

For Creative Minds

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Mountain Ecosystems

A plant or animal's *habitat* is where it lives and can get food. The habitat is part of an *ecosystem* where many different plants and animals interact. Ecosystems include living and non-living things (like soil and rocks).

Ecosystems change with the height above sea level (*elevation*) and the distance from the equator. The climate gets colder and harsher the higher you climb or the closer you are to the poles.

The *alpine* or *tundra* ecosystems are treeless areas high on mountains or in the Polar Regions. Because of the strong winds and cold temperatures, both ecosystems are snow or ice-covered with low-growing lichens, mosses, and stunted shrubs. Plants and animals living in these areas are well adapted to cold, harsh climates. Trees cannot survive here; the line where trees stop growing is called the *tree line*.

Subalpine ecosystems are mountain ecosystems found below the tree line, including both *boreal* (sometimes called *taiga*) forests and grassy meadows. This ecosystem is similar to forests in the Sub-Arctic. (Sub means under, beneath, or less than, as in subtraction.) The subalpine climate is still cold but not as harsh as the alpine or tundra climates. The wind, especially at the tree line, is still a strong force, causing some trees to bend into strange shapes, or have leaves only on one side (the side away from the wind). The *conifer* trees that grow here keep their needle-like leaves year round and drop pinecones. Winters are long and harsh with a very short "summer" growing season.

The lower-elevation mountain ecosystems depend on where in the world they are. They might be deserts, river valleys, meadows, or forests. There are snow-capped mountains close to the equator that have tropical rainforests at lower elevations!

North Pole / Arctic

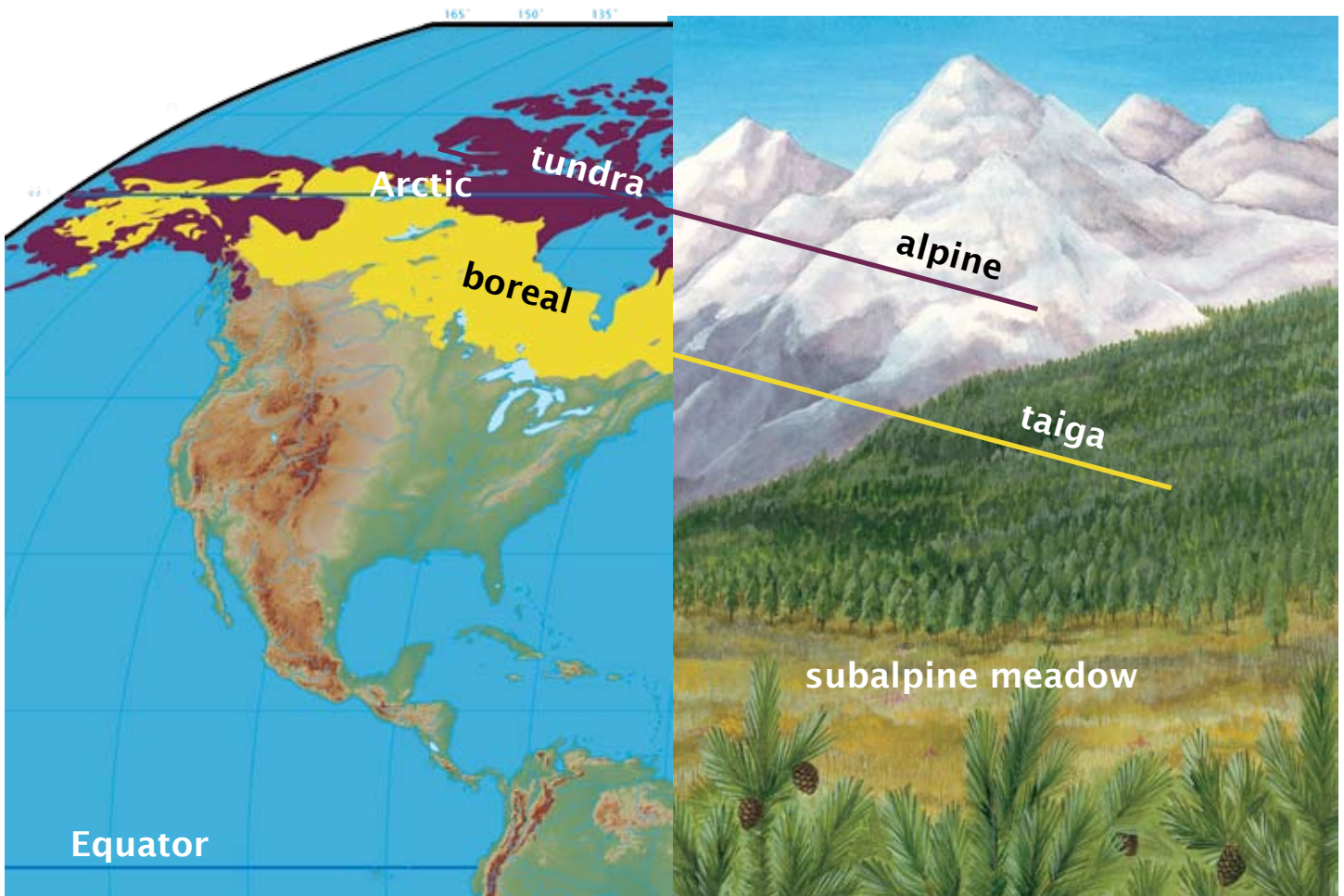


South Pole / Antarctica

8500 ft. / 2590.8 m
8000 ft. / 2438.4 m
7500 ft. / 2286.0 m
7000 ft. / 2133.6 m
6500 ft. / 1981.2 m
6000 ft. / 1828.8 m
5500 ft. / 1676.4 m
4500 ft. / 1371.6 m
4000 ft. / 1219.2 m
3500 ft. / 1066.8 m
3000 ft. / 914.4 m
2000 ft. / 609.6 m
1500 ft. / 457.2 m
1000 ft. / 304.8 m
500 ft. / 152.4 m
Sea level

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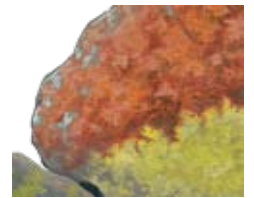
Above or Below the Tree Line?

Which of these would you most likely find above the tree line?



Bears, foxes, mice, birds and humans are just a few of the many animals that love eating wild berries.

Lichens look like moss but are algae and fungus combined. Deer, mountain goats, and reindeer eat it.



Conifers provide food (pinecones) and shelter (year-round leaves) for a wide variety of animals.

Wildflowers grow without any help from humans. Bees and hummingbirds rely on the pollen.



Answer: lichens

Match the Animals

Match the animal to its description. Use the animal-class color-coding to help. Answers are upside down on the next page.

1

These **mammals** are not always black. They can be brown or even a reddish-brown. Fruits and nuts are among their favorite foods but they will also eat insects, fish, and small mammals. They will even eat garbage! These animals can be found in forests and mountain ecosystems up to the tree line.

garter snake



Thamnophis sirtalis

2

These **birds-of-prey** live in the boreal forests and high taiga mountain ecosystems of the Western U.S. They are the largest animal of their kind in North America. They can hunt and capture food under snow using their sharp hearing. Like all other animals of this type, they throw up pellets of undigested food consisting of animal bones and fur.

bighorn sheep



Ovis canadensis

3

These **reptiles** are found in backyards, meadows, and mountain forests. They eat earthworms, insects, frogs, lizards, and mice. Like other snakes, they shed their scaly skin as they grow. They hibernate during the winter, often coiling with others of their same kind for body warmth.

Clark's nutcracker



Nucifraga columbiana

4

Found high in the mountain pine forests during the summer, these **birds** use their long beak to open pinecones to get the seeds. Using a special pouch, they can carry up to 150 seeds and bury them for later. By doing this, the birds help to spread pine seeds for new trees to grow. They also eat insects, small mammals, and meat from already dead animals (carrion).

black bears



Ursus americanus

5

Easily recognized by their curly horns, these **mammals** graze grasses from deserts to high mountain meadows and migrate up and down the mountains depending on the season. The rams (males) fight each other with their horns. The winner gets the girl!

Great Gray owl



Strix nebulosa

long-toed salamander



Ambystoma macrodactylum

There are many different species of this tiny **bird** found in ecosystems all over the world. The broad-tailed variety lives high in the subalpine meadows of the Rocky Mountains and down into Mexico. By drinking nectar, they help to pollinate flowers.

6

broad-tailed hummingbird



Selasphorus platycercus

Related to squirrels and woodchucks, these yellow-bellied **mammals** live social groups called colonies in alpine meadows. Depending on the altitude of their burrows, they generally hibernate from fall to spring. The young are born in the late spring/early summer when there are a lot of grasses and plants to eat.

7

mountain goat



Oreamnos americanus

These high-elevation **amphibians** need to live near streams, ponds, or lakes. The female lays eggs in the water. After hatching, the larvae breathe with gills and swim. As they grow up, they develop lungs for breathing air and move onto land.

8

snow flea



Hypogastrura nivicola

The white, shaggy fur helps these **mammals** to blend into the snow and rocks above the tree line where they live. Native to the northern Rocky and Cascade Mountains, they were introduced to the southern Rocky Mountains where they compete with the native bighorn sheep for food (grasses, lichen, moss, or twigs).

9

yellow-bellied marmot



Marmota flaviventris

These teeny, tiny **insects** jump around like fleas but are not related to fleas you might find on dogs or cats. You can find them at any time of the year but they are more easily seen against the white snow. They come out on warm, sunny days to eat detritus (dead, decaying plants and animals).

10

1. black bear, 2. Great Gray Owl, 3. garter snake, 4. Clark's Nutcracker, 5. bighorn sheep, goats, 10. snow fleas
6. broad-tailed hummingbird, 7. Yellow-bellied marmot, 8. salamander, 9. mountain