

WEATHER MEASUREMENT



MATERIALS NEEDED:

- Anemometer (and thermometer if yours does not include one)
 - Use anemometer for temperature and wind speed measurements
- Compass
 - Use compass, wet finger, and observations of vegetation to determine wind direction
- Soil/Earth Thermometer
 - Use this to measure the temperature of the soil
- Sling Psychrometer
 - Use this to measure relative humidity

YOUR NAME

SITE NAME, LOCATION, DATE

TIME OF DAY AND TEMPERATURE

WEATHER CONDITIONS: FOR EXAMPLE, IS IT CLOUDY, SUNNY, WINDY, RAINING?

WIND CONDITIONS: SPEED AND DIRECTION

SOIL CONDITIONS: TEMPERATURE AND MOISTURE

HOW WILL THE WEATHER CHANGE IN FUTURE? WHAT WILL THAT MEAN FOR THE SUBALPINE ENVIRONMENT?

WHAT DO MOUNTAINS MEAN TO YOU?



FIELD GUIDE FOR SUSTAINABLE MOUNTAINS



“
SUSTAINABILITY IS THE PROCESS OF LIVING WITHIN THE LIMITS OF AVAILABLE PHYSICAL, NATURAL AND SOCIAL RESOURCES IN WAYS THAT ALLOW LIFE TO THRIVE IN PERPETUITY.
”

#MOUNTAINSMATTER



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CASE STUDY: MOUNTAIN GOATS

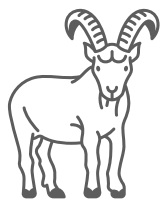
The greatest natural threats to mountain goats are starvation in late winter, avalanches, falls from steep cliffs and predation.

Mountain goats depend on body fat reserves accumulated in summer and fall to survive the brutal cold and wind of winter. Feed is available under the snow but offers little _____. Feeding in winter may just maintain health. Goats spend a lot of time sleeping in winter to lower the demand for _____. They also restrict their movements and may range in a small area for the winter.

In winter, goats prefer sunny south-facing slopes where snow cover is thin and plants start new growth early. _____ may occur in late winter and early spring when fat reserves are depleted and new plant growth is delayed by deep snow.

While they _____ well to cold temperatures and winter wind, they suffer in the summer heat. The southern boundary of their range is defined by heat stress mountain goats would suffer in areas to the south or at lower elevations.

_____ will impact mountain goats in two ways. Higher temperatures will cause trees to grow at higher elevations on mountainsides which will shrink the available alpine area. Climate change will also increase temperature and force mountain goats _____ on a mountain to avoid summer heat. This double squeeze will reduce mountain goat habitat and may reduce the abundance and variety of feed plants. Most remain in the herd, but a few will _____ and join other herds. _____ for survival are thereby shared with other herds.



CALORIES HIGHER DISPERSE
TRAITS ADAPT
CLIMATE CHANGE STARVATION NUTRITION

CASE STUDY: SALAL

By retaining _____ year-round, these species reduce the energy and time needed to invest annually in new leaves, a clear advantage in places where the growing season is _____. Being evergreen, salal retains its leaves and stems so they can instantly photosynthesize when the snow cover is removed.

SALAL STUDY CONTINUED

Being _____ rather than annual is an adaptation that makes living in the alpine more efficient. Perennial plants have a life cycle that occurs over two or more years. Even if the plants are _____ and lose leaves during the winter, they do not need to invest annually in building a root structure, and can leaf out using _____ stored over winter in their roots.

As mountains are subject to higher mean temperatures, cold adapted species decline. Seasonal snow cover is reduced, mountain vegetation will be subject to more extreme weather – frequent droughts, wildfires, and flooding.

SHORT ENERGY PERENNIAL
DECIDUOUS FOLIAGE



DISCUSSION POINTS

WHAT IS A BLACK BEAR'S GREATEST ADAPTATION?

- a) an extensive DVD collection
- b) their charm
- c) an ability to eat many different things

THE GALAPAGOS FINCHES ARE:

- a) a rock band from the 60's
- b) expensive sneakers
- c) an example of natural selection at work: the birds with larger beaks being able to eat larger seeds not ordinarily part of their diet to survive

BIRDS THAT DO NOT MIGRATE BUT CANNOT ADAPT TO SURVIVE THE WINTER ARE

- a) the Toronto Blue Jays
- b) Angry Birds
- c) unlikely to survive to pass on their genetic traits

SUBDUCTION IS

- a) a type of international electronic espionage
- b) layers of cheese, salami, tomatoes, ham, lettuce, and pickles
- c) a collision between two of Earth's tectonic plates, where one plate sinks into the mantle underneath the other plate

DISCUSSION CONTINUED

ROCK, DUST AND SOIL SITTING ATOP A LAYER OF BEDROCK IS

- a) Legolas
- b) Basilisk
- c) Regolith

KRUMMHOLZ IS

- a) A traditional German shortbread cookie
- b) A cordless vacuum cleaner
- c) Stunted or deformed vegetation in the subalpine

FLAGGING IS

- a) How you start a Formula One race
- b) What you wave on Canada Day
- c) Where there's growth on only one side of a tree due to winds

HOW DO GROUSE SURVIVE THE SUBALPINE WINTER?

- a) They watch Netflix
- b) They play outdoor hockey
- c) They do not migrate. They have snowshoes-like lateral extensions of the scales of their toes. They also burrow into the snow, which keeps them warm and protects them from predators.

WHO DISCOVERED NATURAL SELECTION?

- a) Justin Trudeau
- b) Dua Lipa
- c) Charles Darwin

A LARGE ROCK THAT IS DIFFERENT FROM SURROUNDING ROCK AND WAS TRANSPORTED FROM ITS ORIGINAL LOCATION BY A GLACIER IS CALLED AN

- a) Elliptic
- b) Eccentric
- c) Erratic

ANIMALS THAT DON'T ADAPT TEND TO BE

- a) Voted off the island
- b) Survivors of the Fittest
- c) Unlikely to pass on their genetic traits to a new generation