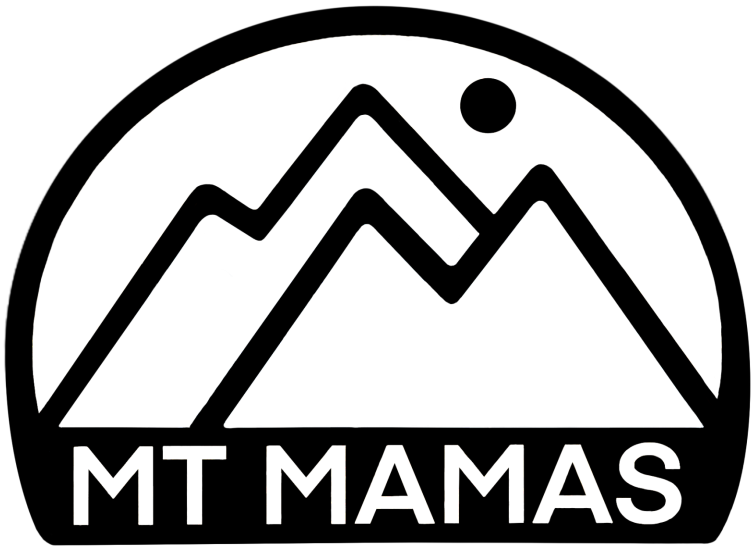


Caving Manual

Caving

TRIP LEADER REQUIREMENTS

- **Assistant Trip Leader** – 1 horizontal cave (non-commercial/wild) in the last 3 yrs; Understand Cave Etiquette; SRT Level 1 (vertical caves); First Aid/CPR certified
    - Provides instruction for safety on hike and through cave including signs and symptoms of hypo/hyperthermia, dehydration, and claustrophobia
    - Assists in fitting and checking gear and participants for safety
    - Carries first aid kit and administers basic first aid if needed - can be designated Medic Guide
    - Carries 2-way radio for communication
    - Wears Trip Leader handkerchief to identify as a Trip Leader
    - Wears whistle to communicate in emergencies
- **Lead Trip Leader** – Serving as main Trip Leader of the group; Been in 4 wild caves; Able to set up hand lines (see Appendix J) and rappels safely; Completed SRT Level 2 training (vertical caves); 20 hrs leading trips in caves; Wilderness First Responder Certified
    - Recons area for activity within 1-2 months prior to activity or in same season
    - Completes Trip Report prior to and after activity
    - Checks gear for safety prior to activity
    - Checks participants for safety and leads safety discussion
    - Carries first aid kit if not designated to Assistant Trip Leader
    - Carries 2-way radio for communication (if needed on approach)
    - Able to use GPS navigation or map and compass to navigate to and from cave
    - Sets up rappels or hand lines if needed in cave
    - Wears Trip Leader handkerchief to identify as a Trip Leader
    - Wears whistle to communicate in emergencies
    - Communicates with Base Commander at the beginning, middle and end of activity via phone or In Reach Beacon
    - Completes Incident Report and/or SOAP Note if any concerning situation occurs on activity
    - Reports any damaged gear or safety concerns from trip

Caving - Activity Plan

PRIOR TO ACTIVITY

GEAR

- **Provided by Mt Mamas:**
    - First Aid Kit per activity
    - Whistle per Guide
    - 2-way radios
    - Emergency Beacon (if needed)
    - Ropes or hand lines (if needed to access cave)
    - Anchor systems, rope and belaying/rappelling gear (vertical caves)
    - 2 sets of ascension gear (vertical caves)
    - Bleach spray bottle
- **Provided by Participants:**
    - Helmet
    - Headlamp with spare batteries
    - Extra headlamps or flashlights with spare batteries (3 sources of light total with spare batteries)
    - Tshirt (not cotton if in wet caves)
    - Long sleeve shirt (not cotton if in wet caves)
    - Fleece (if cooler cave)
    - Waterproof jacket
    - Coveralls (optional)
    - Thick gloves (leather or rubber latex gardening gloves with texture - NOT cloth)
    - Daypack with few to no straps
    - Knee/elbow pads
    - 1-2 L water in water bottles (NO water bladders)
    - 1 snack per hour on activity
    - Running shoes or boots
    - Face mask or handkerchief
    - Sunscreen (if approach is long)
    - Camera (will get dirty)
    - Personal first aid kit
    - Baby wipes
    - Change of clothes with garbage bag

    - Harness, rappelling, and ascension gear (if needed for vertical caves)
- **Have participants watch:**
    - "Getting Started Caving - Taking Your First Cave Trip" Derek Bristol

POSSIBLE ACTIVITY LOCATIONS

- Goshute Cave, NV (Intro Clinic - Horizontal)
- Crystal Cave, UT (Intermediate - Horizontal)
- Lehman Caves, UT (Intro Clinic - Guided Tour - Horizontal)
- Timpanogos Cave, UT (Intro to Caving Tour - Guided Tour - Horizontal)
- Crystal Ball Cave, UT (Intro Clinic - Horizontal)
- Spanish Moss, UT (Intro Clinic - Vertical)

INDIVIDUAL DEFINITIONS

- **Participant** – Individual participating in activity
    - Notify Mt Mamas of any health concerns or injuries prior to activity
    - Report if activity appears too strenuous or difficult
- **Assistant Trip Leader** – Assists Lead Trip Leader with activity
- **Lead Trip Leader** – Leads activity with Assistant Trip Leader (if needed due to group size)
- **Sweeper Trip Leader** - Last Trip Leader in the group (usually the Assistant Trip Leader)
    - Makes sure all participants make it through activity safely
    - Carries 2-way radio for communication with Lead Trip Leader (during hike in and out)
- **Medic Trip Leader** – Trip Leader designated per activity with first aid/CPR certification
    - Main Trip Leader in charge of minor accidents or injuries
    - Designated Trip Leader to stay with injured individual if case of evacuation
    - Last in group and will assist any in the back of the group with any concerns
    - Carries 2-way radio for communication (during hike in and out)
- **Base Commander** – Individual not participating in activity that Trip Leader Guide is to report to prior to before, during and after activity of safe completion of activity.
    - Will notify emergency contacts and/or Search and Rescue if group is late or lost

BEGINNING ACTIVITY

SAFE GEAR (GEAR CHECK)

- Check Mt Mama gear for safety: first aid kit, 2-way radios, emergency Beacon (if needed)
- Check Participants gear for safety - helmets, headlamps/flashlights, knee/elbow pads, harness/rappel/ascension gear (vertical caves)
    - Gear
        - Helmets - fits snugly - have look up, down and shake side to side
        - Headlamps - attached securely to helmet (can use duct tape if needed)
        - Harness - doubled back, not fraying (vertical caves)
        - Rappel device/locking carabiner (vertical caves)
        - Ascension system - make sure it is complete (vertical caves)
    - Trip Leaders are NOT required or responsible to size or fix broken gear - participants should ensure gear is safe and sized correctly prior to activity
    - Trip Leaders can refuse participation of any Participant if gear is determined to be unsafe.
- Trip Leaders can demonstrate how to adjust gear
    - Helmets - can change positions of side tabs to move attachment more to the front or back for comfort; adjustments for size are usually in the back

SAFE PARTICIPANTS

- Trip Leader to Participant Ratio 1:6
- Check Participants for safety: appropriate clothing, appropriate health, appropriate gear

SAFETY TALK

- **Circle Up -** when participants arrive, gather them together in a circle and have them share 3 things:
    - Name
    - Experience in the activity
    - Goal for the activity
- **Safety talk:** describe the activity and safety items for participants to be aware of (5 items):
    - Environment – weather, cave conditions, trail conditions, location, distance, route, time expected, bathrooms/cell phone service

- Gear – what gear we will be using and how to use it
  - Helmets/headlamps (see Appendix A)
  - Rappelling - Harnesses, Rappelling devices (vertical caves - see Appendix B)
  - Ascending gear (vertical caves) (see Appendix C)
- People – sunscreen/hat/sunglasses, food/water, appropriate clothing
  - Clothing -
    - Layers (thin synthetic base layer, insulating down or fleece layer, water proof shell - see Appendix D)
    - Clean shoes/boots with bleach spray prior to and leaving the activity (White Nose Syndrome - see Appendix E)
    - Wear helmets/gloves at all times in the cave
    - Wear masks/handkerchiefs over face if dust is present
  - Rule of 3's
    - Always have 3 sources of light in a cave
    - Always have 3 points of contact when climbing or scrambling
    - Always explore caves with 3 or more people
  - Cave Etiquette
    - Don't shine lights directly at bats if found.
    - Do not remove any cave formations from the cave or historical items
    - Don't graffiti in caves
    - Don't leave trash/food in the cave
    - Don't go into a cave without a map or guide
    - Don't explore pits without training (SRT - Single Rope Technique Training from Timpanogos Grotto - See Appendix F)
    - Don't explore mines as they are unstable and may have hazardous chemicals
    - Bathroom needs in the cave - bottles for pee/WAG bags for poop (if participants will be in cave for more than several hours)
- Dangers – describe any dangers that could occur
  - Mountain Safety - Rapid weather changes, hazards along the route (rock slides, river crossings, cliffs, wrong turns, etc)
  - Cave Conditions - wet, pits, narrow areas, small passages, dust
  - Running out of light - always have 3 sources of light
  - Hypothermia - caves are usually 50-60 degrees, but if wet or cold cave wear wet or dry suits, use dry bag (see Appendix G)

        - Claustrophobia - describe smallest areas in the cave and duration and if they are mandatory, never go into an area where you have to remove your helmet, always go in small spaces feet first
        - Getting lost - always have a map and go with someone who has been before, use twine, rope or reflective tape to mark way out NOT spray paint
        - Falling/Injuries - always go in groups, bring first aid kit, let base commander know where we are
        - Hantavirus - The black tar/small poops generally found in the entrances of caves are from Pack Rats and there is a risk for hantavirus if inhaled (wear masks)
    - Safety – what you will be doing to mitigate those dangers (see above)
        - Keep group together with least experienced near the beginning of the group

CAVING LESSON (PROGRESSION) - Trip Leaders can use their own discretion to determine which drills and skills would best meet the goals of the Participants. A progression is a series of steps that logically build on one another, increase in difficulty, and are focused specifically on participants. There are always several ways to teach a lesson. Every Participant needs different things, some will need to spend time on a skill and others can skip ones.

- Teaching Tips
    - Trip Leader Body Language
        - Posture - relaxed, stand and face them
        - Hand Gestures - waving, thumbs up, hand shakes or high fives
        - Facial Expressions and Eye Contact - make eye contact, smile
    - Teaching Theory
        - Understand the Teaching/Learning Cycle (see Appendix I)
        - Understand Different Learning Styles (see Appendix J)
- Choose which skills would be appropriate for your group in the selections below

IN THE CAVE (choose which skills or information would be appropriate for your group)

- **Cave Formations -** (Speleotherms) – formed when calcium carbonate in the rock is deposited inside the cavern.

- Types
  - Stalagtites (hang “tight” to the ceiling)
    - Halectites (defy gravity)
    - Bacon (long strips along seams)
    - Mammilaries (large, white bumps on ceiling - Goshute Cave)
    - Shields
    - Boxwork
    - Popcorn
    - Drapery
    - Flow Stone
    - Soda Straws
  - Stalagmites (on the bottom – might trip over them)
    - Dogs Tooth Crystal Balls (Crystal Ball Cave)
    - Columns
  - Water
    - Calcite Rafts
    - Rim pools
  - Other
    - Cave Cones (formed from stacked calcite rafts)

- **Cave Wildlife**
  - Troglobites – live ONLY in caves
    - Cave Crickets - humped back, no wings, no color (Camel/Cave Cricket)
    - Cave Beetles - strong sense of touch and long feelers, eyeless, flightless, no color
    - Cave Salamanders - little or no eyes, no color
    - Cave Fish - found in 6 continents, small eyes, eats little
  - Troglophiles – live ONLY in caves but can occur in other environments
  - Trogloxenes – live SOME of their lives in caves
    - Bats (see below)
    - Pack Rats - most of the poop/pee in caves (Bushy-Tailed Wood Rat)
    - Great Basin Rattlesnake - lives in mouths of caves, hybernates in the winter
  - Accidentals – found themselves in caves by accident

- **Bats**
  - Bats hibernate late Oct to April (other months they are just sleeping)
  - They are more sensitive to disturbances when in a larger group
  - 18 species in Utah
    - Big Free-Tailed Bat – biggest bat with wingspan of 17 inches; has tail beyond wings

  - Little Brown Myotis – lives in caves, trees and buildings; most common

  - Townsend's Big-Eared Bat – great at echolocation and catching moths; large ears

  - Western Pipistrelle – smallest bat, size of a hummingbird; tan body

- **Types of Caves**
    - Solution Caves (soluble rock dissolved by acid – formations form over time)
        - Most caves are solution caves or limestone caves, called after the common type of rock they dissolve to form
        - Can also form in chalk, dolomite, marble, salt, gypsum
        - Rock is dissolved from natural acid (carbonic acid) that occurs in ground water that seeps through cracks, faults or joints in the rock below.
        - Over time, cracks can form into large caverns
        - The dissolution can form Karst, characterized by sinkholes and underground drainages (Warm Springs, UT)
    - Primary Caves (formations formed at the same time as the surrounding rock)
    - Lava Tubes - Formed through volcanic activity and are the most common primary caves. As lava flows downhill, its surface cools and solidifies. Hot liquid lava continues to flow under that crust, and if most of it flows out, a hollow tube remains. (National Cave Association)
    - Tectonic Caves - Formed in cracks created during fault shifts
    - Corrasional Caves - Form entirely by erosion by flowing streams carrying rocks and other sediments.
    - Sea (Littoral) Caves - Found along coasts around the world. A special case is littoral caves, which are formed by wave action in zones of weakness in sea cliffs. Often these weaknesses are faults, but they may also be dykes or bedding-plane contacts. Some wave-cut caves are now above sea level because of later uplift.
    - Talus Caves - Formed when rocks fall usually in a narrow canyon and water washes away the sediment beneath
    - Ice Caves - Formed in rock that contain ice all year-round are referred to as Ice Caves. These caves may contain very large ice formations on the floors, walls, and ceilings of the cave
    - Glacier Caves - Meltwater moving through glaciers forms this type of ice cave.

- **Water**
    - Some rappels have water at the bottom. If this is noted, the Lead Trip Leader will determine safety of water and alternate routes if needed.

- If water is unavoidable, Lead Trip Leader or Assistant Trip Leader will rappel first and recon depth of water.
- Trip Leader will notify group of depth and assist with rappels from below as needed.
- Participants may need to swim in some sections if water is more than chest deep. Remove backpack and push in front, while swimming to shore.
- Trip Leaders to monitor Participants closely for hyperthermia. Wet or Dry Suits will be worn if any chance of water is suspected.

- **Rappelling Demonstration**
  - **Tying in** – The Participant will clip into anchor system via PAS (personal anchor system or sling and carabiner) when close to the rappel station. Trip Leader will assist Participant in putting rope on rappel device safely and setting up top belay (REQUIRED for new rappellers or anyone the Trip Leader feels needs additional support).
  - **Top Belay** - The Lead Trip Leader attaches belay device (figure 8, Munter hitch, ATC) to anchor and then is anchored to the rappel station anchor themselves. Can attach a second belay device to Lead Trip Leader if needed for extra support on belay.
  - **Fireman (Bottom) Belay** - For additional security, ALL Participants must have a fireman belay. The Fireman Belay is provided by the Assistant Trip Leader or managed by the Assistant Trip Leader once Participants are taught how to perform safely. The Fireman Belay holds the rope and pulls if the participant is descending too quickly. Rope should be straight from belayer to rappeller with a little “wiggle” in the rope.
  - **CRASH Safety Check** - Before climbing, the Lead Trip Leader and Participant must perform a safety check of all critical points.
    - Carabiner → Squeeze the carabiner to ensure the gate is locked
    - Rope → Check that the rope is tied correctly into the climber’s harness, running freely to the masterpoint of the anchor & oriented correctly through the belay device
    - Attitude → Assess the team’s mental readiness for the climb
    - Shoes & Stuff → Check for any extraneous stuff on the climber that should be removed. Check that they are wearing properly fitted climbing shoes.
    - Harness & Helmet → Check that all harnesses are secure and correctly buckled. Check that helmets are on and correctly fitted. Hair tied back.
  - **Belayer-Participant Commands:** (using walkie talkies)
    - **Before rappelling** –

        - "Belay On?" asked by Participant after they are attached to rappel device and clipped into anchor system.
        - "Belay On" from Belayer when they are on belay. Trip Leader or Participant unclips from anchor system.
        - "Rappelling" from Participant when ready to rappel.
        - "Rappel On" from Belayer when ready to assist in belaying as Participant rappels.
    - **While rappelling** - the following commands can be called by rappeler if needed from belayer: "Take" - for a tighter rope. "Slack" - for a looser rope.
    - **After rappelling** – when rappeler is on the ground safely, rappeler yells
        - "Belay Off" - from Participant when rappeler is on the ground safely.
        - "Off Belay" from Belayer (2-way radios may be needed to communicate this for long rappels or rappels with noise) Participant removes rope from rappel device. Lead Trip Leader (on top) pulls up top belay rope for next Participant

- **Ascending (**see Appendix C)
    - Make sure all participants have helmets, harnesses, ascending system and locking carabiner, gloves
    - Check Gear again
        - Helmets - secure
        - Harnesses - doubled back, no fraying
        - Ascension gear working appropriately
    - CRASH Safety Check -
        - Carabiner → Squeeze the carabiner to ensure the gate is locked
        - Rope → Check that the rope is tied correctly into the climber's harness, running freely to the masterpoint of the anchor & oriented correctly through the belay device
        - Attitude → Assess the team's mental readiness for the climb
        - Shoes & Stuff → Check for any extraneous stuff on the climber that should be removed. Check that they are wearing properly fitted climbing shoes.
        - Harness & Helmet → Check that all harnesses are secure and correctly buckled. Check that helmets are on and correctly fitted.
    - Ascension system - Participants put on gear and are checked by Trip Leader

- Trip Leader assists Participant in getting on rope and reviewing ascension techniques
- Participant yells “Off Rope” when they are off at the top of rope section and not on rope.

WRAP UP AND CLOSING

- **Review**
  - Review Lesson - how the days went, clarify any questions
    - Have participants review their trip
    - Focus on positives
  - Review skills - ask questions on new skills acquired
  - Review Goals and Progress - successes and struggles
  - Make a plan for practice at home - discuss skills to work on or upcoming trainings
- **Preview** - what they could learn next
  - Build on new learning
  - Invite them back - look up upcoming trips online

(based on the Professional Ski Instructors Association/American Association of Snowboard Instructors (PSIA/AASI) certification courses "Delivering the Beginner Experience -Alpine" and "Alpine - Level 1")

Risk Management Plan

Caving has large inherent risks. Without good Risk Management it is impossible to create the “safe and joy-filled environment” that Mt Mamas seeks to offer every Participant. Managing risk involves using good judgment to make sound decisions in a dynamic environment. This section contains a general overview of common risk factors on Caving trips as well as an outline of expected practices for activities. Additionally, you will find the Emergency Action Plan detailed step by step on what to do if you are faced with some common injuries while during the activity and also for emergency situations.

Objective Risk Factors exist inherently in the activity itself

Subjective Risk Factors exist as a result of human engagement in the activity

RISK MANAGEMENT PRACTICES

- **Ratios:** Trip Leaders should maintain a **1:6 Lead Trip Leader to Participant ratio** for each caving group and groups can be increased with additional Assistant Trip Leaders to maintain the Trip Leader to Participant ratio.
- **Training:** Mt Mamas requires all Lead and Assistant Trip Leaders to be able to demonstrate proper technique and skills listed at the beginning of this manual.
- **Gear Safety:** Helmets, headlamps, gloves, knee/elbow pads, harnesses/rappelling/ascending gear (vertical caves), etc will be brought by participants and Trip Leaders will assess generally for safety.
- **Gear Inspection:** Trip Leaders will assess gear for safety prior to trip. Trip Leaders are NOT required or responsible to size or fix broken gear - Participants should ensure gear is safe and sized correctly prior to activity. Trip Leaders can refuse participation of any Participant if gear is determined to be unsafe.
- **Planning & Preparation:** Good risk management begins with good planning and preparation. Trip Leaders will select an appropriate activity site and route that takes into account (among other things) expected weather, terrain, temperatures, timing, other users, group size, background, experience, physical condition, and goals for the day. Trip reports, waivers, and checklists will all be utilized online prior to the activity to ensure the group is prepared before each trip. Lead Trip Leader must have completed SRT Level 2 before leading any vertical caving trips.

- **Participant Fitness Level:** Must be able to participate in athletic activity without difficulty. Individuals are responsible to notify Trip Leader PRIOR to the trip if they are not feeling their fitness level is adequate. Participants MUST have completed an SRT Level 1 training from a local grotto (Timpanogos Grotto) prior to doing any vertical caves.

Emergency Action Plan
Caving

PREVENTION

- Trip Leader
    - Trained in First Aid/CPR, completed SRT Level 1 - vertical caves (Assistant Trip Leaders) and Wilderness First Responder/CPR, SRT Level 2 - vertical caves (Lead Trip Leaders)
    - Completes Trip Report prior to activity (office will update medical and emergency contact information on Participants)
    - Carry First Aid Kit at all times during activity
    - Use walkie talkies (one for each Trip Leader for approach)
    - Carry In Reach Beacon (if needed)
    - Check for safe gear, safe participants and have safety chat prior to activity
    - Notify Base Commander of group status and the beginning, middle, and end of activity by phone or beacon
- Base Commander
    - Receive notifications from Trip Leader at the beginning, middle and end of activity
    - Be available during activity to notify emergency contacts of tardiness of group or assist in emergency evacuation or contacting emergency services if needed
- Office
    - Update Trip Report with medical and emergency contact information on participants
    - Email Trip Leader and Base Commander the Trip Report and Emergency Contact and Medical Information prior to activity

LOST OR LATE RETURNING GROUPS

- Prior to activity
    - The Trip Leader will fill out a preliminary **Trip Report** complete with proposed location of activity, possible evacuation routes, and expected times for leaving and returning.
    - Every trip will have a **designated "Late Time"** the the Base Commander will notify emergency contacts of delay.
    - Every trip will have a **designated "Emergency Time"** when the Base Commander will notify Search and Rescue if the Base Commander has not been notified of the safe exit of all participants from activity.
- The Trip Leader can **notify the Base Commander during an activity if the predicted times need to be adjusted**.

INJURIES

- **Minor Injuries:** (minor scrape, sprain, etc.)
    - The designated Medic Trip Leader (generally the rear Assistant Guide or Trip Leader with most medical experience) will administer first aid while the other Trip Leader manages the rest of the group. The affected participant should be kept calm and comfortable. A Trip Leader, or volunteer with medical experience, should remain with the injured participant until they are able to return to the rest of the group. An **Incident Report** should be completed on site if possible or after and signed by both patient and Trip Leader. Take clear **photos** of any wounds or injuries when it is convenient.
- **Major Injuries:**
    - The designated Medic Trip Leader will stay with the participant and assist while the Lead or Assistant Trip Leader manages the rest of the group. The Lead Trip Leader or designated Assistant Trip Leader will make phone calls to the appropriate emergency number below. **An Incident and SOAP Note** should be completed at the time of the event if possible. Take clear **photos** of any wounds or injuries when it is convenient.

COMMUNICATION

- In a Life/Limb Emergency or Property-threatening emergency
    - Try the National Park/State Park/Forest Service/BLM-specific emergency numbers
    - If no park-specific numbers exist, call 911

    - If 911 does not work, use emergency beacon to notify Search and Rescue
- In ALL Emergency Situations, after care has been secured, **notify Base Commander**. If Base Commander is not available, call Emergency Backup Personell (Emily Hacken 801-860-4591) or Marilyn Boucher (801-803-1398). Call each number three times in succession, if no one answers the three phone calls, wait 15 minutes, and move on to the next person.

EVACUATIONS

- If a participant is injured and requires evacuation, follow these procedures based on the situation:
    - The participant can walk - Trip Leaders will assist the participant in walking/skiing/ hiking out.
    - The participant can't walk – Trip leaders will assess if the participants will need to be carried out (if this can be done safely).
    - The participant can't be carried – if due to a possible head/neck injury or other injury, then notify 911 and/or search and rescue.
- Trip Leaders will assess all locations in an activity to determine easy access to vehicles and alternate escape routes prior to activity. Trip Leaders will document this in the Trip Report and discuss this with Participants at the beginning of activity.

Updated:10/21/24

APPENDICES

APPENDIX A

Helmets

Helmets protect our heads from anything that might fall from up above such as rocks or carabiners and also in case we bump our heads on the wall while climbing. Helmets must be worn by everyone at all times within the designated helmet zone. Helmets should be sized and fitted correctly (Helmet size can also be adjusted by twisting the dial located at the back of the helmet. Chin straps should be strapped all times and tightened so the helmet is secure but still comfortable. Check that the helmet is secure by shaking head gently back and forth. If you are going to set a helmet down, make sure to set it with the dome facing up so that it does not roll away.

Headlamps

Headlamps are to be worn at all times in the cave. Most climbing helmets will have 4 small tabs for the band of the headlamp to fit into. If the helmet has no tabs, then duct tape can be used to secure the headlamp on. Participants must bring 3 sources of light (headlamps or flashlights each with extra batteries)

Favorite long-lasting brands: Phoenix, Zebra

APPENDIX B

Harnesses

Harnesses are made from super strong materials and are specially designed to catch us and keep us safe while rock climbing. Loosen the the buckles fully before trying to put the harness on. Step through the leg loops making sure the webbing is not twisted and pull the harness up so the waist strap is above the hip bones. Pull to tighten the waist strap. (It should be tight enough that you are not able to fit more than 2 fingers between your body and the harness). Tighten the leg loops so they are comfortable and not loose. **If the harness has 1 buckle you MUST make sure you feed the webbing back through itself, known as “doubling back”. If the harness has 2 buckles then it automatically doubles back** - make sure the webbing is through both appropriately.

Rappel Devices

Each participant will have their own rappel device and locking carabiner for rappels. Trip Leader will review use of each different rappel device used prior to rappels and double checks participant can safely use.

Approved rappel devices:

- short rappels - Figure 8, ATC'X, ATS, Prana, Sqwrl
    - "Introduction to Rope Decending Devices" Celessense
- long rappels - Petzl Simple, Bobbin, Rack Micro

Ascension Devices

Each Participant will have their own ascension system (Frog System) for ascending vertical caves. Trip Leader will review their understanding and correct use of the system prior to ascending.

APPENDIX C

Ascension System (Frog) - "Frog Ascending System for Caving" Derek Bristol

- Chest harness with ascender (Croll or equivalent)
- Hand ascender with Cow's Tail (3-4 ft dynamic rope with knot attached to locking carabiner and hand ascender above and middle knot attached to D Ring and lower knot available to clip in for emergencies)
- Caving harness with D-Ring carabiner, Simple rappel device and Freino carabiner
- DAFL (detachable, adjustable foot loop)
    - 5-8mm 3-4 ft static rope with foot loop for foot and barrel knot attached to carabiner

APPENDIX D

Clothing

- Summer - cotton can pull heat away from the body if wet, but can still be dangerous if you get cold, thin, light-colored clothing, hats/sunglasses for protection against sun
- Winter - Layers is key, "cotton is rotten"
    - Base layer - (wicks away sweat) synthetic, thin long sleeve layer

- Insulating layer - (insulating) fleece, down, wool
- Shell layer - (weather protection) waterproof jacket - with pit zips for ventilation
- Hat, gloves

APPENDIX E

White Nose Syndrome

A fungal infection affecting hibernating bats and very contagious. The fungus, Pseudogymnoascus destructans (Pd) looks like white fuzz on a bat's face. It makes the bats more active and burn up their fat stores so they don't survive the winter. It was first discovered in the US in 2006. It cannot be spread to humans, but humans can carry the spores on their clothing or boots/shoes. It is most easily spread bat to bat. The fungus has currently killed millions of bats and has a very high mortality rate. The Little Brown Bat in Utah is very susceptible. There is no known cure.

A little brown bat with white-nose syndrome. Credit: Marvin Moriarty/USFWS

Referenced from - https://www.whitenosesyndrome.org/

APPENDIX F

Timpanogos Grotto (timpgrotto.org)

- Local caving group – Exploring and protecting caves since 1974
- Our purpose as the Timpanogos Grotto of the National Speleological Society is **to conserve and protect** caves everywhere, to **explore and survey**, participate in **scientific research**, **protect the ecology** of the cave environment, and provide opportunities for **recreation in a safe and responsible manner**. We also wish to acquaint a new generation of cavers to the old traditions and history of the caves in the intermountain area, while introducing them to the wonders of the underground.
- Meetings – 4th Wed monthly @ Draper Library $25/yr
- Provides SRT Level 1 Training (every 2 months) and SRT Level 2 Training (1-2 times a year) taught by Eric

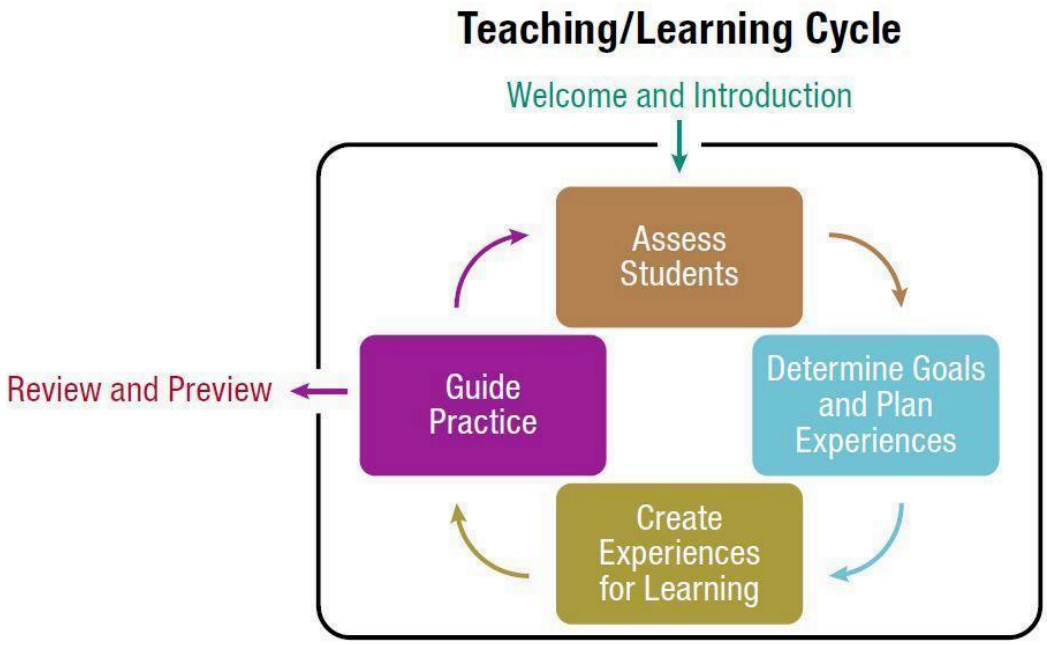
APPENDIX H

Hypothermia – Occurs when the body temperature falls below 95 degrees F; When your body temperature drops, your heart, nervous system and other organs can't work normally. Left untreated, hypothermia can lead to complete failure of your heart and respiratory system and eventually to death.

- **Symptoms:** shivering, exhaustion, confusion, fumbling hands, slurred speech, drowsiness, slowed shallow breathing, loss of consciousness
- **Treatment:** warm individual or area – put handwarmers or hot waterbottle on femoral/groin artery site, armpits; avoid briskly rubbing area in case of frostbite; drink hot drinks; remove wet clothing; wrap in blankets or sleeping bag if available (Adapted from: https://www.mayoclinic.org/diseases-conditions/hypothermia/symptoms-causes/syc-20352682)

APPENDIX I

Teaching/Learning Cycle



- Assess the Student
    - Before you can build a lesson plan for the day, you need to assess your student's physical abilities and technical understanding. Warm-up activities will give you an opportunity to see how comfortable your guests are on snow, while building good group rapport. Observe their movements, stance, balance, and agility.
- Determine Goals and Plan Experiences
    - Ask questions about their goals and motivations for taking a lesson.
    - As the lesson progresses, remember to make sure the group goals align with what each student wants to learn and their motivations for taking a lesson.
- Create Experiences for Learning
    - Organize students and the lesson environment by choosing appropriate terrain based on ability and snow conditions. Interact with support, and encourage your students.
- Guide Practice

    - Create space to spend one-on-one time with each of your students while others practice or explore movements. Repetition of movements anchors the actual learning and sliding experience. Guided practice also lets you handle an ability split. Challenge your more advanced students with difficult tasks while you spend individualized time on guests who may be struggling. This also gives students independence while allowing you individualize the lesson.
- Review and Preview
    - At the end of the lesson, make sure to review the experience, preview the next lesson, and invite your students back to your school and the sport. The debrief is an opportunity for your students to discuss their progress and the goals they accomplished. This content should come from the student. It is your job to facilitate the debrief and make a link to what another day on snow would do for them.

    (Adapted from: “Delivering the Beginner Experience” Course, PSIA/AASI)

APPENDIX J

Different Learning Styles

VAK Model - Learning Preferences - create multisensory lessons (describe a skill, demonstrate a skill, then have them try the skill)

- V - Visual - pictures, images and demonstrations
- A - Auditory - descriptions, talking about experiences
- K - Kinesthetic - process through feelings and experiences

(Adapted from: “Delivering the Beginner Experience” Course, PSIA/AASI)

APPENDIX K

Setting Handlines

- Determine secure anchor point - tree, rock, bolt, etc
- Use a figure 8 follow through (for rope) or a water knot follow through (for webbing) attached to anchor and with tail long enough to reach bottom of traversing area
- Tie alpine butterfly knots for hand/foot holds if needed

Updated 10/21/24