

Boston AMC Mountaineering Section – Rock Climbing Program 2005

Instructional Notes: Introduction to Trad. Climbing

Introduction:

The rock program is intended to introduce new people to the sport of rock climbing by exposing students to essential skills through a safety based participatory development program. The culmination of this program has traditionally been “New Second’s Weekend” held at the Gunks. New Seconds is by invitation to program participants that have successfully demonstrated the essential skills taught during the rock program.

The objective of the introduction to trad. climbing portion is intended to give students exposure to the tasks required by a second in a multi pitch continuous climbing situation. These aspects include how protection gear is placed and removed, racking gear during the climb, and how gear is exchanged at the belays. The intent is to make the new seconds weekend as predictable as possible and enjoyable for all!

Key Content to be demonstrated:

1. Discuss placement/removal of three common types of protection gear: nuts, tricams, and active camming devices.
2. Demonstrate nut tool use, sling/anchor management, and gear racking.
3. Allow students to handle the gear, slings etc... to develop a functional understanding of how it works.
4. Watch gear get placed by a leader on a short pitch and then follow the lead to clean the pitch.
5. Student displays competent lead belay technique and uses climbing calls.

Teaching Process:

The process to demonstrate these skills during the class is as follows:

1. Groups of 4 students will rotate through a station staffed by 2 or 3 program designates including at least one “instructor.” The instructor will provide a brief verbal overview of the content described above and provide some basic demonstrations to the students.
2. The student group will break into two groups of 2. Two students will go with the instructor to a preset pitch; one student will fix into a set belay, and belay the leader up the pitch placing gear. (The 2nd student will belay the leader on top rope.) Once at the top of the pitch the leader will belay the student up while the student cleans the gear. Once the pitch is complete the leader and student exchange the gear. Requisite climbing calls should be used through the process (on belay, climbing, take, slack, of belay). The students will then exchange places and repeat the process.
3. The other 2 students in the original group will spend time with an assistant instructor practicing placing gear and removing it. Practice using the nut tool and sling management.
4. These two groups will rotate so that each student gets to spend time at each station. The objective is to move the 4 students through this process in an hour. At the end of the exercise the students need to get a sign off sheet initialed.

Key elements instructors and assistant instructors should be looking to assess are as follows:

1. Did the student read a sufficient portion of John Long’s “Rock Climb” book provided as part of the program to be able to identify the types of gear and have some basic understanding of how its used? (Ask them if they read the ropes, anchors, and belays chapter!)
2. Was the student able to grasp the basics of how to put in and more importantly remove gear without damaging it or jamming it so it would be hard to remove. Opportunity for this will be at both stations.
3. Was the student reasonably proficient with a nut tool.
4. Did the student manage racking the gear and pass it off to the leader.

Skill Section 1: The Climbing Process

What is “protection” or “gear” and how is it used in lead climbing to protect the climb leader is a common question. The difference between a lead climb and top roping or giving another climber a social belay is that in a lead climb the leader must fix gear into available cracks or features in the rock, then attach a sling to the gear and to the climbing rope to protect the climbers from falling. So the leader puts in protection as the climb proceeds. Once the pitch is completed (commonly a 50m rope length), the leader makes a new belay station, ties in and then brings the second up. As the second climbs they are responsible for removing the protection and neatly racking it. Once the second completes the pitch, the second ties into the belay, gear is exchanged with the leader and this process repeats itself until the route (usually multiple pitches or leads) is complete

Because the leader is tied into the lead end of the rope and the second is at the other end of the rope tied to an anchor, with the protection pieces in between, the outcome of a leader fall is dependent on how well the protection holds, how far above the last piece the leader is, what’s underneath the fall area, and how quickly a second can break. A key aspect of this is the amount of slack in the rope. Although the rope needs to have some play, too much slack in the rope can be a dangerous situation and so attention at all times to the status of the leader and amount of rope slack is important. Pay attention! And be prepared to follow the leader’s commands. A final note regarding rope management when belaying a leader is “rope calls,” most leaders like to know when they are halfway through the available rope and when there’s about 15 feet left before running out. As a second you should discuss this protocol with your leader before the climb.

Skill Section 2: Nuts, Tricams, Cam Devices

NUTS are machined pieces of metal with fixed wire loops attached that are used in tapering vertical or horizontal cracks. Nuts come in a variety of sizes and shapes but basically all work the same way. A nut is selected based on its size and taper relative to the crack so that when it is fitted at least 3/4 of the nut’s faces are in contact with the rock. If a leader falls on the correctly placed nut, the load of the fall will be absorbed in the rope, sling and across the surfaces of the nut in contact with the rock. So with a nut making sure it fits appropriately into the crack is important.

- Nuts can be placed on either of two opposing sets of parallel faces.
- Hexcentrics, not commonly used anymore, are similar to nuts.
- Nuts are best removed in the identical order in which they were put in, except the reverse. So, before starting to just try and pull it out look and figure out how it was most likely put in. Commonly the leader will “set” the nut before leaving the placement by lightly pulling on it to make sure that rope movement won’t dislodge it. So typically, a first step is to gently push back on the nut to dislodge it. Next, the nut can be worked out of the crack by moving it to a large enough opening where it can be extracted.
- Avoid bending or kinking the nut wires, do not bash the nut with the nut tool unless necessary.
- Practice nut removal, everybody uses them.

TRICAMS are generally forged metal elliptically shaped with a point along one side and have a permanently attached sling. Tricams are particularly useful in narrow horizontal cracks where the point on one side in conjunction with the flats on the opposite side wedge the device in place. The key in placing a tricam is finding a slight relief or bump in the rock in which to “set” the point of the device so that under sudden load it will resist pulling out before it wedges in. To remove a tricam it is best to rock it loose along the long axis, and then remove it from the crack or pocket the way it appears to have been put in reverse order.

- Tricams come in a multitude of sizes but the smaller ones are most popular, size is designated by color: pink is smallest, then red, brown, and blue.

Skill Section 2: Nuts, Tricams, Cam Devices cont'd

CAMMING devices are easily identified because they are spring-loaded and have opposing elliptically shaped arms that move around a central fixed (rigid or flexible) stem to which a sling is attached. Cam devices work especially well in parallel-sided cracks of either vertical or horizontal orientation. When a load is applied to the cam the force is translated through the stem and into arms, which expand outwardly to grab into the opposing walls. Cams are very cool and fun to play with, the trigger which is commonly part of the stem design, allows the cam arms to be retracted or expanded depending on how much the trigger is pulled on.

- When placing a cam, for it to be effective, it must not be over or under cammed. That is to say that the cam arms should be typically retracted between 25% to 65% (approximately). If the device is under/over cammed it may not hold a sudden load.
- Cams can “walk”, in other words once set in a crack if the sling pulls on the cam in a side-to-side fashion the device can actually move itself from its original placement. Pay attention to this.
- When removing a cam, which is a very expensive piece of gear, be careful not to over trigger the device and push it deeper into the crack...you may not be able to get it out! The best approach is to slightly pull on the trigger just until you can feel the cam loosen, then start to work the cam out of the crack while concurrently pulling on the trigger to provide the clearance needed to get it out.
- Don't get sand or dirt on cams, pay attention to the condition of the trigger springs, sling, and other parts including the machined surfaces of the arms that create the load points.
- Cams are used a lot by everybody because they are easy and fast to place.

Other types of protective gear exist including sliding nuts, lowe balls, bigbros, pitons, and bolts. It is unlikely you will encounter having to place or remove these types of protection so don't worry about them. If you can master the concepts of nuts, tricams and cams you will be in good shape and be able to apply those principals to other types of protection.

Skill Section 3: Nut Tools

There are a variety of designs on the market today but they all work pretty much the same. In a nut tool you should look for one that's rigid and has a hook on the end. It should be ergonomic to hold onto. You should tie off your nut tool with a 1/8" to 1/16" diameter parachute cord by about 3 feet and attach the other end to a carabiner to create a tether (this is a preference thing). When not in use the nut tool can be stored on the biner and attached to your climbing harness. The tether can be useful in avoid accidental loss of the tool.

Skill Section 4: Sling Management/ Gear Racking

When cleaning a pitch you will encounter protection gear inserted in the rock, attached to a carabiner that is attached to a sling, which is attached to the climbing rope by another carabiner. Generally it is best to unclip the carabineer from the protection, and then from the rope, and then slip one of the carabiners through the other carabiner and then reclip the sling. This makes a neat loop that can be clipped to your harness and is easily passed along to the leader during gear exchange. Alternatively, the entire sling can be placed around your neck with it being under one arm. Then the gear can be removed and clipped to a spare carabiner intended for racking the gear. It is probably best to discuss these sorts of details with a leader to understand the options and benefits of each preference.

Once a pitch is completed the second will pass the collected gear back to the leader. Generally it is best to pass the leader the gear in a logical order like protection pieces and then slings. The leader will rrack as they see fit to organize the gear for use on the next pitch. NEVER ASSUME the leader is holding onto gear before letting go; make sure they have it before letting go.

Happy Climbing!!!