

MOUNTAINEERS

Field Guide

There are many great books and outfitters that can teach you the skills and knowledge needed in the backcountry. Here at High Trails we believe a mountain trip is a lot more than a push for the summit or an exercise in survival skills. Going into the mountains gives us the opportunity to enjoy beautiful views, to see nature undisturbed, and to escape the daily routine of life. Mountaineering is a team effort, and mountain trips challenge groups to work together, use decision-making skills as a team, and utilize the abilities and knowledge of each person within the group. Successful cooperation and communication among group members leads to a smooth trip, providing memorable experiences for all.

Mountaineers will discuss and practice skills that will give students an understanding of how to prepare for, conduct themselves in, and enjoy the outdoors. Teamwork, setting goals for a trip, and communication all play a part in a group's decisions about what gear to bring, how to find and stay on-route, how to minimize impact, and how to safely enjoy the trip.

“Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flow into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop away from you like the leaves of autumn.”

-John Muir

Contents

What students understand...

Qualities and character traits of a mountaineer
Rewards of spending time exploring the outdoors

Preparation and essential gear for any trip
Decision-making within a group
Knowledge of the tools for survival outdoors

History of the use of orienteering
How to use route-finding in everyday life
Geography; how to use known landmarks and landforms in route-finding
Astronomy; the North Star and other constellations

Climbing safely, team building, communication, setting reasonable goals, physical activity

How to understand a topographical map
Geophysics; how the compass works
Integration of the two tools to aid in orienteering

What to do when lost; safety and awareness
Biology; behavior of the body in extreme conditions
Biology; behavior of the body in extreme conditions

Leave No Trace ethics, conservation and preservation of public resources

Mountaineer All-Day

Campsite selection, setting up a tent, collecting wood and building a fire, water treatment, waste disposal, and food storage

Response in emergencies, cooperation and communication skills

What students do...

Meet famous mountaineers
Set the role for the day

Ten Essentials Challenge

Orienteering Overview
Discussion of past and present
Navigate in teams

Rock Scramble

Read maps and practice compass

Live through survival skill scenarios

Discuss Leave No Trace
Conclude the day

Set up base-camp

Improvise while building shelters

Equipment:

Half-Day: Ten Essentials Pack (should include maps, compasses, sunglasses, sunscreen, extra clothes, food, water bottle, headlamp, 1st aid kit, lighter, knife, rain gear), survival scenarios

All-Day: All Half-Day materials, tents, sleeping bag(s), fire-building supplies, cook stove and pots, tarps, cords

Mountaineers for Staff and Teachers

An effective method for keeping an active and engaging discovery group and teaching the content in-depth is to introduce and teach main concepts as a whole group, while letting students explore these lessons in detail within small groups led by a high school counselor. As group leader, it is important to decide which topics need elaboration within small groups, and to make sure that counselors are able to effectively convey important information. Additionally, a teacher or staff member must be present and active at the Rock Scrambling station for safety. Staff should create a 'mountaineering expedition' theme by dressing ready for a high mountain climb and organizing students and counselors into 'summit groups' for the hike and subsequent small group rotations.

Enduring Understandings:

What are the big, real world ideas students will understand?

- Planning, preparation, and knowledge of essential gear are the foundation of any outdoor adventure.
- Good decision-making skills and communication give a group the ability to respond to any emergency situation, whether in the backcountry or in the backyard.
- Knowledge of orienteering, survival, and camping techniques allow us to experience the joy and value of being able to comfortably and safely explore the outdoors, while leaving it in as good as or better condition than we found it.

Essential Questions:

What problem, question, inquiry needs to be uncovered?

- What skills and qualities of the mountaineer can be cultivated to apply to our lives?
- What tools, equipment, and knowledge are needed to explore outside the comfort and convenience of modern society?
- What is so rewarding about being outdoors, and why?
- What is the value of protecting and preserving undeveloped areas?

Students will be able to: (skills)

- Help plan and prepare for their own outing of at least one day
- Navigate their way along a route using basic orienteering skills (map and compass, landmarks, astronomical features)
- Safely explore outdoors with friends and family

Students will know: (knowledge)

- The type of equipment on The Ten Essentials list, and how it will help you stay prepared for any situation
- How people use orienteering and route-finding everyday
- How to evaluate and respond to survival situations in an outdoor environment
- The value of the Leave No Trace principles, and of conservation of our wild areas
- The basics of camping and campsite procedure

Tips for a successful discovery group:

The Mountaineers discovery group has a less historical connection than most of our other discovery groups, and for this reason it is important to relate the lessons of the group into students' everyday lives. The main topics that are covered in the full-group setting can be directly linked both to students' outdoor explorations after High Trails, as well as to how they think and act on a daily basis. During the Half-Day, make sure that high school leaders are prepared to teach their small group individually on the first morning—you will want to accompany the Rock Scrambling group on the first rotation to show them proper locations, techniques, and safety. Slopes below either A or B Bluff work well to provide spots for the Survival and Map & Compass group as well as a high point for the Scrambling group.

Colorado Academic Standards Met

Established Goals:

Grade Level Expectation: Sixth Grade

Content Area: *Social Studies*

Standard 2. Geography

Concepts and skills: 1. Use geographic tools to solve problems.
2. Human and physical systems vary and interact.

Content Area: *Science*

Standard 2. Life Science

Concepts and skills: 1. Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species.
2. Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem.

Content Area: *Reading, Writing, and Communicating*

Standard 1. Oral Expression and Listening

Concepts and Skills: 1. Successful group discussions require planning and participation by all.

Grade Level Expectation: Fifth Grade

Content Area: *Social Studies*

Standard 2. Geography

Concepts and skills: 1. Use various geographic tools and sources to answer questions about the geography of the United States.
2. Causes and consequences of movement.

Content Area: *Science*

Standard 2. Life Science

Concepts and skills: 2. Human body systems have basic structures, functions, and needs.

Grade Level Expectation: Fourth Grade

Content Area: *Social Studies*

Standard 2. Geography

Concepts and skills: 1. Use several types of geographic tools to answer questions about the geography of CO.
2. Connections within and across human and physical systems are developed.

Content Area: *Science*

Standard 2. Life Science

Concepts and skills: 3. There is interaction and interdependence between and among living and nonliving components of systems.

Standard 3. Earth Systems Science

Concepts and skills: 1. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth.

Content Area: *Reading, Writing, and Communicating*

Standard 1. Oral Expression and Listening

Concepts and skills: 1. A clear communication plan is necessary to effectively deliver and receive information

Setting the Role

Objectives: 1. Assess the qualities and character traits that are important for Mountaineering.
2. In groups, establish anticipation by planning summit objectives and member responsibilities.
Time: 10 Minutes

After taking roll at the stake and introducing the discovery group topic, divide into four counselor-led groups for the hike to Lower B-Bluff Lookout. Prior to the hike, give counselors and small groups a verbal prompt to create anticipation for the day's activities. Prompts can be used individually, in combination, or with whatever additions you design.

Expedition Model

Ask counselors and small groups to decide on a summit objective, and discuss how they would plan and implement such a trip. In this model, they should come up with an expedition team name, a trip destination or objective, and responsibilities for each member of the team (i.e. menu planner, route finder, gear manager, etc.).

Historical Model

Prepare counselors to portray the character of one of the historical Mountaineers from the resources section of the curriculum. Counselors should role-play their character for their small group of students, and while hiking, ask students about other famous Mountaineers they know, and what they have accomplished.

Questions to ask:

Who has been on a camping trip?

Discuss the range of trips from long backpacking trips to car camping on the 4th of July, or an afternoon exploring in the woods near your house.

What are some of the pleasures of being outside?

Look around you! Views, weather, lack of urban noise, animals, plants, being active with your friends...

Do we have to climb a mountain to its summit to make a trip successful?

Many associate mountaineering with physical exhaustion, pain, and striving for the peak. Those qualities can be part of a trip, but here at High Trails we have a different attitude about taking a mountain trip.

What character traits did the mountaineers you met or know of have?

Courage, strength, persistence, patience, cooperation, good planning, decision making...

We are also going to discuss some of the risks and hazards that confront us while outdoors. To help facilitate a smooth and enjoyable trip, we need to be aware of how to prepare for and respond to harsh conditions, injury, or other unexpected events. We will discuss Orienteering, Survival, Rock Scrambling, and The Campsite, and learn how to properly organize and facilitate our own outdoors trips.

"We do not stop hiking because we grow old, we grow old because we stop hiking."

- Anonymous

The Ten Essentials

Objectives: 1. Evaluate items that help you survive outdoors, then justify which are most essential and why.
2. Establish the importance of planning and preparation for a safe trip

Time: 20 minutes

Upon arrival at the Lower B-Bluff Lookout, have small groups present what they have discussed during the hike, giving their expedition team names and responsibilities, or telling the whole group about some of the famous mountaineers they discussed.

After this, describe the Ten Essentials Challenge to the group. You should bring out the Ten Essentials Pack, including all of the items on the Ten Essentials list, as well as additional gear that can come in handy while exploring outdoors. Show the pack to the group, and explain the history of the Ten Essentials. Tell groups that they will have 10 minutes to come up with a list of 10 essential items. After this time has passed, groups will present, with each group naming one new item from their list per round. If this item is on the Ten Essentials list, that group earns two points. If the item is not officially on the list, but is along with you in your pack, that group earns one point. As each item is named, you should remove it from the pack, pass it around, and discuss its merits.

Note: Make sure high school counselors let the students in their group develop their own list-the counselors will be somewhat familiar with the 10 essentials, and shouldn't give them away to their group.

History of the Ten Essentials

The original 10 Essentials list was assembled in the 1930s by The Mountaineers, a Seattle-based organization for climbers and outdoor adventurers. They created the list to answer two basic questions: first, *can you respond positively to an accident or emergency that occurs in the backcountry?* Second, *can you safely spend a night - or more - out?* Over the years, the list has been slightly modified to reflect new techniques and technology, but this main idea remains the same. On a routine trip, you may only use a few or even none of these items, but packing them along at all times while exploring outdoors is a great habit to learn, and will keep you prepared for whatever occurs on your trip.

The Ten Essentials:

1. Navigation (map & compass or GPS)
2. Sun Protection (sunscreen, sunglasses, hat)
3. Insulation (extra clothing - synthetic, not cotton)
4. Illumination (headlamp or flashlight)
5. 1st Aid Kit
6. Fire starter (matches, lighter)
7. Repair Kit and Tools (duct tape, P-cord, glue, etc.)
8. Nutrition (extra food)
9. Hydration (extra water)
10. Emergency Shelter and Rain Gear

Additional Survival Gear: Whistle, communication device (cell phone, radio, satellite phone), signaling mirror, sleeping bag, cooking supplies

"When you are down and out, and you have lost all your dreams, there is nothing like a campfire, and a can of beans."

-Tom Waits

Introduction to Orienteering

Objective: Investigate and discuss the history, importance, and different types of human navigation.

Time: 20 minutes

We use orienteering skills everyday: in the mall to find the nearest food court, walking to the bus stop, or making your way to your friend's house on your bicycle. This section should provide a solid introduction about how people have developed and used direction-finding skills over time and today, but should leave technical map and compass details for the small group stations later.

History of Orienteering

Orienteering skills can be introduced in a historic context, an earth science context, or both. Describe the separate individual techniques that have been used, while stressing the integration of every method for successful orienteering today.

Questions to ask:

How did people navigate in the past? Take a minute and imagine...

Landmarks are a key element in navigation ("go to the big tree trunk that is struck by lightning" or "turn left after the McDonalds"). Note that this is one example of the importance of communication within and between members of the group!

What landmarks do you see that you would use to find your way or describe location?

Pike's Peak, trees, rocky formations, buildings, bodies of water, etc...

How can you use Pike's Peak as a landmark?

Here at High Trails, Pike's Peak is to our east, but in Colorado Springs, Pike's Peak is to the west

What is an everyday occurrence that could aid in providing direction?

People realized the sun rises and sets in roughly the same spot each morning and evening and began to use this as a landmark

What about nighttime when the sun isn't up?

The Ancient Phoenicians navigated the oceans using Little Bear (the Little Dipper) knowing that it was always to the north. The North Star, Polaris, is one of the stars in this constellation. It stays directly above the North Pole at all times. There are a few good folk tales about the North Star, Big Dipper, and Little Dipper, which you can include here. Over time, instruments like the sextant, astrolabe, and pole staff were developed to provide more precise navigation, primarily to ships at sea.

What system was invented to divide the Earth? Can anyone name two important grid lines?

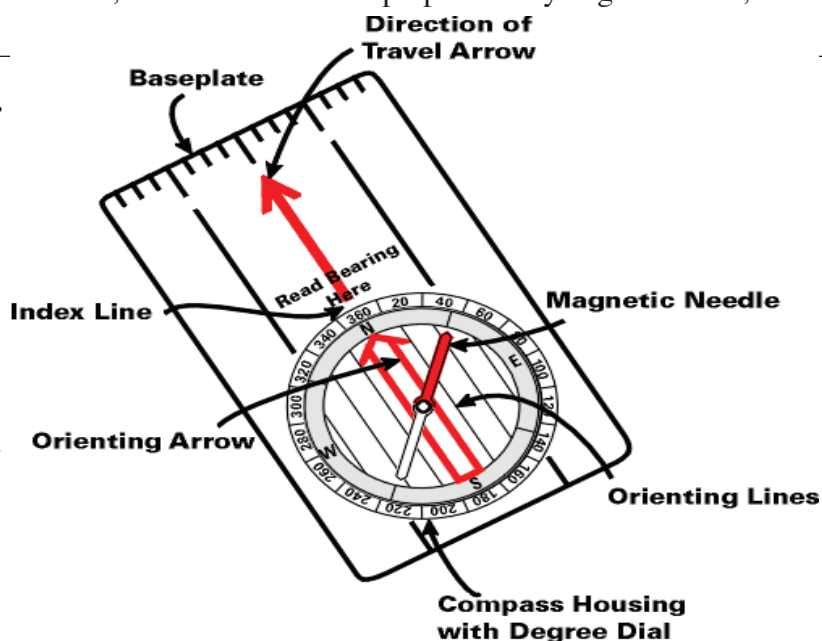
The global grid divided earth by lines of latitude and longitude by degrees to 360. The prime meridian and the equator are the two major reference lines, and location can be pinpointed by degrees north, south, east, or west of these lines.

Explaining perspective through orientation...

-How do you view your surroundings? From a landscape or aerial view?

-How do our maps represent the landscape? Do other cultures perceive or represent landscapes in the same way?

-If you were creating a map of unexplored territory, how would you convert your viewpoint to an aerial perspective without using an airplane or helicopter?



Breakout Groups-Map and Compass, Survival, Rock Scrambling

These groups will all be led by high school counselors, and will need to be prepped on a more in-depth basis than the standard small group in other curriculums. It will be challenging to monitor all three groups on the first rotation. Take a break upon reaching your split-up spot, and pull the teacher aside to show them the best spot for the Rock Scrambling group. That way, the teacher can accompany and monitor this group on the first rotation, while you help teach the more technical information on the Map and Compass group.

Map and Compass

- Objectives:**
1. Analyze the topographic map and distinguish its features from those of a standard map while demonstrating its function as a 2-D representation of a 3-D surface.
 2. Examine the different parts of the compass and observe how the needle responds to the Earth's magnetic field.
 3. Combine the two tools, and use the compass to orient the map.

Time: 20 minutes

Topographic Maps - Major Features of the Map

-**Name:** the name of a map usually points out a major physical feature

-**Legend:** Tells us the scale at which the map depicts the area. 1:100 would mean that 1 unit on the map is 100 units in real life. This also tells us contour interval - the distance between each contour line.

-**Numbers at the Corners:** Remember one of the ways the Earth's surface is divided on maps, is via meridians (longitudes), circles on the Earth crossing both Poles, and parallels (latitudes), running perpendicular to the Earth's axis. These are measured in degrees.

-**Contour lines:** topographic or contour lines allow us to read a flat map. Lines that are close together depict steep inclines or cliffs, lines far apart are flat (see contour line activities).

-**Color:** see if you can determine what different colors represent!

-**Compass Rose:** directs you to both Magnetic and True North.

Contour Lines - a vital but challenging part of teaching the Topographic map

-Contour lines are what give a map its 3-D aspect. It is the most important part of this group, and is key for students to leave with an understanding of how contour lines work.

Topo lines resource sheet and aerial photos:

Use the sheet in the resource section, which represents a variety of landforms and asks you to match them with their topographic representations. Then, show students some aerial photos and ask them to draw topographic representations on blank sheets of paper.

Knuckle Lines:

Draw a series of topo lines on your knuckles, representing what your knuckles would look like on a map if they were a series of peaks along a ridge. When you make a fist, the contour lines will be 3-D, as in real life, and when you flatten your hand, the lines will appear as if on a map, in 2-D. The drawback of this technique is that it is not as interactive, so combining it with another method could work well.

Mapping with Play-doh or in the dirt:

The leader or small group can create a hill out of Play-doh or natural material, and add topo lines along the outside of the formation with thin string. This can be good for younger groups, and can address a variety of learning styles, and students can see, hear, and do in the same activity.

Map and compass continued...

Hints for reading topographic maps...

- Hills are indicated by bullseye patterns-the smallest circle in the center of the bullseye is the hilltop
- Valleys are represented by a series of 'V' shapes, with the point of the V pointing uphill
- The closer the contour lines, the more steep the slope. The wider the lines, the more gradual the slope.

Beyond contour lines: *What else can the topo map tell us?*

How forested is an area?

All areas shaded green on a topo map are vegetated enough to hide a platoon of soldiers (50) from aerial observation, a holdover from military map use. Tan or white areas are not vegetated enough for hiding.

What are the major features of an area?

High mountain peaks, large rivers, lakes, or roads leading back to civilization.

What kinds of human interaction with the landscape occur?

Do people live in this area? What kinds of recreation opportunities are there? What is the elevation, and how might this affect weather patterns?

The Compass

How does a compass work?

The magnetic compass is an old Chinese invention. The oldest picture of a magnetic compass dates back to 200 BC. The Chinese used the compass with a rectangular table, having the edges marked with the cardinal directions and constellations. The needle was a small spool made of magnetic iron ore. When the spoon was placed on the table, it turned so that the handle was pointed north.

The idea of the compass you have in your hand is the same! The needle is made of something magnetic, and it floats in a liquid to keep it steady.

The Earth has a magnetic field due to electric currents caused by the movement of iron in the Earth's core. This might go a little far to explain, but an easy way is to say there is effectively a bar magnet buried in the Earth that is almost – but not quite – lined up with the North and South Pole. Because of this, the magnetic needle of the compass aligns itself with the magnetic field of the Earth, and points one end towards North (the red end) and one end in the opposite direction, South (the white end).

Activity: Make your own Compass!

Materials: Cork, needle or paper clip, bowl, water, magnet

- Directions: 1. Magnetize needle/paper clip by rubbing against magnet for 60 seconds from top to bottom.
2. Place needle on cork or paper to float it on surface water.
 3. Needle will spin until pointing North/South.

Orienting the Map

Although there are a number of different functions that can be performed with a map and compass, we will focus on the simplest: orienting the map. As we learned above, the red end of the needle points North. All that is required to orient the map is to align the North direction on the map with the direction that the red part of the compass needle is pointing. This is most conveniently done on a flat surface, such as the ground, and by placing the compass on top of the map, near the compass rose on the map.

Keep it simple for the students: no movement of the compass or compass parts is necessary. All they need to do is point North on the map in the same direction as the red part of the compass needle.

The importance of orienting the map: Now the aerial view that is seen when looking at the map is correctly aligned with the way the land actually lies. You should be able to use the information from the aerial view on the map to pick out landmarks around you!

Survival

Objectives: 1. Use decision-making skills as a group to respond to emergency situations involving exposure related illness, injury, and other unexpected outdoors crises.
2. Confirm the causes of different types of outdoors ailments, and deduce the best ways to react to them.

Time: 20 minutes

In this small group, the high school counselor should be prepared to enthusiastically lead students in acting-based scenario challenges. For each challenge, the counselor will pull one member of the group aside to give them a special assignment-this student will be the victim of the particular symptom for that emergency. The remaining members of the group need to decide how to respond, questioning the victim, using the gear from the Ten Essentials Pack, and acting out their response to effectively deal with the situation.

Scenario 1: Hypothermia

Symptoms: shivering, confusion, slurred speech, cold and pale skin, the ‘umbles’: stumbles, grumbles, fumbles, and mumbles.

Scenario:

(give the victim an overview of their symptoms, read this to the whole group, and have them act out the scene).

Your group is hiking back to the campsite after a full day on the trail, and is excited to make some dinner and sleep well. Less than a mile from camp, _____ (the victim) slips while crossing a creek, falling into the stream, and soaking parts of their clothing.

Causes and treatment of hypothermia

Hypothermia is a drop in core body temperature due to prolonged exposure to cold and wet conditions, which remove body heat faster than it can be produced. Temperatures do not need to be below freezing for hypothermia to take effect-dangerous conditions can exist at temps up to 50 degrees. Two important scientific processes prevent the body from retaining heat in these types of situations.

Convection: cold wind can blow by, pulling heat from the body as it moves past.

Conduction: direct physical contact with objects at lower temperatures than the body causes heat to move from your body to these objects (the ground will easily pull heat from your body even in mildly cold temperatures. Water and wet clothing will conduct heat away from your body at rates up to 4 times as fast as normal.

Treatment should include moving the patient to a warm spot, removing any wet clothes, wrapping in dry and insulated layers (a sleeping bag is great!), drinking hot liquids, preferably with sugars, and eating fats and carbs, like bread and chocolate.

Scenario 2: Broken Ankle

Symptoms: pain at ankle, swelling, ankle has high sensitivity and is painful to touch, and unable to bear weight.

The Scenario:

Your group is hiking down the big boulder field after having climbed to the summit of Pike’s Peak, when _____ trips, lands awkwardly, and yells in pain.

Treatment of minor sprains or breaks

Make the patient comfortable, and employ the acronym RICE (Rest, Ice, Elevation, Compression). Keep the patient warm, dry, hydrated, and fed, and consider constructing a splint to help brace the ankle. Keep the patient in place, and only attempt to move if bad weather is on the way. Instead, call for help and wait for professional medical workers to arrive.

Scenario 3: Heat Exhaustion and Heatstroke

Symptoms: red, hot, dry skin, high body temperature, rapid, strong pulse, headache, nausea, impaired judgement

The Scenario:

While in Grand Canyon National Park, your group decides to hike to the canyon floor. On the way back up to the rim, _____ collapses on the side of the trail, where he/she is close to unresponsive, and cannot stand back up.

Causes and treatment of heat related illness

Heat exhaustion, and its more severe sequel, heatstroke, are caused by an increase in body temperature due to prolonged exposure to the sun, hot temperatures, and overexertion. Sunburn, headache, and nausea are the immediate results of overheating, and they can be exaggerated due to lack of hydration, rest, and shade. The sun also has more severe effects on us at higher altitudes, because the sun's rays have less atmosphere to filter through before they hit our skin. Light from the sun converts energy to your body in the form of heat, through the process of Radiation.

Treatment should focus on getting the patient out of the direct sun, into a cool, shady, relaxing spot. Drinking cool liquids, removal of constrictive clothing, and rest are the most important remedies.

Scenario 4: Lost in the woods

Symptoms: lost team member has been separated from the group for about half an hour, has not been seen in that time period, and does not respond to shouting. (After giving the student this information, send them away from the group before reading the prompt)

The Prompt:

While hiking along the trail, _____ realized he/she forgot a water bottle the last time the group stopped for a break. They went back to retrieve it, while the rest of the group waits along the trail. After 30 minutes, they have not returned, and you get no response when shouting their name.

Proper response to being lost, and to having lost another member of the group

If you are alone or with others, and realize that you do not know where you are, are out of sight of any trail, and do not know when you lost your way, there are some things you need to do:

-Stay calm, and stay where you are. Do not try to find your way back to where you last remember being on the trail. Your group should know the approximate area you could be in, and trying to find your way back might increase the distance between you and them, making it tougher for them to find you.

-Do not cross any fences, waterways, or other dividers. Once again, staying put is the best way to deal with being lost. Most lost hikers are found within 12-24 hours. Assess your supplies, and make yourself comfortable by building a fire and shelter.

Finding a lost group member

Once you realize that a group member or members may be lost, stay calm. Talk as a group, and think about the last time you saw the lost person. Yell their name, but stay in the centralized spot where you stopped. The most important thing is to make sure that a member of the search party does not become lost while searching. Slowly spread out in pairs, periodically returning to the spot where you stopped. If the lost person is not found within an hour, call for a rescue.

Rock Scrambling

Objectives: 1. Experience the sensory and physical challenge of climbing rock.
2. Develop proper and safe techniques.
3. Gain a feeling of accomplishment and self-confidence.

Time: 20 Minutes

A great place for this second station is the ledge below the rocky portion of A-Bluff, before the trail hooks around the backside to gain the summit. Make sure the High School leader and teach are prepared and ready to lead this station, or help them out on the first rotation if they are not confident. Many people are attracted to climbing rocks, but it can be a dangerous hobby. It is for this reason that technical rock climbing utilizes ropes, carabiners, and harnesses to ensure safety. We cannot stress it enough: climbing rocks without protection is very dangerous.

Rock scrambling differs from rock climbing because, other than a spotter, ropes and protection are not used or needed because the location is less demanding and dangerous. That is why it is important to set goals that can be accomplished in a safe way when rock scrambling; maybe the challenge should not be to scale a 30 foot wall, because, chances are, you cannot be spotted by your partner! Instead, why not see if you can get across the 40-foot wide wall, at a height where your partner can assist you! Communication about these goals and the practical interaction of the group can make this very exciting and challenging.

Rock scrambling has the potential to be one of the most fun and satisfying activities on trips. It also has the potential to be very damaging to self-confidence and the body. Good leadership is crucial.

Rules of rock scrambling:

- Never go alone.**
- Never attempt climbs with exposure greater than two or three feet.**
- Cover safety precautions and climbing techniques before you begin to climb.**
- A leader should be in front at all times. Another leader should bring up the rear.**
- Extra adults should be spread among the group.**
- If there is a question about the safety of a rock scrambling location, do not attempt it.**

Spotting rules:

- Protect the head and spine of the scrambler, as these are the most crucial and vulnerable parts of the body.
- Do not let the scrambler get above your head; even a short fall can be enough to knock you off balance, causing both of you to fall.
- The scrambler should alarm the spotter in case of a fall. Communicate with your spotter. Check to be sure that both of you are ready before climbing.
- Position is very important. Make sure there is room to spot the climber. Next, the spotter should stand with arms and legs slightly bent, with one foot in front of the other. Basically, you want to anticipate a fall by having good balance yourself. Plan to catch the head and upper back on your shoulder and chest and roll with the climber to the ground to break the fall if necessary.
- Have someone spot you! Never rock scramble alone!

Rock Scrambling Techniques

- Three point rule: On steep rock keep three points secure on the rock at all times (both feet and one hand or both hands and one foot). With the other hand or foot you can then search for a new hold before moving on.
- Stand upright, with your weight over your feet. Do not lean into a slab or your feet could slip out from under you.
- Learn the adhering quality of your soles. With practice, you will learn to trust them as you place your body weight onto them.
- Whenever possible, test your next hold with a tug before shifting your weight to it. Some of our granite crumbles easily.
- Beware of the beginner's tendency to grab for holds too far above their reach.
- Arms should not be relied on too much; you should raise your body with your legs and feet. Think about how you climb a ladder: legs move you up, and hands keep you on.
- Remember that coming down is generally more difficult than going up. Will you be able to get back down? A good rule is: If it is an easy descent, face out; if moderate, face sideways; if difficult, face into the rock using 3 points of contact.
- Careful! Vegetation is not a hold! Grass, trees, and roots can easily pull out of the rock.
- Have someone spot you! Never rock scramble alone!

Check in with the High Trails Director if you are unsure about leading and running the Rock Scrambling station!

Leave No Trace

- Objectives:** 1. Appraise the value of the 7 Principles of LNT.
2. Understand why we should think about conservation of undeveloped and wild areas.

Time: 15 minutes

A group discussion of the Leave No Trace Principles is a great way to wrap up the Discovery Group, and can help bring it all together for students. Plan on at least 15 minutes to talk about the LNT principles, how they are related to what was just learned, and why they are important. This discussion will help the group understand the responsibilities of stewardship and care of public resources, and will lead directly into a good conclusion.

The 7 Principles of LNT:

1. Plan ahead and prepare
2. Travel and camp on durable surfaces
3. Dispose of waste properly
4. Leave what you find
5. Minimize campfire impacts
6. Respect wildlife
7. Be considerate to other Visitors

Describing the Principles...

Each of these principles has a number of sub-points – the full list can be found in the Resources section. Show the students the above list of the 7 principles, and ask them to try to identify which one you are describing as you read out the sub-points from the Resources section and use the “what principle am I” activity below.

Questions to Ask

-Which principles have already been part of our Discovery Group today?

‘Plan ahead and prepare,’ the first and most important principle, is the focus of our discussion of gear, orientation, and survival. If we thoroughly plan and prepare, we should be ready to deal with any situation that arises while on our trip.

-Who might have come up with this list, and why?

Other mountaineers and explorers such as us, who became concerned when they witnessed the wild places they loved becoming trampled and trashed by other people.

-How will you apply LNT to your day-to-day life?

-What other ideas do you have to add to each LNT principle?

If you have time, or during the all-day, a fun way to initiate more interactive thinking about LNT is to have students act out the principles in small groups. Give each Summit team one principle, including the sub-points, and give them 5 minutes to plan a short skit showing positive or negative examples of this principle. At the end of each skit, the other groups will be challenged to guess which LNT point was demonstrated.

Another resource students find interesting is the “Litter over time” activity, which can be found in the Resources. Students get an idea of how long it takes for common items to decompose after being thrown out.

What LNT principle am I? Clues....

-I treat living plants with respect.
-I take pictures of flowers instead of picking them.
-I don't bring home anything I've found when exploring outside.
-I leave things as I found them.
What principle am I? ...
Leave what you find.

-If I have to go to the bathroom, I do it away from water at least 200 feet.
-If I pack it in, I pack it out.
-I don't leave any trash or litter, not even crumbs.
-If my dog is with me, I pack his waste out too.
What principle am I? ...
Dispose of waste properly.

-I use stoves for cooking.
-I only use loose sticks from the ground.
-I don't burn trash or food.
-I check to make sure it is ok to have a fire, and only start one in a pre-made fire ring.
What principle am I? ...
Minimize campfire impacts.

-My time outdoors shouldn't bother anyone else.
-I share trails with other users I meet.
-I step aside to let people on horses pass me.
-I don't yell or make loud noises.
What principle am I? ...
Be considerate to other visitors.

-I stay on the trail, even if it's muddy.
-I walk on snow, rocks, or the trail instead of vegetation.
-I set up camp 200 feet from any water sources.
-I use pre-established trails and campsites instead of creating new ones.
What principle am I? ...
Travel and camp on durable surfaces.

-I control my pet if I brought one.
-I store my food and trash in a safe spot.
-I never feed, follow, or chase wild animals.
-I don't do anything that makes an animal move or run away.
What principle am I? ...
Respect wildlife.

Conclusion

As a final discussion, ask students what they have learned, and how it can be applied to their normal lives. *Will they be able to use this information as they explore around town? Is anyone going to ask their family to go on a camping trip?*

Have each group look back at their initial list of gear they considered essential for survival. *Are there any changes you would like to make? What did you think you needed that you could survive without? What are the most and least important items?*

Finally, *why are we worried about our impact, and about how we conduct ourselves while outside?* It helps provide a safe experience for us while we explore and leaves opportunities for others to experience what we have enjoyed while outside. It also shows our respect for the unpredictability of the wilderness, and ensures that we will plan and prepare for anything to happen, as we can do in our everyday lives.

Mountaineers All-Day

The all-day is a great opportunity to teach the Mountaineering principles in a more in-depth and hands-on manner. The most effective method for a successful day is to create energy and excitement by teaching students about the different aspects of setting up, living in, and managing a campsite. These can include campsite selection, tent set-up, fire building, water treatment, food storage, and in-depth discussion of the individual principles of LNT.

As opposed to other discovery groups, it can be successful to begin the all-day with this new material, and teach the half-day topics in the afternoon, after going through campsite set-up. With such a variety of material to cover, it can be best to utilize small counselor-led groups to teach campsite set-up, and rotate students through stations as you do on the half-day. Group challenges are also a great way to keep students engaged. Races to set up a tent or shelter, start a fire and boil water, or set up a bear hang can all be successful activities. Refer to 'Backcountry Basics' for more in-depth information on each topic. Good spots to host the All-Day are the Aspen Campfire and Beyond A-Bluff.

Campsite Selection

... a good introduction to the whole group to start off the campsite set-up section of the day.

Questions to think about:

What are some key things to think about when choosing a campsite?

Proximity to water, cover from storms, size, previous impact level, and a variety of other considerations

Picking a Site

- Set up tents 200 feet away from all water, trails, and your kitchen site
- Choose sites based on this order of impact: most impacted, un-impacted, slightly impacted. Sites with only slight impact will have a good chance to recover – try not to further impact them.
- Ideal campsites could have a good flat spot for tents, provide protection from the wind, have early morning and late evening sun, and provide shade through the hot part of the day.

For Safety

- Avoid flood zones, drainage, runoff areas, overhanging limbs, and dead trees.
- Avoid high ridges and places where lightning can strike. The tops of hills or open valleys are dangerous due to higher chance of lightning.
- Trees provide the best cover from lightning, as long as they are at the same height. Uniform groves of trees provide the safest cover, while tall trees standing alone attract strikes.

At this point, you can have students break back into their Summit teams, and rotate through stations:

Tents, Water, Fire

Tents:

Setting up a tent is a significant challenge for many students. Make sure the tent you bring has all necessary parts, and give students support. Adding a competitive factor by timing student groups can be fun, or stressful, be sure to read your group energy. Celebrate a successful basecamp setup!

Water Treatment

People can do without food for weeks, but without water a human can only survive for about three days. Staying hydrated is one of the most important tasks for a group living in the outdoors. In addition, if you do not treat your water to clean it, you risk drinking dangerous microbes that can cause diarrhea and vomiting. This can cause you to become more dehydrated than not drinking in the first place – a severe risk.

Giardia is a microscopic parasite that pollutes water. It inhabits the intestines of affected wildlife and humans. This parasite is transmitted through the feces, so when an infected animal defecates near a stream or water source, it can become contaminated. Here are the most tried and true ways to purify your water in the wilderness:

1. *Iodine*: Adding iodine to your water will kill the parasite if done properly. Follow instructions on the bottle, letting the iodine dissolve in your water for the correct amount of time. Also, make sure that the iodine can get in the threads of your bottle, by letting some of the mixture leak through the threads as it dissolves. Adding drink mixes or flavors can take away the weird taste of the chemical.
2. *Filters*: Using a water filter or purifier is another option. A pump filter strains the water as it is pumped through the filter. UV purifiers fire a dose of UV radiation into the water-enough to kill bacteria but not to harm humans.
3. *Boiling*: The traditional method. Water should be brought to a rolling boil for 5 minutes before being

Firebuilding

Fire Rings: When you are in an area with pre-existing fire rings, use the largest, most prominent one. Disassemble all of the smaller, satellite rings so future use will be at one site instead of several.

Gathering Wood:

- Collect wood that is DEAD & DOWN only.
- Gather wood at least 300 feet away from the campsite to avoid stripping the area.
- Collect tinder as a fire starter. This is the very smallest, dry, and easily burnable material, such as dry pine needles, dead grass, or bark shavings.
- Prepare wood of different sizes prior to starting the fire, so you don't have to leave to get it. After starting the tinder, you will use pencil size, then finger size, then wrist size.
- Do not use wood bigger than wrist size – it will not burn down completely to ash.

Starting the Fire:

- Arrange kindling (pencil size and smaller), around tinder allowing air to circulate.
- Light tinder and use directed blowing to start fire. Gradually feed the fire as it grows, being careful not to bump your structure over.

If possible, use an existing fire ring, as at Aspen Campfire or Beyond A-Bluff, and allow the group to gather and attempt to start a small fire. Give each group only one match as a challenge!

Stoves: Bring examples of each to demonstrate.

There are two common kinds of camp stoves. The first uses a refillable canister, which requires you to pressurize it before each use. This gives the advantage of being able to adjust the pressure with a pump, useful at higher altitudes or in cold weather. In addition, it reduces waste. The second stove type uses a pre-pressurized, disposable fuel canister, which is easy to set up and use, and has almost no parts to take care of. However, there is no way to refill the canister once it is empty, and it must be packed out and disposed of.

Further All-Day Activities:

There are a few other good activities to include, which can either be part of the rotation or used as a final challenge after the rotation schedule.

Storing Food and Bear Bags

Discussion of how to store food at night and while out of camp, and a race to make a bear hang. If you make this a competition, be sure to have the necessary supplies for each group to create their own bear hang, and define the requirements for successful completion. Also, keep safety a focus, as groups will likely be throwing objects with ropes into the trees. Aspens do not work well, as their branches break easily.

No Tent? Try a tarp shelter!

Rope and tarp shelter building race. Once again, be sure to have enough supplies for each group, and define the objectives so that students have a clear idea of what to try to build.

Team building challenge:

Refer to the Resources section for two appropriate team building exercises.

Resources

FAMOUS MOUNTAINEERS

Sir Edmund Hilary

He and his guide Tenzing Norgay were the first humans to summit the highest point in the world, Mt. Everest (29,028 ft.) in the year 1953. Hilary was a New Zealand bee farmer who explored and adventured across the world during his life. His ascent required an immense amount of preparation and support, including a team of over 350 sherpas, who carried the group's supplies – over 10,000 pounds. After establishing many camps up the side of the mountain, Hilary and Norgay summited, spending only 15 minutes on top. Hilary was knighted by Queen Elizabeth and later started a successful foundation to aid native Nepalese people in building homes and schools. He continued to lead an overland voyage to the South Pole, and led expeditions to the source of the Yangtze River in China and the Ganges River in India.

Julia Holmes

In 1858, when Julia Holmes became the first woman on record to reach the summit of Pike's Peak, she did so wearing bloomers, a short dress, and moccasins, and called the outfit her "American costume." Julia, her husband, and two others began their trek up the high peak in Colorado on August 1. Four days later, they had reached the top of the mountain, 14,110 feet high. Holmes, one of the first women's rights activists in the West, sought to promote equality between men and women, and wanted to show what a woman was capable of. Later, when asked what her biggest challenge had been, she replied, "I have accomplished the task which I marked out for myself...Nearly everyone tried to discourage me from attempting it, but I believed that I should succeed." In the face of challenging odds, Holmes pushed the boundaries of what people believed women could do.

John Wesley Powell

His surveying party were the first to summit Longs Peak in 1868. Powell was a US soldier who lost his left arm to a 'Minie-Ball' during the Civil War, and a scientist who was the first to successfully navigate the dangerous canyons and rapids of the Colorado River in a boat of his own design. His famous "armchair boat" was a simple wooden craft with his desk chair rudely tied down in the center with attached oar-locks. His team was the first to pass through the Grand Canyon. Lake Powell in Utah is named after him. His goal was to map the region and collect rock, plant, and animal specimens for the US government. He could often be seen free-climbing 80 foot cliff walls with one arm to investigate an interesting specimen. As a leader of many expeditions and a war hero, Powell is a proven leader and inspiration to his men. What character traits does he possess?

Lynn Hill

A modern-day pioneer of rock climbing, Lynn Hill pushed the limits of the sport as one of the best climbers in the world during the 1980s and 1990s. She grew up in Southern California in the early 1980s, living at Yosemite National Park and climbing the big walls of its valley. She traveled over the world, establishing and climbing some of the hardest routes around. From 1986-1992, she competed in world climbing competitions, winning over 30 international titles. Most significantly, she achieved one of the most impressive achievements in all of climbing history as the first person, male or female, to free climb 'The Nose,' a famous 3,000 ft. route in the Yosemite Valley. Her feat went unrepeatable for 10 more years, a testament to her skills and pioneering abilities. She now teaches kids how to climb at a number of summer rock climbing camps across the country.

Roger 'Sandy' Sanborn

Sandy and Laura Sanborn started High Trails in 1967. They are different types of mountaineers. They believe that the hike and what you experience along the way, with friends and about the Earth, is much more important than making it to the summit. Sandy was part of the 10th Mountain Division Ski Patrol, a World War II Army battalion that trained in the mountains of Colorado near Leadville before going to Europe to fight. They were an elite group who learned mountaineering skills and lived without tents during cold winters at high elevation. After the war, Sandy and Laura bought land in Florissant and started a camp dedicated to helping people get along in a peaceful way, while other members of the 10th went on to develop Vail, Aspen and Nike. They bought 480 acres of land with a house that was falling down, and set up their tent to fix the place up. They were modern homesteaders, relying on their own skills and motivation to develop a place that had real meaning.

The 7 Principles of LNT

1. Plan ahead and prepare

- Know the regulations and special concerns for the area you'll visit.
- Prepare for extreme weather, hazards, and emergencies.
- Schedule your trip to avoid times of high use.
- Visit in small groups when possible. Consider splitting larger groups into smaller groups.
- Repackage food to minimize waste.
- Use a map and compass to eliminate the use of marking paint, rock cairns, or flagging.

2. Travel and camp on durable surfaces

- Durable surfaces include established trails and campsites, rock, gravel, dry grasses, or snow.
- Protect riparian areas by camping at least 200 feet from lakes and streams.
- Good campsites are found, not made. Altering a site is not necessary.

In popular areas:

- Concentrate use on existing trails and campsites.
- Walk single file in the middle of the trail, even when wet or muddy.
- Keep campsites small. Focus activity in areas where vegetation is absent.

In pristine areas:

- Disperse use to prevent the creation of campsites and trails.
- Avoid places where impacts are just beginning.

3. Dispose of waste properly

- Pack it in, pack it out. Inspect your campsite and rest areas for trash or spilled foods. Pack out all trash, leftover food, and litter.
- Deposit solid human waste in catholes dug 6 to 8 inches deep at least 200 feet from water, camp, and trails. Cover and disguise the cathole when finished.
- Pack out toilet paper and hygiene products.
- To wash yourself or your dishes, carry water 200 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.

4. Leave what you find

- Preserve the past: examine, but do not touch, cultural or historic structures and artifacts.
- Leave rocks, plants, and other natural objects as you find them.
- Avoid introducing or transporting non-native species.
- Do not build structures, furniture, or dig trenches.

5. Minimize campfire impacts

- Campfires can cause lasting impacts to the backcountry. Use a lightweight stove for cooking and enjoy a candle lantern for light.
- Where fires are permitted, use established fire rings, fire pans, or mound fires.
- Keep fires small. Only use sticks from the ground that can be broken by hand.
- Burn all wood and coals to ash, put out campfires completely, then scatter cool ashes.

6. Respect wildlife

- Observe wildlife from a distance. Do not follow or approach them.
- Never feed animals. Feeding wildlife damages their health, alters natural behaviors, and exposes them to predators and other dangers.
- Protect wildlife and your food by storing rations and trash securely.
- Control pets at all times, or leave them at home.
- Avoid wildlife during sensitive times: mating, nesting, raising young, or winter.

7. Be considerate of other visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail.
- Step to the downhill side of the trail when encountering pack stock.
- Take breaks and camp away from trails and other visitors.
- Let nature's sounds prevail. Avoid loud voices and noises.



Litter Over Time

Consumption – we all consume, and it’s not a bad thing. However, we need to become more conscious of our personal impact on the Earth. It’s the only one we have.

The 3 R’s – Reduce, Reuse, and Recycle, can help to guide our decisions as we consume and dispose of our stuff. Unfortunately, many of the things we use or get rid of every day will be around long after we are. The following list will give students an idea of how their choices affect the planet.

Litter	Time Required to Decompose
Apple core	2 Months
Notebook paper	3 Months
Wool mitten	1 Year
Cigarette butts	5 Years
Plastic grocery bag	15 Years
Baseball bat	20 Years
Baseball glove	40 Years
Steel can	100 Years
Aluminum can	350 Years
Zip-lock bag	400 Years
Plastic bottle	450 Years
Six-pack ring	450 Years
Styrofoam cup	Never
Glass bottle	Never
Car tire	Never

TEAMBUILDING ACTIVITIES

Blizzard Conditions

Materials: 30 foot rope, tied into a loop, blindfolds for each student

Objective: demonstrate your ability to effectively execute as a team in the harshest of conditions by making a perfect square out of the rope.

Rules: You may slide back and forth on the rope but you cannot let go of it with either hand.

You cannot pass anyone.

You should choose a team leader, who will let the staff person know when the group decides it has formed a perfect square.

Prompt: You have arrived safely at a rendezvous point only to find yourselves immersed in blizzard conditions. It is impossible to see, but fortunately you have a large rope that everyone can hold onto so no one gets lost. From your Mountaineers training, you know that creating a perfect square offers your team the best chance of survival in this harsh environment.

Debrief: When you have completed the task, review the group's performance. Debriefing is the most important part of the challenge. Refer to the introductory pages of the Teambuilding curriculum for detailed guidelines on successful debriefing.

Was this task easy or hard? Why?

How did you communicate?

How did you know what shape you were in?

What did you notice?

How can this exercise be applied to school or family life?

The Icy River

This is a more in-depth activity, with specific location, materials, and challenges. Please talk to the High Trails Director if you are interested in leading the Icy River during your all day. This activity can take more time, especially with younger students. Allow up to an hour or more.

Materials: piece of rope, 3 wooden planks, and Icy River course (available at a number of spots around High Trails). The planks are constructed at a specific length for the course, so make sure you do not just grab 3 random boards.

Objective: Get the entire team safely to the other side of the river without falling in.

Rules:

Nothing can touch the river-students or materials-or terrible consequences will result.

River rocks cannot be moved.

No jumping is allowed.

Prompt: You have arrived at a raging icy river and must cross to the other side. The only equipment available to you is three wooden planks, a piece of rope, and your own talent. There are rocks protruding from the water, which you must use to support the beams and travel across the river.

Debrief: If the activity takes time, you may be short on debriefing time. Celebrate the group's success – this is a very challenging activity, and can be frustrating for a bigger group, so congratulate them on a job well done. Follow the general rules for debriefing found in the teambuilding discovery group field guide.