

Reading Passage: Plant Adaptations - Response to Seasons

How does this plant know it's Christmas?



Plants determine the time of year by the length of daylight. During winter days, there are less hours of sunlight than during summer days. In the winter, it starts getting dark very early in the evening, and then stays dark while you're getting ready for school the next morning. But in the summer, it will be bright early in the morning, and the Sun will not set until late that night. Plants have a built-in light-sensitive response that allows them to sense the differences in day length. For example, in the fall, when the days start to get shorter, the trees sense that there is less sunlight. The plant responds by sending messages to the leaves to change colors and fall.

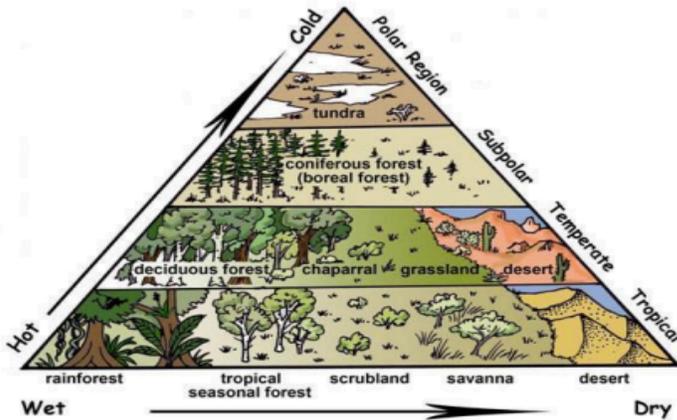
Class Discussion Questions:

1. How do plants detect a change in seasons? _____

2. What signals a deciduous (dee-sid-you-us) tree to drop its leaves? _____

Biomes on Earth

Biomes were formed by climate (rain and temperature) and location on Earth (tropics to polar regions).
Can you see the pattern below?



Each of the biomes described below has a distinct climate based on its elevation (height above sea level), latitude (distance north or south of the equator) and proximity to large bodies of water (closer to water will generally be wetter).

Tundra: Polar region. Extreme cold. Very Low rainfall. (Desert-like) Low humidity.

Taiga: In North America, it's known as the boreal, or coniferous, forest. Subpolar region. Harsh cold climate. Low rainfall. Low humidity.

Deciduous forest: Temperate region. Will experience four seasons. Moderate, consistent rainfall. Moderate humidity.

Grassland: Temperate region. Large open areas. Low rainfall. Most rainfall is experienced during the rainy season. Low humidity.

Desert: Temperate (and tropical) region. Low rainfall. Low humidity. (Far from coastlines or inside mountain ranges.)

Rainforest: Found in tropical regions. Near the equator. High amounts of rainfall. High temperatures. High humidity.



FOCUS on GRASSLANDS:

Think about animals that graze in grasslands—what part of the plant do they eat? Think about fires that spread across the grasslands—what part of the plant burns?

Four characteristics of Grassland Plants:

1. _____
2. _____
3. _____
4. _____

Explain how the plants of grasslands have adapted to survive grazing by animals and fire in their environment.



FOCUS on TROPICAL RAINFOREST:

Rainforests have very poor soil which lacks nutrients due to the large amount of rainfall. Plants must be able to get nutrients either on the surface of the ground or before they reach the ground.

Four characteristics of Rainforest Plants:

1. _____
2. _____
3. _____
4. _____

Explain how the plants of the tropical rainforest have adapted to survive by getting their nutrients from the surface of the ground or even before the nutrients get absorbed into the ground. _____



FOCUS on DESERT:

All deserts share one characteristic: they are very dry. Not all deserts are hot and not all are composed of sand. Some are cold, some are covered with pebbles and some with cracked mud. Plants living in the desert must be able to absorb and store water.

Four characteristics of Desert Plants:

1. _____
2. _____
3. _____
4. _____

Explain how the plants of the desert have adapted to survive by absorbing and storing water during long, dry periods. _____

Four characteristics of Taiga Plants:

1. _____
2. _____
3. _____
4. _____

Other Plant Adaptations

Carnivorous plants can be found in many different ecosystems, but the one thing they all have in common is that they live in extremely poor, almost sterile soils. These soils are often waterlogged and saturated with water, making it difficult for soil bacteria to do their jobs and recycle nutrients back into the soil. Because the soil that they live in is nutrient deprived, they have adapted a way to catch and digest insects that are found in their habitats to provide the nutrients they need. They attract and prey on small insects such as gnats, flies, bees, moths, beetles and ants. Some carnivorous plants emit sweet, flowery scents, but others emit smells that resemble rotting fruit or flesh.

Common carnivorous plants in Florida include pitcher plants, venus fly traps and sundews. Carnivorous plants have modified leaves that allow them to catch and dissolve insects. What is this adaptation helping the plant to do in order to stay alive?

Another adaptation found in plants in our region of Florida are halophytes (hal - salt, phyt - loving). Especially in areas near Florida coastlines, plants are exposed to higher than otherwise acceptable levels of salt in the water. Most plants do not thrive, and will often die, if exposed to high amounts of salt in the water. Along our coastlines, there are populations of plants that are adapted to live in these high-salt environments.

Trees like the mangrove tree are able to remove the salt from saltwater and excrete it out of their leaves or store it in old bark that will eventually drop off of the tree, taking the salt with it. Another saltmarsh plant that can remove and excrete salt is cordgrass. It takes in the saltwater through its roots and then removes the salt and releases it through its leaves. The leaves of both the mangrove tree and cordgrass have thick, waxy outer coverings to prevent additional water loss. Plants like sea oats, oleander, beach sunflower, day lilies, zinnias, and petunias are common plants that are salt-tolerant. Halophyte (salt loving) plants have adapted processes that allow them to remove salt from the water they take in and excrete it through their leaves. How does this adaptation help the plant to stay alive?

Reading Passage: Behavioral Adaptations

Behavioral adaptations are the way animals behave, or act, in order to survive. Some of these behaviors are instinct. This means the animal didn't have to learn the behaviors. They were born knowing how to do it. When we blink our eyes, or jump when we hear a loud sound, we are acting on instinct. Spiders know how to spin webs without being taught. Other behavioral adaptations are learned. These behaviors are taught to offspring by their parents or other members of their group. Parents train their offspring to hunt or find food, to build places to sleep, or to find shelter.

1. What are two types of behavioral adaptations that animals may demonstrate?

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Video: Animal Hide and Seek (Sci Kids)

What are the 2 main reasons for animals to use camouflage?

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Video: Animal Tricksters (Sci Kids)

What structural adaptation does the owl butterfly use to protect it from being eaten by birds? _____

Look closely at the false coral snake and the scarlet kingsnake. How can you tell them apart? (Hint: Look at the head!) _____

How does the sabretooth blenny use mimicry to impersonate a bluestreak cleaner wrasse? _____

Mimicry allows harmless animals to appear _____ to stay _____.

It also allows a harmful animal to appear _____ to get closer to its _____.

Animal Adaptations: Body Parts

Identify an example of a bird with the beak style shown. Match the beak style to the function.

Beak Style	Common bird	Function
		<p>Birds that rely on fishing for food have long, spear-like bills.</p>
		<p>Some birds have long, chisel-like beaks for boring into wood to eat insects.</p>
		<p>Insect eaters have thin, pointed bills.</p>
		<p>Some ducks have long, flat bills that strain small plants and animals from the water.</p>
		<p>Seed-eaters have short, thin, conical bills for cracking seeds.</p>
		<p>Some bills are long and slender for probing flowers for nectar.</p>
		<p>Birds of prey have curved beaks for tearing meat.</p>
		<p>Some birds have a multi-purpose bill that allows them to eat fruit, seeds, insects, fish, and other animals.</p>

Structural or Behavioral Adaptations (Check off the correct column to identify each adaptation description as either a Structural or a Behavioral Adaptation.)

Adaptation Description	Structural (Physical)	Behavioral
Hummingbirds have long, slender beaks that help them drink nectar deep inside flowers.		
A giraffe’s long neck allows it to reach higher food sources.		
Ospreys have sharp talons on their feet to grab fish out of the water.		
Pelicans have large pouch-like beaks to scoop up fish.		
Gorillas use slender sticks or long blades of grass to “fish” for termites in the ground to eat.		
The toucan has four toes on each foot. Two that face forward and two that face backward. This allows them to perch on branches high up in the rainforest.		
Bison have specialized teeth and digestive systems that help them break down the tough grasses found in the grasslands.		
Sloths move very slowly, making it harder for predators to see them.		
Manatees migrate into warm water refuges from November through March.		
Cockroaches are generally nocturnal and scatter when the lights are turned on.		
As amphibians, desert toads need water to complete their life cycles. They burrow underground in September and remain there until the rainy season begins in May.		
Mountain goats have highly adapted hooves that help them to easily climb up steep mountain slopes.		
Rat snakes give off an unpleasant odor to defend themselves from predators.		
Blue crabs bury themselves when they feel threatened.		
Geckos are able to climb up walls and smooth surfaces because the ends of their toes are covered with hundreds of fine hair-like structures.		

17. What Ecosystem am I?

Plant Adaptations

Plants are able to excrete salt

Leaves float on the surface

Roots are used to hold plants in place

Leaves and stems are flexible

Animal Adaptations

Some birds have long, unfeathered legs

Birds and other animals are able to excrete salt

Some animals come to the surface to breathe

Some animals use gills

18. What Ecosystem am I?

Plant Adaptations

Plants have shallow roots

Smooth bark or surface so water runs off

Plants prop or stilt root systems to hold the plant up

Leaves have waxy surfaces or drip tips so water runs off

Animal Adaptations

Animals are very specialized

Some animals use bright colors to warn predators to leave them alone

Some animals use camouflage and are almost impossible to see

Some animals never spend time on the ground

19. What Ecosystem am I?

Plant Adaptations

Plants are small

Plants grow close to the ground

Plants may be dark in color

Roots are shallow

Plants grow close together for protection

Animal Adaptations

Small, thick animals with short legs

Thick fur or extra fur, feathers or fat layers

Go through periods of dormancy

Animals may migrate during extreme conditions

20. What Ecosystem am I?

Plant Adaptations

Waxy coating to reduce water loss

Long, deep root systems to absorb water

Have spines to keep from being eaten

Grow very slowly to prevent water loss

Animal Adaptations

Dig burrows to get out of extreme conditions

Store fat in humps or tails rather than all over the body

Have large ears to get rid of heat

Get the water they need from the food they eat

21. What Ecosystem am I?

Plant Adaptations

Roots grow deep

Plants grow from near the base

Plants readily re-sprout after fire or grazing

Soft stems allow them to bend in the wind

Animal Adaptations

Highly camouflaged to blend in with the environment

Some of the fastest animals on Earth

Some animals build extensive tunnels for shelter from predators and weather

22. What Ecosystem am I?

Plant Adaptations

Plants produce broad, flat leaves to capture sunlight

Some plants lose their leaves and go dormant during shorter, colder days

Wildflowers bloom before trees leaf out

Trees have thick bark for protection

Animal Adaptations

Animals are able to survive across large temperature changes

Birds migrate through as they search for food and favorable weather

Some mammals go through periods of dormancy

Some animals produce different hair structures in colder weather

Check What You Know!!

1. The Eastern coral snake is a venomous snake that has very bright colors. The king snake is a non-venomous snake that looks very similar to the Eastern coral snake. How does the king snake's coloring help it survive?

- A. The king snake's markings deter predators that think it might be venomous.
- B. The king snake's markings help it to find food.
- C. The king snake's markings attract coral snakes as possible mates.
- D. The king snake's markings protect it from the venomous coral snake.

2. Many animal characteristics are inherited. The animal's environment can affect other characteristics. Which of the following is an example of a physical characteristic that can be affected by the environment?

- A. Color of a cat's fur
- B. Spots on a leopard
- C. Color of an arctic fox
- D. Leathery skin of a snake