

HOMWORK FOR SECTION I – FUNDAMENTALS

- View Gear and Hygiene lecture video. See [Lecture Videos](#).
- Read *CURRENT SESSION INFORMATION, COURSE OVERVIEW, and SECTION I – FUNDAMENTALS*.
- Prepare for Dry Land Travel Day (Field Day 1).
- Assess your equipment needs; start assembling the Ten Essential Systems.
- Practice knots.
- Complete quizzes below or online and submit to your instructors.
- If Map and Compass are new to you, start *SECTION II – NAVIGATION*.

Senior Instructor: _____ Student: _____

Gear:

- Select the Ten Essential Systems.

<input type="checkbox"/> Navigation	<input type="checkbox"/> Communication
<input type="checkbox"/> Insulation (extra clothing)	<input type="checkbox"/> Sun Protection
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cell phone
<input type="checkbox"/> Fire	<input type="checkbox"/> First Aid Supplies
<input type="checkbox"/> Edible plant guide	<input type="checkbox"/> Knot-tying guide
<input type="checkbox"/> Trekking poles	<input type="checkbox"/> Illumination
<input type="checkbox"/> Hydration (extra water)	<input type="checkbox"/> Repair Kit and Tools with knife
<input type="checkbox"/> Emergency Shelter	<input type="checkbox"/> Nutrition (extra food)
- Match each layer with the correct purpose.
 Wicking layer_____ Insulating layer_____ Protecting layer_____
 - To shield you from wind, rain, and snow; at least a water-repellant, breathable jacket
 - To transfer perspiration from the surface of skin to the next clothing layer or air
 - To provide additional warmth; breathable to let perspiration escape
- Select six items that can help you adapt to changing weather on a hike.
 hood cap flip flops water bottle roll-up sleeves zipper
 waterproof boots cotton jeans buff vest trekking poles

T F 4. It is acceptable to allow someone else to help you by carrying some of your essential gear.

Nutrition and Hydration: continued on next page

- T F 5. You can live weeks without food, but only 2 to 3 days without water.
- T F 6. At altitude, food intake can be more difficult due to impaired food absorption and poor appetite.
- T F 7. There's no need to drink until you feel thirsty.
- T F 8. WTS recommends carrying at least two liters of water on a day hike.

Fill in the blanks if submitting the homework as two separate sheets:

Senior Instructor: _____ **Student:** _____

- T F 9. Fluid losses increase at altitude due to more rapid breathing and drier air.
10. Calorie and fluid requirements _____ at higher elevations.
A. Increase B. Decrease C. Stay the same
11. It is better to (Check the ~~best answer.~~) **There are 2 correct answers.**
- Nibble small amounts of food frequently.
 - Wait for scheduled snack or meal breaks.
 - Eat large amounts of food several times during the hike.
 - Eat very little: hike day is a good time to lose some weight.
 - Sip small amounts of water frequently as you travel.
12. Match the Primary Functions of these major nutrients.
- | | |
|-------------------|--|
| ___ Carbohydrates | A. Tissue maintenance, growth, and repair; reduce blood sugar fluctuations |
| ___ Fat | B. Primary energy source, digest quickly; maintain blood sugar level |
| ___ Protein | C. Energy storage, digest slowly |
13. List what are good sources on a hike:
- | | |
|-------------------|--|
| ___ Carbohydrates | A. Tuna, deli meats, hard-boiled eggs, cheese, nuts, nut butters, hummus, jerky |
| ___ Fat | B. Butter/margarine, mayonnaise, nuts and nut butters, cheeses |
| ___ Protein | C. Granola bars, trail mix, fruit, sports bars, breads, crackers, cookies, candy |

Weather:

- T F 14. To avoid being caught on a summit or ridge during a thunderstorm, plan to start your descent early.
- T F 15. It can snow in the high country any month of the year.
- T F 16. Sudden temperature change, rising winds, and billowing vertical clouds are all indicators of an approaching thunderstorm.
17. Thunderstorms can occur in winter but are most likely from late ___ to late ____.
- | | | | |
|-------------|----------|--------------|-------------|
| A. January | D. April | G. July | J. October |
| B. February | E. May | H. August | K. November |
| C. March | F. June | I. September | L. December |
18. By counting the seconds between the flash and the thunder and dividing by five you get the distance in miles to the strike (except with blue sky lightning.). The 30/30 lightening safety rule states: seek shelter if there are ____.
- A. 15 seconds between (three miles away); stay sheltered for 15 minutes
 - B. 30 seconds between (six miles away); stay sheltered for 30 minutes
 - C. 45 seconds between (nine miles away); stay sheltered for 45 minutes

Fill in the blanks if submitting the homework as two separate sheets:

Senior Instructor: _____ **Student:** _____

Leave No Trace:

19. Select the seven principles of **Leave No Trace**:

- | | | |
|--|--|--|
| <input type="checkbox"/> Bury your trash | <input type="checkbox"/> Use tape to mark trail | <input type="checkbox"/> Dispose of waste properly |
| <input type="checkbox"/> Respect wildlife | <input type="checkbox"/> Plan ahead and prepare | <input type="checkbox"/> Build cairns to mark trail |
| <input type="checkbox"/> Feed wildlife | <input type="checkbox"/> Be considerate of others | <input type="checkbox"/> Travel and camp on durable surfaces |
| <input type="checkbox"/> Camp near stream | <input type="checkbox"/> Minimize campfire impacts | <input type="checkbox"/> Leave firewood for next group |
| <input type="checkbox"/> Do impulse trip | | |
| <input type="checkbox"/> Leave what you find | | |

T F 20. Walk alongside rather than in the middle of muddy trails so you don't get your boots dirty.

21. Select a bathroom location that is at least ____ feet from water sources.

- A. 100 feet B. 200 feet C. 300 feet

Wildlife:

22. Take these actions if you meet a moose. Circle each one yes or no.

Yes No Stay back or back away quietly.

Yes No Play dead.

Yes No If you see raised hackles, licking the snout, ears pinned back, run away as fast as you can or try to find shelter behind a boulder or large tree.

Yes No Get close enough for a good photo op.

Yes No Throw your pack at it to scare it away.

23. Take these actions if you hear or see a rattlesnake. Circle each one yes or no.

Yes No Move at least five feet away from it. Wait for it to move on, or circle around it.

Yes No Get close enough for a good photo op.

Yes No Stop, freeze in place. Determine its location. Check for others in the area.

Yes No Use your hiking pole to move it out of your way.

Yes No Leave the snake alone.

Yes No Squirt water in its face to get it to move.

24. Take these actions if you meet a mountain lion. Circle each one yes or no.

Yes No Stay back or back away quietly.

Yes No Play dead.

Yes No Do not run or move quickly. This may prompt it to chase you as prey.

Yes No Get close enough for a good photo op.

Yes No Be big. Raise your arms or open your jacket.

Yes No Fight back if attacked! Use any weapon at hand.

(Intentionally Blank)

HOMEWORK FOR SECTION II – NAVIGATION

- Check the schedule, read and view material for this section.
- Continue preparations for Dry Land Travel Day (Field Day 1).
- Begin preparations for Map and Compass Day (Field Day 2).
- Plot and check all assigned points on Mount Vernon and any additional designated map.
- Practice knots.
- Complete quizzes below or online and submit to your instructors.

Senior Instructor: _____ **Student:** _____

Map Reading: All questions refer to USGS topographic maps.

- T F 1. North is at the top, and the right and left edges form true north-south lines.
- T F 2. On a map with a scale of 1:24,000, one inch on the map represents about one mile on the ground.
- T F 3. The red section lines within USGS topo maps are reliable true north-south and east-west lines.
- T F 4. Contours are brown lines joining all points that are at the same elevation. The closer together the lines, the steeper the slope.
- T F 5. Green shows dense vegetation of shrubs or trees.
- T F 6. Contour line intervals are the same as USGS' (40 feet) on all topo maps in the US.
7. Select the four most important steps for figuring out your location on your map.
- Note the intersections with other trails or roads.
 - Calculate the declination at your location.
 - Note the shape and closeness of contour lines compared to the terrain around you.
 - Note the shape of the trail on the map compared to on the ground.
 - Follow a bearing to a known point.
 - Take a bearing on a feature that you can see on the map.
8. Why is it important to note the date a map was printed?
- | | |
|---|--|
| <input type="checkbox"/> Vegetation changes over time | <input type="checkbox"/> Declination changes over time |
| <input type="checkbox"/> Roads change over time | <input type="checkbox"/> Trails change over time |
| <input type="checkbox"/> Structures change over time | <input type="checkbox"/> All of the above |

Navigation Video:

9. Search and Rescue missions are most often sent out for hikers who are lost:
 off-trail ~70% on-trail ~20% on-trail ~70% off-trail ~50%
10. To help orient yourself on the Front Range, remember that Baseline Road in Boulder is on ____ (parallel) and Union Station in Denver is on ____ (meridian).
 Baseline 90° Baseline 40° Union Station -105° Union Station -90°
- T F 11. Traveling off-trail may require twice as much effort as traveling on-trail.

Fill in the blanks if submitting the homework as separate sheets:

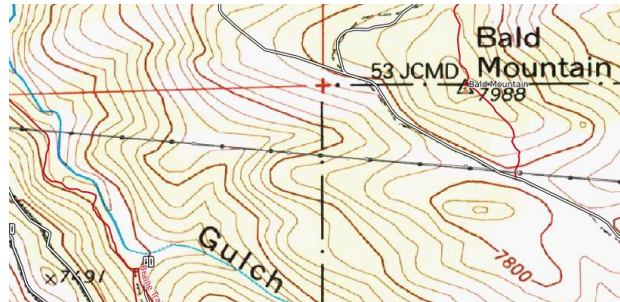
Senior Instructor: _____ **Student:** _____

Mount Vernon topographical map: (selected sections)

Map 1

12. How many feet would you have to climb to get from the point where the power line crosses the creek in the gulch to the top of Bald Mountain?

- about 260'
- about 2000'
- about 880'
- about 3300'



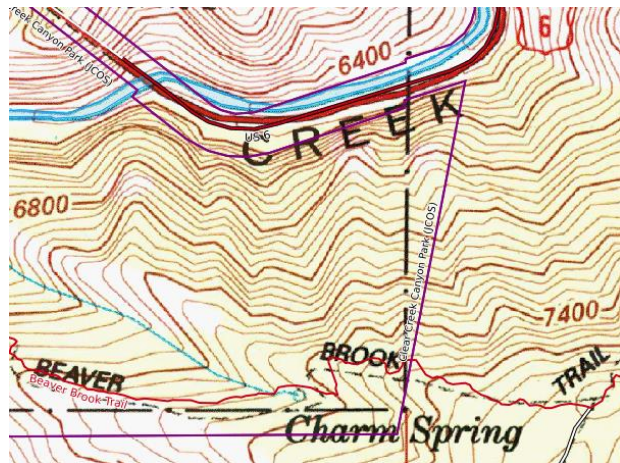
Map 2

13. How many feet would you have to descend to get from the spring (tiny blue circle) at Charm Spring directly north to U.S. Highway 6?

- about 1040'
- just under 900'
- about 2000'
- about 400'

14. Select the most serious problem you might face if you made that descent?

- poison ivy
- water crossing
- steep slopes
- no trail



Map 3

15. What is the true bearing from the spring to the junction of Beaver Brook Trail and the road?

- ~ 270 degrees
- ~ 180 degrees
- ~ 90 degrees
- ~ 45 degrees



16. What is the true bearing from the junction of Beaver Brook Trail and the road to the spring?

- ~ 270 degrees
- ~ 180 degrees
- ~ 90 degrees
- ~ 45 degrees

17. What is the general direction of travel from the spring to the junction of Beaver Brook Trail and the road?

- Northeast
- Southeast
- East
- West

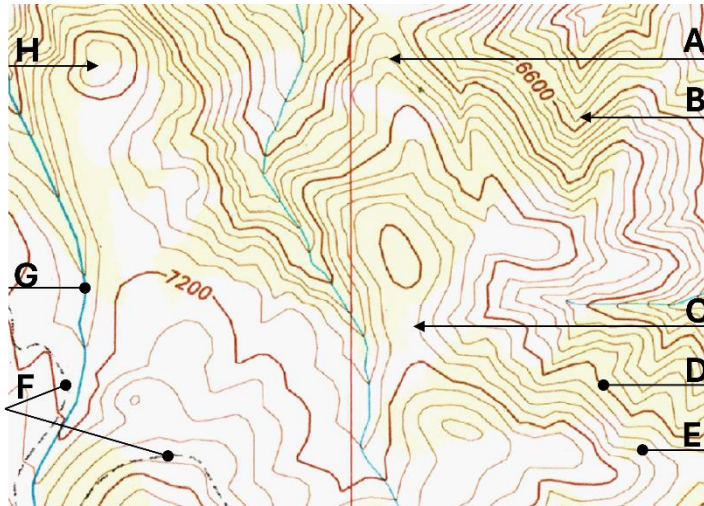
Fill in the blanks if submitting the homework as separate sheets:

Senior Instructor: _____ Student: _____

Map 4.

18. Identify the items indicated on the map. (The trail & park boundary layer is absent.)

- ___ Index contour
- ___ Intermediate contour
- ___ Saddle
- ___ Stream
- ___ Summit
- ___ Trail
- ___ Us/Vs pointing down
- ___ Us/Vs pointing up

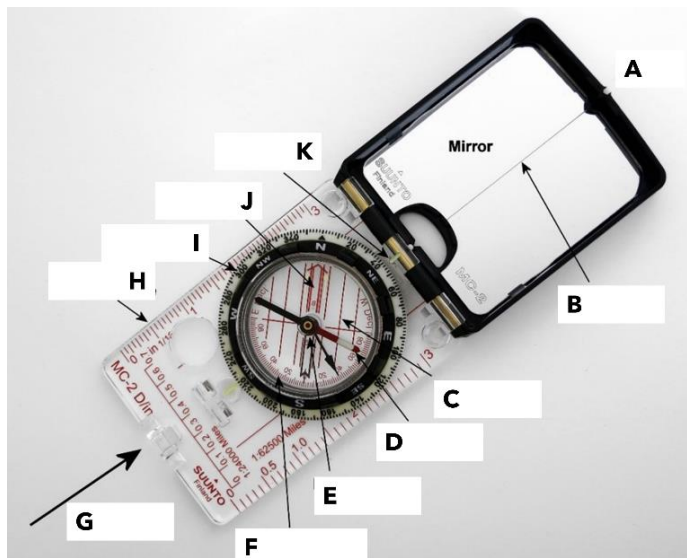


19. Points A and B mark: ___ Valley ___ Ridge

Compass Use:

20. Name these parts of a compass:

- Magnetic needle ___
 - Aiming notch ___
 - Orienting arrow ___
 - Sighting line ___
 - Dial ___
 - Meridian line ___
 - Base plate ___
 - Declination scale ___
 - Pivot ___
 - Index mark ___
 - Direction of travel ___
- (There is no direction of travel **arrow** on the MC-2.)



Fill in the blanks if submitting the homework as separate sheets:

Senior Instructor: _____ **Student:** _____

T F 21. In the western U.S., magnetic north always lies west of true north.

T F 22. This map symbol tells you that the magnetic declination (the angle between true north and magnetic north) was 8.1 when the map was printed.



23. Check three methods to remember how to adjust for declination in the field.

- Take the compass away from the map.
- Use $M = T - D$.
- Picture a declination map.
- Use $M = T + D$.

24. If the true bearing between two points in the field in Colorado is 220° , and the magnetic declination is 8° , what magnetic bearing will your compass show?

- $220^\circ + 8^\circ = 228^\circ$
- $220^\circ - 8^\circ = 212^\circ$

25. Match the degrees with each cardinal direction.

- | | |
|-------------|-----------------------------------|
| _____ North | A. 90° |
| _____ South | B. 180° |
| _____ East | C. 270° |
| _____ West | D. Both 0° and 360° |

26. What direction is 315° ?

- NE
- NW
- SW
- SE

27. Match the feature with its name.

- | | |
|------------------------------|--|
| _____ Handrail | A. A long, linear feature that is always in the same direction from the route, may be only intermittently visible. |
| _____ Fail-safe | B. A prominent feature that you can use as a marker is that you have traveled too far, or not far enough. |
| _____ Base line (catch line) | C. A prominent linear feature that parallels the intended route, may be only intermittently visible. |

28. It is important to know the number of paces per mile to measure distances. An average person's pace count is 1,000 paces per mile on level terrain. This equates to:

- 100 paces per 0.5 mile
- 100 paces per 0.1 mile
- 100 paces per 1.0 mile

T F 29. When using the compass as a protractor to measure bearings, you can ignore the direction of the compass needle.

T F 30. Iron, steel, electrical currents, cameras, and GPS units may strongly affect the orienting arrow.

HOMEWORK FOR SECTION III – EMERGENCIES

- Check the schedule, read and view material for this section.
- Prepare for Survival Day and Grad Hike.
- Assemble survival gear, clothing, and fire starters for testing.
- Practice knots.
- Obtain topographic map for Grad Hike.
- Review WTS Grad Hike form (at the end of the Homework section) and begin preparations for Grad Hike.
- Complete quizzes below or online and submit to your instructors.

Senior Instructor: _____ **Student:** _____

Survival and Incident Management:

- T F 1. A positive attitude is the most important element to increasing your survival odds.
- T F 2. Hypothermia is the #1 killer of outdoor recreationists.
- T F 3. The average outdoor survival emergency lasts five days.
- T F 4. The most important thing to use in an outdoor survival situation is your first aid kit.
- T F 5. The trip leader should always take charge as incident manager in case of an emergency.
- T F 6. The get-help team needs to know the location of the patient.
- T F 7. The bivy team needs to shelter at least the patient and first aiders from the elements.
8. When you head out for a hike (pick 4 answers)
- A. Leave your travel plans with a contact.
 - B. Just carrying a water bottle is good enough.
 - C. Do not go to a different location than the planned one.
 - D. Leave a written trip plan in your vehicle.
 - E. Leaving warm clothes and a rain jacket at home is fine as long as you check the forecast before you leave.
 - F. Discuss the SOP in the event someone gets separated from the group.
 - G. Bringing just enough snacks for your hike is ok.
9. You should carry a bivy or gear to create an emergency shelter.
- A. On every hike.
 - B. Only when you think you may have an unplanned night in the backcountry.
10. Circle the first action to take when you or your group realize they are lost.
- A. Split up and all go in different directions until someone finds the trail.
 - B. Return to the trailhead.
 - C. Stop and assess your entire situation.
 - D. Head to a baseline to regain group orientation.

Fill in the blanks if submitting the homework as two separate sheets:

Senior Instructor: _____ **Student:** _____

11. Match the features of distress signal in the wilderness in the United States:

- | | |
|----------------------|-----------------|
| _____ Help | A. One blast |
| _____ Where are you? | B. Two blasts |
| _____ Come here | C. Three blasts |

12. To get your precise location from your phone, with your location services ON, open Maps (Google) and press on the blue dot that marks your location. Your coordinates will appear in the top menu bar.

13. What is the most important aspect of your choice of fire starters?

- Waterproof First Time Every Time Easy to carry Familiar to you

14. What are the four roles needed in Incident Management?

- | | | |
|---|---|--|
| <input type="checkbox"/> Leader to assess supplies on hand | <input type="checkbox"/> Incident Manager | <input type="checkbox"/> First Aid Leader |
| <input type="checkbox"/> Leader to find cell phone coverage | <input type="checkbox"/> Bivy Leader | <input type="checkbox"/> Scout for water |
| <input type="checkbox"/> Leader for edible plants | <input type="checkbox"/> Get -Help Leader | <input type="checkbox"/> Navigation Leader |

15. Secure Site – List the priority order: 1st _____, 2nd _____, 3rd _____.

- A. Is the site safe for the First Aid Team?
 B. Is the site safe for other members of the group?
 C. Is the site safe for the patient?

16. Match the duties with each role:

- | | |
|------------------------|---|
| _____ Incident Manager | A. Assess the food and hydration status of the group. |
| _____ Bivy Leader | B. Oversee the end-to-end management of the incident. |
| _____ First Aid Leader | C. Assess and obtain the type of help needed. |
| _____ Get-Help Leader | D. Assess and treat the patient as possible. |

Wildfire:

T F 17. Smoke inhalation can damage healthy lungs and even kill you due to decreased oxygen, harmful particles, and toxic gasses.

T F 18. Fire travels more quickly when going downhill.

19. The best item to wear or carry so you can avoid fine particle smoke damage to your lungs from wildfire is:

- Fire extinguisher Fire retardant clothing Bandana N95 mask

20. The safest strategy to get away from a fire is:

- A. Hike to the head of the valley.
 B. Stay on a ridge line so you can see the fire.
 C. Hike back the way you came as it is the fastest way back to your car.
 D. Get to the other side of the ridge, away from the fire.

Fill in the blanks if submitting the homework as two separate sheets:

Senior Instructor: _____ **Student:** _____

Medical Emergencies:

- T F 21. You should assume a neck or back injury in all unresponsive patients.
- T F 22. Shivering, loss of dexterity, and becoming quiet may indicate hypothermia.
- T F 23. A basic first aid course provides adequate training for backcountry emergencies.
- T F 24. In a hot environment, cramps, fainting, and exhaustion may indicate heat exposure.
- T F 25. Shortness of breath, weakness, and headache may indicate acute mountain sickness (AMS) or high-altitude pulmonary edema (HAPE).
26. The best treatment for acute mountain sickness (AMS), high altitude pulmonary edema (HAPE), or high-altitude cerebral edema (HACE) is:
 A. Be sure the patient is well-hydrated.
 B. DESCEND to lower elevation.
 C. Give the patient easy-to-digest food.
 D. Make the patient sit or lie down and rest.
27. The initial evaluation of an accident patient includes an assessment of the ABC's:
 A Airway B Be calm C Consciousness
 A Assess accident causes B Breathing C Circulation

Survival Field Day Video: (See [Lecture Videos.](#))

- T F 28. In a survival situation it's more important to stay hydrated than to stay nourished.
- T F 29. Your survival equipment (tarp, cords, flashlight, etc.) should be camouflage color to blend in with the environment.
- T F 30. It is critical to maintain body temperature of all group members in a survival situation.
- T F 31. The first thing you should do in a survival situation is to start a fire.
- T F 32. The first thing you should do in a survival situation is to establish priorities.
- T F 33. A closed-cell foam pad is not useful unless it's full length (head to toes).
34. Your shelter needs to provide protection from what three things:
 Animals Wet Solar rays Wind Hunger Cold

(Intentionally Blank)

HOMEWORK FOR SECTION IV – SNOW TRAVEL

- Check the schedule, read and view material for this section.
- Prepare for Snow Travel Day.
- Assemble appropriate cold weather gear. (WTS provides ice axes and helmets.)
- Practice knots.
- Continue preparations for Grad Hike.
- Complete quizzes below or online and submit to your instructors.

Evaluations of the WTS course and of your instructors are due after your graduation hike.

Senior Instructor: _____ **Student:** _____

Snow Travel:

- T F 1. The number of snow layers has little impact on avalanche potential.
- T F 2. Suffocation is not the only way to be killed in an avalanche.
- T F 3. You don't have to be concerned that a 20° or 50° slope will slide.
- T F 4. A single beacon in a group of victims and rescuers is worthless.
- T F 5. One way to find avalanche chutes on a map is to look for a stripe of missing vegetation that goes down a hill.
- T F 6. If you have complete avalanche knowledge and do everything correctly, you don't have to be concerned about being caught in an avalanche.
- T F 7. The human factor has little impact on the occurrence of an avalanche.
- T F 8. After 30 minutes under the snow, buried survivors of an avalanche have a less than 50% chance of still being alive.
- T F 9. A small avalanche cannot bury a person.
- T F 10. If there's an expert in the group, you can relax and not pay attention to your own warning concerns.
- T F 11. One of the dangers in team decision-making is the desire to stay consistent with your original goals for the trip.
- T F 12. You can't trigger an avalanche if you're at the bottom of a hill.
13. Slopes that are between _____ are the most treacherous.
A. 30° and 45° B. 45° and 80° C. 15° and 65°
14. What are the three basics that are important in the formation of avalanche potential?
 Terrain Loud noises to trigger it Snowpack Person to trigger it
 Cornices CAIC rating of Considerable Weather Avalanche chute
15. What are the most important things in avoiding avalanche potential?
 Avoid avalanche chute. Carry a single beacon. Check CAIC rating.
 Check the sky for clouds. Travel with friends.
 Take avalanche safety courses. Follow tracks that indicate a slope is safe.

Fill in the blanks if submitting the homework as two separate sheets:

Senior Instructor: _____ **Student:** _____

16. The mnemonic ALPTRUTH may help you remember seven clues, which are:
- | | |
|--|---|
| <input type="checkbox"/> Avalanches in the last 48 hours | <input type="checkbox"/> Avalanches in past years |
| <input type="checkbox"/> Loading by new snow or wind in the past year | <input type="checkbox"/> Loading by new snow or wind in the past 48 hours |
| <input type="checkbox"/> Paths where avalanches obviously run | <input type="checkbox"/> Traps in terrain that can be fatal |
| <input type="checkbox"/> Tell-tale signs of animals running away | <input type="checkbox"/> Usable snow for building snow caves |
| <input type="checkbox"/> Rating of CONSIDERABLE or higher | <input type="checkbox"/> Rating of a good skiing day |
| <input type="checkbox"/> Packs of snow that look like they will crash down | <input type="checkbox"/> Unstable snow signs |
| <input type="checkbox"/> Thawing of the snow surface | <input type="checkbox"/> “Whoomph” sound coming from the snowpack |
17. Check the four factors that contribute to making bad decisions (e.g., getting summit fever, crossing an unstable snow field, etc.).
- | | |
|---|---|
| <input type="checkbox"/> Commitment to your goal of summiting | <input type="checkbox"/> Overconfidence |
| <input type="checkbox"/> The group being in an unfamiliar area | <input type="checkbox"/> Following the loudest voice |
| <input type="checkbox"/> Wanting to impress others in the group | <input type="checkbox"/> Having an independent streak |
18. What is the primary survival strategy with respect to avalanche hazards?
- | | | |
|---|--|--------------------------------------|
| <input type="checkbox"/> Swimming strokes | <input type="checkbox"/> Make an air pocket so you | <input type="checkbox"/> Avy beacon |
| <input type="checkbox"/> Don't get caught in one. | can breathe. | <input type="checkbox"/> Airbag pack |