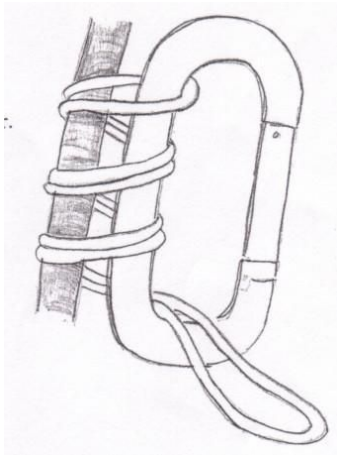


The Klemheist is between the Prusik and Autoblock as far as ease of tying it and loosening it after it has been weighted. It can only be weighted in one direction: both loops should be at the "top" of the hitch relative to the load, as shown in the illustration. It is often used for ascending a rope.

1. If there is a knot or stitch in the cord, webbing, or sling (e.g. the Double Fisherman's or Water Knot you used to create a loop) make sure the knot is positioned so it will not end up in the wraps.
2. Wrap a loop of cord, webbing, or sling 4 or 5 times around the rope as needed to prevent slippage, working your way toward the "top".
3. Pass the other end of the loop through the loop at the "top".
4. Clip a carabiner into the loop where it comes out of the other loop at the "top".

Bachmann

The Bachmann is very similar to a Klemheist in that it is unidirectional (as shown in the diagram) and often used for ascending ropes. It's main advantage over the Klemheist is that the carabiner provides a nice "handle" to slide the knot up the rope making it very easy to move after it has been weighted. The disadvantage is that you need an extra carabiner with a fat spine to tie it around.



1. Clip a loop of cord, webbing, or a sling into a carabiner.
2. If there is a knot or stitch in the cord, webbing, or sling (e.g. the Double Fisherman's or Water Knot you used to create a loop) make sure the knot is positioned so it will not end up in the wraps.
3. Place the spine of the carabiner against the rope with the gate hinge towards the "top".
4. Wrap several times around both the spine of the carabiner and rope working "down" along the spine.
5. Clip another carabiner into the loop where it comes out the bottom of the carabiner you wrapped the cord, webbing, or sling around, this second carabiner is the one you attach to your harness or whatever else you're trying to connect to the rope.

Flaking a Rope

Flaking a rope is done to make sure there are no tangles in it. This is usually done prior to starting a climb so the belayer doesn't have to struggle with tangles or prior to coiling a rope to make that process easier.

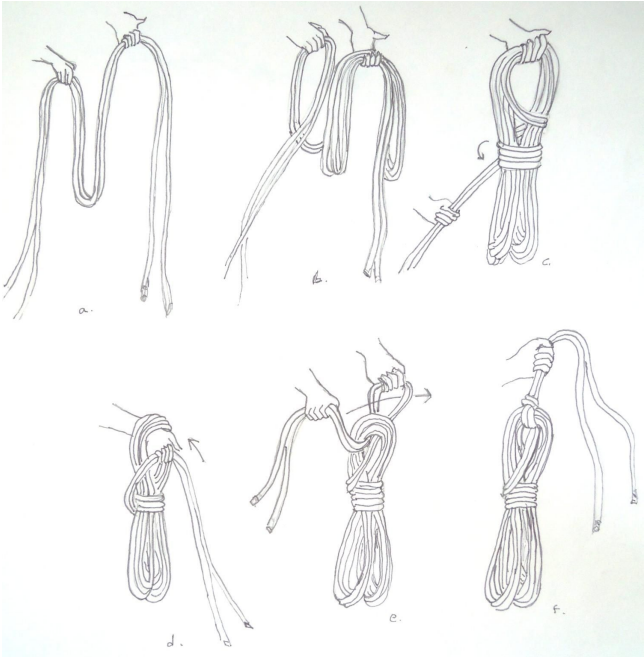
If both ends of a flaked rope are tied to something, such as gear loops on a tarp or in a bag, the flaked rope can usually be transported (with a bit of care) without becoming tangled. This is useful for quickly storing and deploying a rope when moving from climb to climb.

1. Starting at one end of the rope, place a few feet of it off to the side away from where the pile of flaked rope will end up or tie it off to a loop on a bag or tarp.
2. Work along the length of the rope tossing any un-knotted sections into a loose pile.
3. Untie any knots as you come across them.
4. Leave the other end of the rope a few feet off to the other side of the pile or tie it off to another loop.

Coiling a Rope (Butterfly)

There are a few different ways to coil climbing ropes. The AMC preferred method is the Butterfly Coil. Compared to the Mountaineers Coil, another common coiling method, the Butterfly method makes it less likely that the rope will become horribly tangled if it is undone and unceremoniously dropped on the ground (but it still makes a mess so don't do that).

The diagram shows the coil being made over a hand but for coiling a whole climbing rope it may be more comfortable to make the coil behind one's neck instead of in the palm of a hand.



The diagram also shows both strands being coiled simultaneously which makes the process quicker if the rope is being coiled for storage.

If you are planning to toss the rope (e.g. for rappell) you may want to us this technique to find the mid-point of the rope and then coil one strand at a time out from the mid-point so you end up with 2 separate coils, each comprising half the rope, ready to be tossed.

1. Place one or both free ends of the rope across one hand or behind the neck.
2. Pass the standing end(s) of the rope back across the hand or behind the neck towards the free ends creating a loop.
3. Continue passing the standing end(s) back and forth across the hand or behind the neck taking care to keep the strands together and the loops the same size until the strands run out (if you did it correctly this should be the mid-point of the rope.

If the rope was being coiled in order to toss it (e.g. for rappel) you're done, toss away. You can also tie the coil off for storage or transport (illustrated):

5. Pass the free ends around the center of the rope coil 3 or 4 times.
6. Pull a loop partway through the top of the coil.
7. Pass the free ends through the loop and pull tight.

If you leave the free ends are long enough (about 2 armspans) they can be put over the shoulders, behind the back, and tied around the waist to form a rope backpack of sorts for easy carrying.

The Trad Climbing Process

Doing a trad climb requires coordination and communication between the leader and the second. The following basic steps describes a typical process for climbing a single pitch (about one rope's length of climbing). There will be variations on this basic process based on route conditions, experience level, and the climbers' preferences. This or a similar process can be repeated to string together multiple pitches to form climbs of any length.

As you read through this you should note that there is a lot of important communication happening during the process. Note that most calls when the leader is at the top and second is at the bottom start with the name of the other person; this is important at crowded areas so that one member of a climbing party doesn't mistakenly act based on another climbing party's commands.

The leader and second may end up in a situation where they are not able to see or hear each other at all due to ledges on the cliff and background noise. This complicates the normal process of climbing calls but becomes even more critical if something is not going to plan (e.g. the belayer runs out of rope, the leader changes the plan mid-pitch, etc.). It's important to have a contingency plan in case communication is lost and, most importantly, to never take anyone off belay until you are absolutely sure they are anchored and to never take yourself off an anchor until you are absolutely sure that you are on belay. This is discussed more in the next section.

1. The rope must be flaked out so that as the leader climbs and the second belays there aren't any tangles that will interrupt the climbing. The task of flaking the rope usually falls to the second as the leader is busy with gear, the guidebook, etc.
2. The leader ties into the end of the rope on top of the pile if they aren't tied in already.
3. The second either ties into the other end of the rope on the bottom of the pile if not tied in already or, if not tying in order to let the rope un-twist, puts a stopper knot in the end of the rope to avoid losing it.
4. The leader and second should discuss what is going to happen when the leader reaches the end of the pitch: is the leader going to be lowered back down, will the leader rappel down, or will the leader belay the follower from the top of the pitch?
5. The leader and second check each other's tie-in, harness, and helmet.
6. The second puts the leader on belay after the usual belay command/response and belays the leader up the climb. The leader places gear and clips the rope into the gear. (If starting from the ground on the first pitch of a climb the second may spot the leader until the first piece of gear is placed and clipped, as the leader is effectively bouldering until that point.)
7. The leader reaches the top of the pitch.
8. If the leader wants to be lowered they will call "TAKE" and "READY TO LOWER". The second calls "LOWERING" and then lowers the leader back to the ground finishing the climb just like they are on a top-rope... as long as the rope is long enough to reach back to the ground (that's why the end is knotted or tied off to the second).
9. If the leader does not want to be lowered they will build an anchor. The second may notice that the rope is not moving for several minutes depending on what kind of anchor the leader is working with (but of course still has the leader on belay).
10. After clipping into the anchor, the leader calls "OFF BELAY."

11. The second removes the rope from the belay device and (only then) calls “BELAY OFF.”
12. If the leader wants to rappel they will pull the rope up to the midpoint, thread it through the anchors, toss it down, and then rappel back to the ground finishing the climb. The second can help the leader by confirming whether or not both ends of the rope reach the ground before the leader starts rappelling.
13. If the leader is going to belay the second from the top of the pitch (which will always be the case in a multi-pitch climb) the second gets ready to climb: tying into the rope if not already tied in, putting away the rope bag/tarp, clearing stuff from the base of the climb (in case another party comes along), etc.
14. At some point the leader will pull up the rope. It is the second’s job to keep an eye on the rope to make sure no knots or snags form.
15. When the leader has pulled up all the rope (and is probably tugging on the second), the second calls “THAT’S ME.” (If the leader rope does get stuck, or the second doesn’t say anything, the leader will ask “[second name], IS THAT YOU?”)
16. The leader puts the second on belay and calls “[second name], you are ON BELAY”. Note that it may take a bit of time before the leader gets the second on belay.
17. On a multi-pitch climb, if the second is belaying from a belay ledge between pitches, this is when the second can unclip from the anchor and clean the anchor.
18. The second ideally calls “[leader name], CLIMBING” before starting to climb (because the leader might be getting comfortable, having a snack, etc. while waiting for the second to start climbing.) The leader will reply “CLIMB ON.”
19. The second climbs and cleans gear without dropping anything and is reunited with the leader at the top of the pitch.
20. The second clips into the anchor with a clove hitch.
21. The second gives gear back to the leader and then they start the next pitch.

Belaying for Lead Climbing

Eric Engberg and Wes Huang

Belaying is the most important skill we teach in the rock program. You should practice belaying until it becomes second nature, so that you can do it well without even thinking about it.

However, just because you can belay without thinking about it doesn't mean that you should, particularly when it comes to lead belaying. top-rope belaying and lead belaying seem very similar on the surface – taking in rope versus paying out rope. However, there is a huge difference: when you are lead belaying, you are in a lead climbing situation, and there are a myriad of things you should be doing and be aware of in that situation.

The belaying for lead climbing, then, is not just about paying out rope and being ready to catch a fall. Even as a second, you should be an active and equal partner of the climbing team.

Basic lead belaying

Let's start with the basics:

Cardinal Rule of Belaying #1: Always maintain control of the belay.

This means never ever take your brake hand off the brake strand, no matter what, and keep your brake hand in the brake position whenever possible.

The second part of lead belaying is often thought of as paying out rope as the leader climbs, but really the belayer's job is to keep the right amount of rope between the leader and the belayer. This means that the belayer may need to take in rope as well as pay out rope. Sometimes, this means making constant adjustments. Here are a few examples:

- When the leader clips the rope into some protection, you let out rope, and then take in any extra slack after the protection is clipped.
- As the leader keeps climbing (after clipping protection above his or her harness), you will need to take in rope before paying it out again.

How much rope is the right amount of rope between the leader and belayer? As a general rule, there should be a slight “smile” between your belay device and the first piece of protection. We will show you what this means during the program. Realize, though, that some leaders will want a looser or tighter belay than others.

This slight “smile” in the rope is the result of what we call slack in the system. If the leader falls, any slack results in a longer fall. Now you might think that there should ideally be no slack in the system in order to minimize the distance of the fall. However, this is not practical, and if you tried to do this, you would end up violating one of the following rules of lead belaying:

Cardinal Rule of Belaying #2: Never pull the leader off the climb.

Cardinal Rule of Belaying #3: Never short-rope the leader.

Obviously, you shouldn’t pull on the rope and cause the leader to fall. However, it’s just as important to make sure you have solid footing – so that you don't lose your balance and stumble (or fall) while belaying, thereby pulling the leader off.

Short-roping the leader means not giving the leader enough slack. As a leader, there's nothing worse (aside from being pulled off a climb) than going to make a move and being abruptly stopped by the rope.

For these reasons, we want some slack in the system, but not too much – a leader does not want to take an extra-long fall!

While climbing, a leader might call “WATCH ME!” to the belayer. This means, "I'm about to do a hard move and I might fall, so be ready to catch me!" In addition to readying yourself, this usually means giving the leader a little tighter belay: taking up some slack, because the leader might fall, but also being ready to pay out rope quickly, because you know the leader is about to do a move, and you especially don't want to short-rope the leader on a hard move.

Finally, once you put a leader on belay, you must keep them on belay until you are absolutely certain that they have asked you to take them off belay. Thinking that the leader is “probably” at the top of the climb doesn't cut it. In the worst case, when the leader pulls up the rope, you will have to feed it all through your belay device, but this is much less dangerous than taking the leader off belay prematurely.

This basic level of lead belaying is basically about the mechanics of belaying, but there is much more to do in lead climbing situations and also in lead belaying.

Pre-climb communication

As the belayer, you are just as important as the leader as part of the climbing team, so you have the right (and the responsibility) to know the overall plan: what route you're going to climb, how many pitches, how you'll get down, how long it will take, what contingencies might occur, etc.

For each pitch, you should know where the leader expects the pitch to end, perhaps where he or she hopes to place gear or clip fixed gear, and, most importantly, what the plan is for when the leader finishes the pitch. On multi-pitch climbs, the leader will stay at the anchor, and put you on belay. On single-pitch climbs, the leader might instead want to be lowered or to rappel. Keep in mind that the plan may change during the pitch. No matter what the plan was at the outset, you must keep the leader on belay until you are clearly asked to take him or her off belay.

Communication during or at the end of a climb can be a problem. There are many climbs where you will not be able to see or hear the leader after some point. This may be because the climb goes over a roof or around a corner, or because there's too much wind to hear anything. If this is going to be a problem (and perhaps even if you don't think it will be), you should agree on a plan before the climb. Some climbing teams will carry radios for these situations, but you should still have a plan in case batteries die. A plan usually involves sequences of rope tugs to convey the belaying commands; there is not necessarily a standard scheme, so be sure to discuss a plan at the outset.

There are a few other things to discuss before the start of a climb. Does the leader want you to give a warning when near the end of the rope? What should you do if the leader runs out of

rope? Does the leader want you to bring anything up when you climb – water, shoes, jacket, guidebook, etc.?

Preparing to belay

At the start of every pitch, the leader and belayer should decide on a position for the belayer to belay from. There are several factors to consider:

- Safety of the belayer – Even the most cautious leader on the most solid rock occasionally breaks a hold, dislodges a rock, or drops some gear, and it often heads straight down towards the belayer. Wearing a helmet is prudent, but being in a position safe from falling objects is even better.
- Anchoring – If the start of the pitch is exposed, then the belayer should be anchored. Otherwise (e.g., at the start of most climbs or on a gigantic ledge in a multi-pitch climb), you have a choice. If the leader significantly outweighs the belayer, the belayer should probably (but not necessarily) be anchored. The advantage of being unanchored is that the belayer can move around, for example to dodge any falling rocks.
- Contingencies – Where will the belayer be pulled if the leader falls? To avoid being smashed into the rock, the belayer should generally be as close to the face as possible.
- Stance – The belayer has good footing, is comfortable, etc.
- Once you've decided on a position for the belayer, there are a few other preparations. It's conventional for the belayer to flake out the rope (or at least do something to convince the team that it will feed easily and be free of knots).

At the start of a climb, the team should decide what to do with the “dull” end of the rope. Most of the time, the prudent thing to do is to have the belayer tie in. However if the rope is especially kinked or twisted, a common strategy is for the leader to stretch it out by climbing and let the rope naturally untwist before the belayer ties in. If the belayer does not tie in, you should generally tie a knot in the end of the rope – there have been far too many accidents, particularly on single pitch sport climbs, where a leader is lowered off the end of the rope and falls to the ground.

Finally, the leader and belayer should check each other's harnesses, tie-ins, etc.

Intermediate lead belaying

The next level of lead belaying adds more things you should be doing or thinking about while you're belaying. The general theme of this level is that you should be actively considering the current situation and responding accordingly, both for your own and for the leader's safety.

At the start of a climb, the belay doesn't help until the leader clips the first protection. (Obviously, this is different for exposed starts.) Instead, you can help by spotting the leader. Your belay device should be set up to start belaying immediately, and there should be enough rope out so the leader isn't short-roped. Take a solid stance and hold your hands up at the ready. Keep your hands cupped and don't stick your thumbs out to avoid getting injured. Remember that you aren't trying to catch the leader – your objective as a spotter (depending on the situation) is to make sure the leader lands upright (on his or her feet), to direct the leader towards a good landing spot, to keep the leader's head and back from hitting anything, or to make sure the leader doesn't stumble or fall after landing.

Another thing you should do at the start of a pitch is to assist the leader with rope management. For example, if the rope is getting in the way of a foothold, move it out of the way. You may need to change your position to make this happen. You can generally assist the leader in this way until the second or third piece of protection has been clipped.

While you are belaying, you should regularly (if not constantly) ask yourself, “What would happen if the leader fell now?” If the leader would fall right on top of you, then move! On multi-pitch climbs, what happens if the leader falls before clipping the first piece of protection and falls below the anchor? If you would be pulled off a ledge, then shorten your tie-in! If you would be turned to one side, will you be able to keep your hand in the brake position? If not, change your position! Some of these issues may be mitigated if the leader clips part of the anchor as the first piece of protection to provide an upward pull for the belayer. Even so, good belaying will often require you to change your position frequently, especially at the start of a pitch.

A good belayer will anticipate when the leader is going to clip a piece of protection and be ready to quickly pay out slack. Clipping can be the most dangerous moment for a leader because there is a lot of slack in the rope until the protection is clipped. Ideally the belayer should pay out just enough slack so that the leader's motion is unimpeded by the rope, allowing the clip to be made quickly. Sometimes a leader will call, “CLIPPING,” to let you know when this will happen (especially in desperate situations!) Usually, more than one arm's length of rope (what you can quickly feed through your belay device) is required to make a clip. This is another situation where changing your position can help; moving towards or away from the anchor is a way of quickly adjusting the amount of slack in the rope.

One last thing to keep in mind is that on a multi-pitch climb, another leader (e.g., from the party behind you) may arrive at your anchor while you are belaying. Depending on the climb, they may be able to build an anchor in another spot. However, on some climbs, there will be no choice but to build an anchor right where your anchor is or to share the same fixed anchor that you are using. This can also occur when the fixed anchor for your belay also serves as a rap station, and another party rappels down. Remember that your first responsibility is to belaying your leader. If another party may compromise your belay or if you’re uncomfortable with what they’re doing (vis-à-vis your belay), you should say something. Almost all climbers will be proactively reasonable about this. However, you shouldn't be unreasonable – remember, that other leader is at some risk while not anchored. In most situations, there shouldn't be any problem with another leader anchoring and perhaps even bringing up his or her second while you are still belaying your leader, so invite them up, move over a little bit, and share the spot or the fixed anchor.

End of the pitch

The leader has reached the top of the pitch, now what? First and foremost, you must keep the leader on belay until you are clearly asked to take him or her off belay. There have been many accidents because of miscommunication at this moment. Also, don't yell “Belay Off” until the rope is completely out of your belay device so that you don't drop your device when the leader starts pulling up rope.

If the leader is going to stay at the top and you are going to second the pitch, you have a few responsibilities. The first is to make sure your end of the rope doesn't escape – if you're not already tied in, do it right away. As the rope is being pulled up, watch to make sure that it's not

stuck on rocks or tree roots and that there are no knots or tangles that will get stuck at draws. At some point, you need to yell, “That's Me!” Remember, you may not feel the tug if the rope is tied into an anchor. Make sure that you will have enough slack to move around to do what you need to do before climbing. Besides putting on climbing shoes, you should tidy up a bit at the base of a climb (pack up the rope bag, put your packs off to one side, cover them if it might rain, etc.) as other people might come and start the climb before you're finished. Make sure you bring everything you're supposed to: pack, shoes, water, jacket, guidebook, etc. While all this is going on, you should also strive for efficiency – time is safety (or at least more climbing opportunity).

Once the leader tells you that you're on belay, clean the anchor and start climbing!

If you don’t clearly hear the leader tell you that you’re on belay, don't assume that you are! Just because the leader pulled up the rope and it hasn't moved for a minute doesn't mean that you're on belay – the leader may be rearranging things, adding a redirect, etc. Yell up to the leader, “Am I ON BELAY?” Hopefully you hear a response. Try a few times. Otherwise, wait for the sequence of rope tugs you agreed upon beforehand. Oops, did you forget to do that? Now you're in a difficult situation. Periodic tugs on the rope, as though the leader is trying to pull up slack as you climb, probably mean that you're on belay. However, as a new second, just sit tight and let the leader re-establish communication (e.g., by downclimbing). Once you're more experienced, you might clean the anchor and start to climb anyway, but this is risky because you might not be on belay. If the rope gets pulled up as you climb, that's a good sign; if not stay put until it does.

When the leader reaches the top of a single pitch climb, another possibility is that the leader will come down. This is common in sport climbing but can happen on trad climbs too. Usually this means that you will lower the leader, but it's possible that the leader will rappel. (The leader may clean the pitch on the way down.) If you are lowering the leader, there is no reason to take the leader off the belay. The leader will probably ask for some slack in order to set up for being lowered. If there is any possibility of not having enough rope, you should have tied a knot in the end to prevent the leader from accidentally being lowered off the end of the rope. If the leader is rappelling, you should let the leader know when both ends reach the ground (or not).

Advanced lead belaying

We don't expect students in the rock program to have the skills we describe here under the “advanced” level; these require extensive experience with lead belaying and experience being a lead climber. Nevertheless, we describe them here for your future reference.

At the “advanced” level of lead belaying, you become a second set of eyes for the leader. You may have a better perspective on the climb from your position and from the fact that you aren't leading. You should watch how the rope is running below the leader and alert the leader, for example, if it needs to be flipped around some obstacle. Does the leader need to extend a sling to reduce rope drag? Warn the leader if the rope runs behind his or her leg. Watch for back-clipping and z-clipping. Consider letting the leader know if some gear the leader placed falls out.

In the basic level of lead belaying, the belayer's objective was to be sure to catch a lead fall and to manage slack to keep the fall as short as possible (without short-roping the leader or pulling

the leader off the climb). At the advanced level, the objective is to stop the fall appropriately. The appropriate way to stop a fall can be very context specific with a lot of different possibilities.

Usually a short fall is best, but there are exceptions. For overhung sport climbs, a leader falls into free space, so it doesn't matter if the leader falls a little further. The holy grail in sport climbing is to give a “soft catch” which generally involves jumping up at the right time. Also, there can be situations in both trad and sport climbing where falling a little further makes the difference between the leader slamming into rock and swinging into free space.

On the other hand, if you’re on a runout slab climb and the leader falls and starts rolling and tumbling down the slab, the appropriate response may be to jump down and run backwards to stop the fall even sooner.

In most cases, you don't have to do anything overly drastic, but you should be aware of the options. The right response may change several times during the course of a single pitch, and of course being tied in tight to an anchor will limit your options.

Climbing Movement

Wes Huang

Our program focuses on the safety systems and skills for rock climbing, but not on the physical act of climbing up a rock face. You will improve with practice, and you can ask any of our instructors or assistants for some pointers during the course.

Our textbook, Mountaineering - The Freedom of the Hills covers climbing skills in Chapter 12. The following notes outline concepts of climbing movement which is more about balance and body position.

Balance

- Balance is essential to climbing
    - Climbing is hard because you must learn to balance your body in 3 dimensions!
    - Very subtle shifts/changes can make a huge difference in your balance.
- Most of the time when climbing, we are in static equilibrium
    - Gravity pulls down, effectively at our center of mass (COM).
    - Support forces, generally from hands and feet, counteract the gravitational force.
    - This is easiest to see in a plane. It must be true in 3D, so it is true in every plane.
- Base of support – think of this as the area between the points you're standing on.
    - Balance is easy when your COM is inside the base of support
    - When your COM is outside the base of support, you need other forces to balance.
    - Those forces generally come from hands (but may also come from feet, etc.)
    - The further your COM from the base of support, the more force is required.
    - How does the base of support change as you climb?
- Your balance feels worst when your COM is at the edge of your base of support.
    - You can move your COM within your base of support.
    - You can change your base of support.
    - What are the tradeoffs between a wider and narrower base of support?
- Exercise: Think about where you ideally want each handhold or foothold.
- Exercise: Don't "power through" a move: figure out how you can do it more easily.

Hands

- There are many different terms for the different kinds of handholds.
    - Jug, sidepull, crimp, sloper, pocket, undercling, pinch, gaston
- Key questions:
    - In what directions can you pull on a given handhold?
    - How strenuous is it to exert the force you need?
- Don't forget that you can use your hands to push too!
- Straight arms versus bent arms
- Gym-climbing exercise: Glue hands – your hand sticks to a hold where it is first placed and releases only after the other hand has been moved.

Feet

- There are a few terms for different footholds: edge, smear
- Feet are usually used for standing on, but you can also use them to pull and push!
- Exercise: Silent feet – practice precision footwork by looking where you're going to place your foot, and placing it on the first try without any noise. Don't look away too soon!

Turning

- Turning is fundamentally a way of moving your center of mass (COM)
    - By turning, you put one hip against the wall.
    - This lets you have your COM closer to the wall, especially when you have to bend your knees.
    - This can provide better stability and more freedom to move your COM.
- Pivoting
    - In order to turn, you usually need to pivot your feet on a foothold from an inside edge to a backstep (outside edge).
    - Step on a foothold so there's enough room to pivot (if you will need to pivot).
- Gym-climbing exercise: Same-side-in Traverse/Climbing
    - Whenever you want to move your right hand, your right hip must be turned into the wall, and vice versa. Use any holds; don't restrict yourself to a set climb.
    - When you move a hand, both feet are on footholds.
    - You may reposition your feet as necessary in between moving hands.

Flagging

- Flagging is a useful intermediate to advanced technique.
- Flagging is when you are standing on only one foot and extend the other leg to one side (without stepping on that foot).
    - That extended foot may or may not touch the wall, depending on the situation.
- Flags can be used to keep you from barn-dooring, but in many situations flags are used to position your COM to improve your balance and to extend your reach.
- The "normal" (or "back-step") flag
    - The right leg extends out to the right side or vice versa.
    - Foot you are standing on is usually a back-step (i.e., outside edge towards wall).
    - Usually, you are using the opposite hand and foot, e.g., stand on left foot, holding with right hand; flag with right foot, reach with left hand.
- Reverse flags – the inside and outside flag
    - The right leg extends out to the left side or vice versa.
    - Usually only useful on overhanging climbs.
    - Outside flag: the extended leg is behind you
    - Inside flag: the extended leg is in front of you, between you and the rock.
    - Usually, you are using the same hand and foot, e.g., stand on left foot, holding with left hand; flag with right foot, reach with right hand.
- Gym-climbing exercise: Traverse/Climb using a flag every time you move a hand
    - You may reposition your feet as necessary in between moving hands.

Drop knee

- An intermediate to advanced technique, really just an extreme turn.
- For example: right hand on hold (sidepull), edge with right foot, backstep with left foot, (left hip turned into the wall), bend left knee, and reach with left hand.
- To avoid injury, keep your foot and knee in alignment!

Fixed Anchor Cleaning

Bob Rogers and Wes Huang

Editor's note: Do not use this article as your sole guide for cleaning fixed anchors! This article is to supplement the instruction we offer in our program. While it is detailed, there are many aspects of cleaning a fixed anchor that are hard to put into words and which we will show you during the program.

Introduction

All sport climbs and some single-pitch trad climbs will have a fixed anchor at the top. A modern fixed anchor consists of 2 bolts; the hardware attached to each bolt can vary. Usually each bolt will have a short section of chain and a quicklink at the end of the chain, but there could be just rap rings on the bolts or at the ends of the chains.

After leading the climb, the leader will build a top-rope anchor using the bolts, usually just using a quickdraw on each bolt, clip the rope into this anchor, and then be lowered to the ground by the belayer. The rest of the party will climb the route on this top-rope anchor.

The last climber in the party must “clean” the anchor, i.e. remove the top-rope anchor that the leader built, and somehow get back to the ground without leaving any personal gear. We refer to this process and transition as Fixed Anchor Cleaning.

Local Ethics and Wear & Tear on Fixed Anchors

Why not just use the fixed anchor as a top-rope anchor? The problem is that a weighted rope running through the fixed anchor wears away the anchor hardware. Dirt or sand in the rope is the main culprit, but that's a reality of climbing outdoors. Even though fixed anchors are made of steel, this wear does add up. You will see grooves in fixed anchors, particularly on popular routes. These grooves can eventually create sharp edges, which are dangerous because they can damage or cut ropes.

If every climber were lowered on the fixed anchor, that hardware would have to be replaced more frequently. Generally, a nonprofit local climbing organization takes on the stewardship of maintaining fixed anchors, and they are usually the ones to set the local ethic for a crag on how the fixed anchors should be used. This ethic is a balance between replacing fixed anchor hardware (using their limited funds) and climber safety.

There are two ways to get down from a fixed anchor:

- Rappelling – this puts the minimum wear on an anchor because the rope is not weighted when it is pulled, but it involves a more complicated transition.
- Lowering – this is a simpler and quicker transition but does put wear on the anchor.

The local ethic for most crags these days is that it is acceptable to lower once per climbing party, i.e. for the last climber. There are some crags where it is never acceptable to lower from a fixed anchor in which case the last climber must rappel. There probably aren't any crags now

where toproping through a fixed anchor is acceptable. The local ethic does vary, so check with local climbers at the crag or read the guidebook.

Communication

Here's the most important thing about cleaning fixed anchors: *Before you start climbing, talk to your belayer about what you're going to do once you get to the top.* Depending on how you're going to clean the fixed anchor, your belayer may or may not be taking you off belay. There have been far too many accidents because the climber thought she was on belay, but the belayer though he was supposed to take the climber off belay.

Lowering Transitions

The transition to lowering depends on the details of the fixed anchor. Fixed anchors will have either:

- Quickclips – essentially large steel carabiners attached to the bolt or at the end of the chains. There are other similar types of hardware, such as open cold-shuts; the key characteristic is that you can clip or drop the the rope into this hardware.
- Quicklinks, rappel rings, or chains – a quicklink or rappel ring may be attached directly to a bolt hanger or at the end of chains, but sometimes there are just chains. The rope must be threaded through this hardware.

These transitions are easiest when you have a good stance at the fixed anchor. The procedures below describe this situation first and then address what to do if the stance is poor or nonexistent.

Lowering from Quickclips

This is almost trivial, and you will stay on belay during the transition.

1. When you get to the top of the climb, tell your belayer to give you some SLACK.
2. Clip the rope into the quickclips.
3. Remove the rope from your quickdraws, and then remove your quickdraws from the anchor.
4. Tell your belayer to TAKE, and then LOWER.

This transition is fast and easy, so if you do not have a good stance at the top of the climb, you should be able to grab something (a handhold or one of the quickdraws) and hold yourself in place while you do the transition.

Lowering from Quicklinks, Rappel Rings, or Chains

There are several different ways to make this transition, but here is a basic procedure. You will stay on belay during this transition.

1. When you get to the top of the climb, tell your belayer to give you some SLACK.

2. Make a bight in the rope between the top-rope anchor and your belayer.

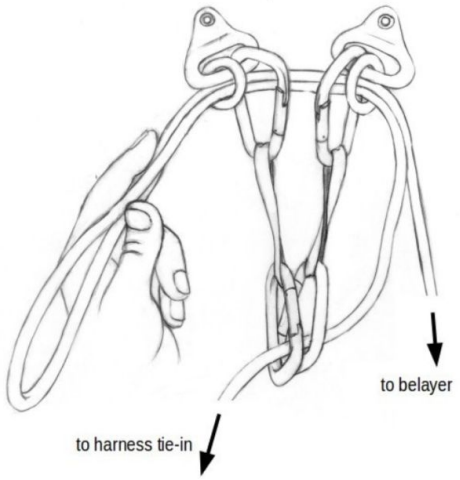


Illustration 1: Threading a loop of rope through the rap rings.

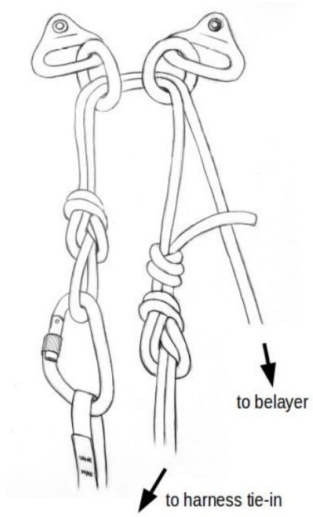


Illustration 2: After clipping the figure-8 on a bight to your belay loop.

3. Push this bight through the quicklinks, rap rings, or the bottom links of the chains. (See Illustration 1 above.)
4. Tie a figure-8 on this bight and clip it to your belay loop with a locking carabiner.
5. You are now on belay from the figure-8 on a bight through the fixed anchor, so you can remove the top-rope quickdraws from the rope and the anchor. (See Illustration 2 above.)
6. Untie your original tie-in (the rewoven figure-8) and pull that rope through the fixed anchor.
7. Tell your belayer to TAKE, and then LOWER.

There can be complications with this method:

You will use 5-10 feet of rope for this method: from the figure-8 on a bight you've clipped into your belay loop, to the end of the rope. If this will prevent you from being lowered to the ground, then:

1. Retie into the end of the rope (through your harness tie-in points with a rewoven figure-8).
2. Unclip and untie the figure-8 on a bight from your belay loop.

- If there isn't a good stance at the top of the climb, you will need to “go in direct” to the anchor, essentially hanging from the anchor, to make the transition. (See the next section on going in direct.) This can make the transition much more awkward.
- Very rarely, you will encounter chains with links too small to push a bight of rope through. You will have to handle this situation as a rappelling transition which is covered in the last section.

Going in Direct to a Fixed Anchor

“Going in direct” means attaching yourself directly to the fixed anchor. This is always necessary for a transition to rappel, and only rarely for a transition to lowering. This must be done without

using the climbing rope because you will need to reconfigure the rope for rappelling (or for lowering).

Going in direct can be error prone because there are more slings and/or quickdraws attached to you and the rope, and it is easy to get confused and unclip in the wrong order. You should at all times be connected to both anchor points (the two bolts), either via the top-rope anchor, the direct connection, or the rappel rope. This is a transition that you do alone, without a partner to check you, so make sure you double check your new system before you disconnect the old system: check that everything is configured correctly, that locking carabiners are locked, etc.

If you have a good stance at the top of the climb, going in direct is fairly easy:

1. Girth-hitch a sling to your harness tie-in points.
2. Attach the sling to both bolts with locking carabiners.

If it is awkward to use the bolts for any reason, then it's fine to clip a link or two down the chains, just as long as you leave the bottom points of the anchor free for the rope.

If you don't have a good stance at the top of the climb, going in direct is more complicated because you will need to put at least part of your weight on the anchor. Here is a basic procedure:

1. Girth-hitch a sling to your harness tie-in points, and attach the sling to one bolt with a locking carabiner.
2. Put a second quickdraw on the other bolt and connect it to your belay loop. (Do not use the top-rope anchor quickdraw that is already on that bolt; otherwise you will be disconnected from that bolt!)
3. Put your weight on the quickdraw connected to your belay loop.

Always double check your new connections to the anchor before proceeding!

Rappelling Transition

Rapping from a fixed anchor requires you to transition twice: from the rope to a direct anchor connection and then, after setting up the rappel, back to the rope.

1. Go in direct to the fixed anchor (see the previous section), and tell your belayer to take you OFF BELAY.
2. Dismantle the top-rope anchor and clean the gear from the fixed anchor. (Obviously not any gear you are using for your direct connection to the anchor!)
3. Pull up a bight of rope and feed it through the quicklinks, rap rings, or bottom links of the chains. Tie a figure-8 on the bight and clip it to your harness with a carabiner; this is a “keeper knot” to keep you from dropping the rope – it's very embarrassing to be stranded at the top of a climb without a rope!
4. Untie your original tie-in (the rewoven figure-8) and pull the end through the fixed anchor.
5. You must now set up the rope for rappelling; it has already passed through the fixed anchor, so you just need to pull up enough rope to get both ends on the ground.

- The usual rappelling practices apply here. If your rope has an accurate middle mark, you can pull the rope through the chains until your reach the mark, then remove your tie-in and drop that end. In the worst case, you will need to pull up the whole rope to set up

your rappel (to find the middle of the rope). You can also take advantage of the fact that you have a partner on the ground who can tell you when the ends are down. In any case, don't drop the rope!

6. Set up your rappel and transfer your weight to the rope, then undo your direct connection to the anchor. Don't forget to take all your gear with you when you rappel!

Transitions for Small Chains

You may encounter chains where the links are too small to pass a bight of rope through. In this case, the transition to lowering or rappelling is a little more involved:

1. Go in direct to the fixed anchor.
2. If you are rappelling, tell your belayer to take you OFF BELAY. If you are lowering, it's best to just ask your belayer for some SLACK.
3. Pull up a bunch of slack, tie a “keeper knot,” and clip it to your harness.
4. Untie your original tie-in (the rewoven figure-8), and thread the end through the bottom links of the chains.

If you are lowering:

5. Tie into your harness through the tie-in points with a rewoven figure-8.
6. Unclip and untie the “keeper knot.”
7. Tell your belayer to TAKE.
8. Undo your direct connection to the anchor.
9. Tell your belayer to LOWER.

If you are rappelling:

5. Tie a second “keeper knot” on the end of the rope, and clip it to your harness.
6. Unclip and untie the first “keeper knot.”
7. Set up a rappel as before.

Buying Gear

One of the great joys of being a climber is buying gear. Here's some pointers to get you started.

Where to buy gear

You have many choices when it comes to buying climbing gear:

- Local stores: REI has stores in the Boston area; EMS has a store in Marlborough and stores in New Hampshire. Both companies have a reasonable selection of climbing gear.
- Other stores: you may find yourself near one of the following stores which generally have a better and wider selection of gear than REI and EMS
    - Rock and Snow, New Paltz, NY
    - International Mountain Equipment (IME), North Conway, NH
    - Ragged Mountain Equipment, Intervale (near North Conway), NH
    - Outdoor Gear Exchange, Burlington, VT
    - Alpenglow Gear, Bar Harbor, ME
    - Cadillac Mountain Sports, Bar Harbor, ME
- Online stores: There are many reputable websites that sell climbing gear. Most offer free shipping for orders over a certain amount.
- Other online resources:
    - Use a search engine such as Google Product search to find the best deals for a specific item.
    - Steep & Cheap is a website that sometimes has good deals on gear that you want. There are websites that will send you alerts on Steep and Cheap deals.

You don't have to pay full price:

- If you are patient, you can buy almost anything at 20% or more off list price.
- REI offers coupons for 20% off one item to members a few times a year. Lifetime membership at REI costs $20; you are then eligible for a member rebate/dividend (usually 10%) on full-price purchases.
- EMS has some sales ("club days" for members of an outdoor club, and "upgrade your gear sales") a few times a year. Students can get 15% off at EMS stores any time.
- Most online retailers will have a sale at least a few times a year (during the usual holidays). You can sign up for their email list to get notifications.

What gear to buy

The rest of this section has specific advice on buying gear. In general, there are three things that you will want to balance:

- Cost
- Weight – all those grams add up, particularly after you've been carrying your gear all day
- Personal preference – is the harness comfortable? do you like only full sized carabiners? etc.

Essentially all gear from major brands is UIAA/CE certified to meet minimum standards, so safety is not an issue when buying new gear. Note that “major brands” doesn’t just mean Black Diamond and Petzl, but also includes Mammut, Wild Country, Mad Rock, Trango, Metolius, CAMP, and so on.

The following advice focuses on gear that you need to go toproping and sport climbing. Trad gear is beyond the scope of this booklet, but it is usually not hard to find a “gearhead” who is happy to talk about gear.

The Basics

Harness – usually comes in S, M, L according to waist size. There are a number of women-specific harnesses available. Also see “Manufactured Seat Harnesses” in Freedom of the Hills on page 165.

- Comfort is key. It’s best if you can try on the harness and hang on it, though not many local stores are currently setup to do this.
- Features to consider: standard buckles versus speed buckles, whether leg loops are adjustable (useful for ice climbing), how many and type of gear loops.
- If you think you might try ice climbing, get a harness with slots for ice clippers, and make sure that the harness is large enough to fit over your winter clothing (i.e., pants, jacket, and underlying layers).

Climbing shoes – There are a variety of brands and styles, some sold in US sizes, others in European sizes. Sizing can vary a lot from brand to brand. Also see “Footwear” in Freedom of the Hills on pages 225-226.

- Comfort is key. For a first pair of shoes, get something that you can wear all day. They shouldn’t be too tight, but also shouldn’t be too loose.
- Leather shoes will stretch a bit (sometimes by a half US size)
- Try on several pairs at a local store. Buy them from your local store so they’ll continue to stock a selection of rock climbing shoes!

Helmet – Get a climbing/mountaineering-specific helmet. Make sure it fits your head and is comfortable to wear. The chin strap should be tightened so that the helmet does not shift, exposing part of your head. Most climbing helmets have features to attach a headlamp over the helmet. Try some on at a local store, and buy from your local store so they’ll continue to stock a selection of helmets! Also see “Helmets” in Freedom of the Hills on pages 163-164.

Chalk bag – There are a few different styles and a lot of different patterns/designs. You may want a chalk bag with a zippered pocket to hold your keys while climbing. Many (most?) climbers use a chalk sock to hold the chalk in their chalk bag.

Belay/rappel device – Also see “Types of Belay Devices” in Freedom of the Hills on pages 179-181.

- A plain ATC device, such as the Black Diamond ATC, is fine for toproping, sport climbing, and seconding trad climbs.
- You may want an ATC device that has a high-friction side, such as the Black Diamond ATC-XP or the Mammut Vader.

- If you think you will eventually lead trad climbs, you should consider getting a belay/rappel device that can be set up in an autolocking (or “guide”) mode, for example the DMM Pivot, the Petzl Reverso or the Black Diamond ATC-Guide.

Carabiners – Also see “Carabiners” in Freedom of the Hills on pages 168-171.

There are different carabiners for different purposes:

- Belaying/rapelling – typically a HMS or pear-shaped carabiner which is larger and has a round (as opposed to I-beam) profile.
- General locking carabiners – for connecting yourself to an anchor, can be smaller (but still large enough to take a clove hitch) and therefore lighter.
- General non-locking carabiners – for clipping stuff (shoes, water bottle, etc.) to your harness.
- Carabiners for draws and quickdraws – generally a straight-gate or sometimes wire-gate carabiner for the pro side, and a bent-gate or wire-gate for the rope side.
- Racking carabiners – for clipping gear to your harness or gear sling

Characteristics of carabiners:

- Gate – straight gates are traditional; bent gates are for the rope side of draws only and allow for easier clipping; wire gates are lightweight (and minimize gate flutter) but usually require a notch-nose.
- Nose:
    - Notch-nose – for wire-gate or inexpensive straight/bent-gate carabiners. The nose can snag on gear loops or gear slings which is annoying, but some people value the low weight of wire-gate carabiners.
    - Keylock – a snag-free nose design
    - Clean wire – a nose design for wire-gate carabiners that doesn’t snag, found on the Wild Country Helium and Black Diamond Hoodwire. The Petzl Ange carabiner has a unique snag-free gate/nose design.
- Shape:
    - D-shaped are perhaps most common
    - Pear-shaped or HMS carabiners are generally used for belay/rappel
    - Oval carabiners can be handy for racking gear and for top-rope anchors.
- Size – some carabiners are “full size” while others are smaller. Small carabiners are generally lighter, but you may or may not like the feel of smaller carabiners, depending on what you are using it for.
- Gate opening – a larger gate opening makes it easier to get a rope in/out.

For locking carabiners, you have the choice between screw-gate and autolocking. While autolocking carabiners have the advantage of locking automatically, this can be annoying when you have to clip several things (especially one-handed). Some people advise against getting autolocking carabiners so you get in the habit of locking and checking your locking carabiners.

Beyond the basics

Rappel Brake Hand Backup – take 3-4 feet of 5-7 mm nylon accessory cord and tie a loop with a double fisherman’s bend. The exact length you need depends on the diameter of the cord that

you use, how many wraps you use in your friction knot, and where you attach the backup to your harness.

Slings – you will need a few single (24 inch / 60 cm) and double (48 inch / 120 cm) nylon slings that are 9/16-11/16 inch or 15-18 mm wide. You will use these slings for tying into an anchor, holding gear that you clean, possibly ascending, etc.

- For general purpose slings, we recommend nylon instead of high-tensile webbing (e.g., spectra, dyneema, etc.) Your slings/webbing should be rated to at least 10 kN or 2250 lb.
- Many people prefer sewn slings, but you can tie your own nylon slings: use 5' of webbing for a single, 9' for a double. Also see "Runners" in Freedom of the Hills on pages 167-168.

Getting out on your own

Dynamic Climbing Rope – your first rope should probably be a single (as opposed to double/half or twin) 60 meter rope. We'd advise against getting anything shorter. Though 70 meter ropes are becoming more common, they weigh more and are rarely required in the northeast. You should be able to buy a reasonable basic first rope for $130 or less.

- Single rope diameters range from 10.2 mm to below 9 mm. Thicker ropes are generally more durable but will weigh more. A thick durable rope is good for toproping, but a thinner (but less durable) rope is lighter and thus more desirable for lead climbing.
- A non-dry rope is fine for rock climbing and is cheaper. (Dry ropes have a waterproof coating that can be useful for ice climbing.)
- Some ropes have a middle mark that is applied by the manufacturer, and there are also "bipattern" ropes that have a different sheath pattern on each half of the rope.
- Also see "Ropes" in Freedom of the Hills on pages 150-152.

Static rope or webbing – for setting up top-rope anchors

- Static rope is becoming more common practice. It is generally easier to set up a top-rope anchor with static rope, but it costs much more than webbing.
- You can buy 1" tubular webbing (climb spec webbing) by the foot. It generally has a rated strength of 20-22 KN.

Quickdraws – for sport climbing, you use quickdraws to clip bolts.

- You can buy quickdraws, but you can also make your own by buying the components separately. However, quickdraws (at least when on sale) can often be purchased for less than the two carabiners.
- See the carabiners section above for discussion about notch nose versus keylock.
- The "dogbone" is the specialized sling that connects the two carabiners. Ideally your set of quickdraws would have at last a few longer dogbones. Dogbones are typically 12-18cm long and typically have some mechanism (e.g., rubber insert) to keep the rope-side carabiner from rotating.

- Many people buy quickdraws and later convert them to alpine draws for trad climbing by replacing the dogbone with a high-tensile single sling.

Life after the Rock Program

Your life will never be the same after the Rock Program. You'll be constantly asking yourself "When and where am I going climbing next?" Here are some ways to fuel your new addiction.

Be an assistant next year

We love to have graduates come back and help out with the Rock Program. It's a great way to engage with the climbing community, refresh your skills, and give back to the program. Watch for email announcements next spring, and come help out with knots night and the program weekends!

Go Climbing

There are a number of opportunities for climbing around the Boston area. You can often just bring your own personal gear (harness, belay device, shoes) and climb with these groups.

- AMC Boston Rock Program Facebook Group – We have a Facebook group set up for Rock Program graduates and volunteers that you can use to find people who want to go climbing! https://www.facebook.com/groups/amcbostonclimbers/
- AMC Boston Mountaineering Committee Forums - There's a whole subforum for finding climbing partners, see: http://forums.amcbostonclimbers.com
- Boston Rock and Ice Climbing Meetup – there are regular events for climbing around Boston, both outside and in the gym, as well as trips further afield. For more information, see: http://www.meetup.com/bostonrocks/
- Mountaineering, Climbing, & Backpacking of New England Meetup – there are regular events, including many climbing events, in a variety of locations but often in New Hampshire. See http://www.meetup.com/MountaineeringNewEngland/
- Worcester Climbers Google group – a pretty active group/list in the Worcester area. See http://groups.google.com/group/climbworcester/
- AMC Boston Gym Nights - We have regular climbing gym nights usually the last Thursday of every month. Check out the upcoming events on amcbostonclimbers.com or look for email blasts .
- AMC Boston Climbers' Nights – Social events usually held the first Thursday of the month from September through June. Come talk about climbing and share your latest adventure! Look for email announcements or check the website http://www.amcbostonclimbers.com/ for details. Don't be shy about asking to go climb with people!
- AMC Boston Chapter Mountaineering Committee (BCMC) – organizes several climbing weekends:
    - Memorial Day Weekend at Acadia National Park
    - Rumney Weekend in White Mountain National Forest - Early June
    - Summer Open Cabins – between July and September
    - Fall Frolic (or Old Seconds Weekend) – in October at the Gunks
    - Slaydies events - Women centric get togethers focused on building community and mentorship

You generally need to make your own arrangements for climbing partners for these weekends.

Buy some gear

A good place to start is to buy enough gear to go toproping on your own:

- Personal gear – harness, helmet, chalk bag, shoes, belay device, locking carabiner
- Dynamic climbing rope
- Nylon webbing for setting up top-rope anchors – since some Boston area crags have trees far from the edge, we'd suggest at least one 40' piece and a 20' piece of 1" tubular nylon webbing. You may also consider buying static rope instead, but it is more expensive.
- Carabiners for top-rope anchors – at least two for the master point, but when you have bolts at the top, you'll want two locking carabiners to connect to the bolts.

See the "Buying gear" section for more information and advice.

Read some stuff

- You will start receiving The Crux, the AMC Boston Mountaineering newsletter.
- Check the AMC Boston Mountaineering website http://amcbostonclimbers.com/ for information on upcoming events
- Buy or subscribe to some magazines, such as: Climbing, Rock and Ice, and Alpinist.
- Other recommended websites:
    - http://www.neclimbs.com: Loads of info and condition reports
    - http://www.gunks.com: The official Gunks climbing web site
    - http://www.animatedknots.com: The ultimate online knots guide
    - http://www.rockclimbing.com: Climbing routes and info
    - http://www.mountainproject.com: More routes and info

Take other AMC instructional programs

- The Ice Climbing Program – The ice climbing program will hold an informational meeting in early to mid December. Look for an email announcement or check the website for information on the program. Space in the program is very limited and is open to those who have taken the rock program (or have the skills taught there) and have experience in cold weather hiking.
- Self-rescue class – offered twice a year, in the spring and the fall, and taught by a professional instructor. To get the most out of this class, we recommend waiting until you have had some experience building technical (i.e., gear) anchors and leading trad. Email workshops@amcbostonclimbers.com for more information.

See some films

There are a number of outdoor film festivals that are shown in the Boston each year. Of particular interest are: the Reel Rock Film Festival (typically in September or October at the Regent Theater in Arlington) and the Banff Mountain Film Festival (typically in February at the Somerville Theater).

As of 2018 there has been a batch of feature-length climbing documentaries making it into actual movie theaters and onto streaming services, usually related to climbing in Yosemite Valley. Some highlights to check out:

- **Valley Uprising** - History of climbing at Yosemite from the 1950's on up.
- **Dawn Wall** - Tommy Caldwell and Kevin Jorgeson's attempt of the most difficult free ascent in history.
- **Free Solo** - Alex Honnold's attempt to complete the first solo ascent of El Capitan.

YouTube is also a great resource for short climbing videos and some longer documentaries. Gear brands are constantly churning out content featuring their sponsored climbers doing amazing things.

On Leading

Wes Huang

Seconding and toproping are great because you're outside and climbing on real rock, but there's nothing like being on the "sharp end" of the rope. When you're on lead, you're the one who's going to take a fall if you slip or pop off. Leading requires a solid understanding of your own climbing ability and confidence in your technical ability to place protection. It's about calculated risk – the combination of your abilities, the potential consequences, and your level of risk tolerance. I can see how it appeals to the adrenaline junkie, but for me it brings an acute focus on being in the moment: looking for possible handholds and footholds, knowing where my last piece of pro is and where the next will be, and executing every move smoothly and efficiently. No one can tell you when you're ready to lead – that's something you have to decide for yourself.

How to start leading

There are three main ways to start leading:

- Find a mentor – This is perhaps the best way to start leading. Find someone who will show you the ropes (so to speak) and take you to different places to climb.
- Professional instruction – Many guides will teach you to lead, typically in 2 or 3 days of semi-private instruction. This can be a bit costly, but has the advantage of providing professional instruction from a highly trained individual.
- Go out on your own – While not recommended, a number of people have learned to lead this way. There are a number of excellent books that cover the required skills.

Preparations for leading trad

There are many ways to prepare yourself for leading trad:

Climbing outdoors – Just gaining a lot of experience climbing on real rock, toproping or seconding sport or (especially) trad climbs, will serve you well.

Lead climbing in the gym – This can be a good way to start leading. You've learned how to lead belay in the rock program; to lead in the gym you also need to understand how to clip draws (i.e., don't back-clip or Z-clip). You should be able to get someone to show you this in the rock program, but the local rock gyms do offer lead climbing classes. Lead climbing in the gym will give you the experience of leading (and the opportunity to safely take a lead fall!) However, gym lead climbs are all on overhanging walls, so they are more strenuous than trad or sport climbs at moderate grades.

Sport climbing is a great way to start leading outdoors without having to buy a lot of gear. Boston is a 2 hour drive from Rumney (NH), the sport climbing mecca of the northeast!

- You need to learn how to clip bolts, to clip the rope into draws properly, and to clean a sport anchor.

- Beyond what you already have for toproping, you just need some quickdraws. (See the "Buying Gear" section of this booklet for some advice.) There are many easy to moderate difficulty climbs (5.2 to 5.8) at Rumney that have only 4-8 bolts. (See the guidebook for details.) Between you and your climbing partner, you will want at least 8 quickdraws (but ideally 10-12). Don't forget that beyond one quickdraw per bolt, you'll also need draws or other anchor-building stuff (slings or cord and carabiners) for the two-bolt anchor at the top of the climb.
- Please note that you should not top-rope through the fixed hardware (quick clips, etc.) atop sport climbs to minimize wear. Build your own anchor instead.

Reading – There are a number of books you can read to learn more about leading and placing gear:

- Mountaineering - The Freedom of the Hills 9th edition, by Mountaineers Books – Since you already have this book, start here with a review of Chapter 13, "Rock Protection" and then move on to Chapter 14, "Leading on Rock".
- Climbing Anchors, 2nd edition, by John Long and Bob Gaines.
- Rock Climbing Anchors, by Craig Leubben.
- Also see the "Further Reading" section later in this booklet.

Practice placing gear and building technical anchors – It's best to practice on the ground. While you're out toproping, try placing gear in between climbs. Get some feedback from a mentor on your placements and on the rigging for your technical anchors.

Gear

One of the great things about trad climbing is that you get to buy more gear! Shopping for gear is something that you can totally obsess over – not only are there technical specifications and personal preferences to consider, but there's also the challenge of finding everything for at least 20% off list price! (See the "Buying Gear" section of this handbook.)

It's best if you can lead on other people's racks for a while to figure out what types of gear you like and other personal preferences before you buy gear. (For example, what kinds of cams and nuts you like, racking strategies, and so on.) Trad gear isn't cheap, and it's going to last you a while, so make sure you know what you want! It's beyond the scope of this handbook to go into more detail on gear, but you should have no problem finding a "gear head" who is happy to discuss gear ad nauseum.

Your first trad leads

So you've learned to place gear, practiced building technical anchors, and are mentally prepared to start leading. Here are a few suggestions on doing your first leads:

Mock lead – It's useful to practice a trad lead on top-rope. Your belayer belays you on top-rope, but you're also tied into a second rope that you clip into protection as you climb. When you reach the top, you build an anchor, pull up the lead rope, and belay your second from the top. This gives you the experience of doing a trad lead without the risk of falling on your gear placements. Hopefully, your second is your mentor who can give you feedback on your

placements after climbing and cleaning the pitch. Boardwalk (5.5) at Crow Hill is a great climb for a mock lead. Quincy Quarries has several climbs that are also suitable.

Your first trad lead – Find a climb well within your climbing ability. Hopefully you are doing your first trad lead with a mentor who will give you feedback on your placements after he or she climbs and cleans the pitch. Note that trad leading is not just about placing gear correctly; there's also the questions of where to place it, whether to extend the draw, protecting the second, rope drag, and so on. In addition, you are now responsible for route finding! Again, Boardwalk at Crow Hill, and several climbs at Quincy Quarries are good for first leads. There are also many easy-to-moderate climbs in the Gunks that are suitable for a first lead. One strategy at the Gunks is to choose a climb that has an easy last pitch and you can swing leads with your mentor!

Don't push the grade – You shouldn't be in any rush to push the difficulty of your trad climbs when you start leading. Take some time to do climbs well within your climbing ability and just gain experience placing gear and building anchors.

Guidebooks

As you start leading trad, you'll want to start your collection of guidebooks. There are a number of iOS/Android apps that are now available:

- *MountainProject app* (free) – take the web site with you when you climb!
- *The Gunks App* ($$) – has great photos of routes and their starts but thin on beta and doesn't have all the routes in the guidebooks.
- *rakkup App / Rock Climbs of Acadia* ($$) – the App version of the guidebook to climbing in Acadia National Park.

Here are some guidebooks that should (probably) eventually be in your climbing library:

- *Boston Rocks, 2nd edition*, by Richard Doucette and Susan Ruff. Covers climbing and bouldering in the Boston area (east of Worcester).
- *Rumney, 2017 edition*, by Ward Smith. Covers sport climbs, bouldering, and the few trad climbs at Rumney (NH).
- *The Climber's Guide to the Shawangunks: the Trapps*, by Dick Williams. This is the grey book with the salamander on the cover that "everyone" has. This book is comprehensive, but it can be difficult to route-find from the descriptions/photos.
- *The Climber's Guide to the Shawangunks: the Near Trapps and Millbrook*, by Dick Williams. Most of the moderate climbs at the Gunks are in the Trapps, but there are some in the Near Trapps that you may want to do someday.
- Other guides to the Gunks include *The Gunks Guide* by Todd Swain. This and other guides to the Gunks are generally not as comprehensive as the above but may have better route photos/descriptions.
- *North Conway Rock Climbs*, by Jerry Handren. Covers the east side of the White Mountains, including Whitehorse and Cathedral in North Conway and much more.
- *The Notches* by John Sykes. Covers the west side of the White Mountains, including Cannon cliffs, but not Rumney.
- *Rock Climbs of Acadia*, by Grant Simmons. Covers climbing in Acadia National Park.

Further Reading

In addition to this list, also see the recommended books and guidebooks in the “On Leading” section.

Skills

The following books can add to your skills as a climber:

- The Mountaineers is an outdoors non-profit, similar to the AMC, based in Seattle and publishes a wide variety of books on climbing (including our textbook). See their full selection at https://www.mountaineers.org/books. Highlights include:
    - *Rock Climbing - Mastering Basic Skills*
    - *Advanced Rock Climbing - Expert Skills and Techniques*
    - *Rock Climbing Anchors - A Comprehensive Guide*
    - *Sport Climbing - From Toprope to Redpoint, Techniques for Climbing Success*
    - *Climbing Self Rescue - Improvising Solutions for Serious Situations*
- Falcon Guides also publishes a wide variety of books on climbing. See their full selection at http://www.falcon.com/books/category/Climbing. Highlights include:
    - *How to Rock Climb!*
    - *Advanced Rock Climbing*
    - *Climbing: From Toproping to Sport*
    - *Climbing: From Sport to Traditional Climbing*
    - *Self Rescue*
    - *Climbing Anchors*
    - *Crack Climbing!*
- *The Self-Coached Climber: the guide to movement training performance*, by Dan Hague and Douglas Hunter, published by Stackpole Books. Starts with principles of movement in climbing and continues on to physical and mental training.

History

The development of climbing over its history, the accomplishments of different generations of climbers, and the evolution of the techniques, equipment, and attitudes of climbers makes fascinating reading.

- *Yankee Rock and Ice: A History of Climbing in the Northeastern United States* by Laura Waterman, Guy Waterman and S. Peter Lewis, published by Stackpole Books, THE book on the history of climbing in the Northeast, a great read and highly recommended.
- *Camp 4, Recollections of a Yosemite Rock Climber* by Steve Roper, published by The Mountaineers, the early history of big wall climbing in Yosemite Valley.
- *Climbing in North America* by Chris Jones, published by the University of California Press – A thorough, if somewhat old (1976) book, detailing the history of mountaineering with more of a focus on western North America. Although out of print, new and used copies are available online.

Other

Accidents in North American Climbing– published every year by the American Alpine Club (AAC), this book contains descriptions and analysis of accidents in rock climbing, ice climbing, and mountaineering. The purpose of this book is to make people aware of common dangers and mistakes in climbing so that they can become safer climbers. For the last few years, there has also been a “Know the Ropes” article that describes best practices in a particular part of climbing (Rappelling in 2012, Lowering in 2013). If you join the AAC, you receive a copy of this book as part of your membership.