

Adaptations

All plants have roots, stems, leaves, and seeds, which help them get everything they need to survive. Plants need food (nutrients & sunlight), water, shelter, and space. When conditions are not ideal, plants must adapt their roots, stems, leaves, how they disperse seeds, or tolerance for certain nutrients in order to survive. For example, in places that are hot and dry during the day and cool at night, some plants adapt by only opening their flowers at night or by growing extremely long roots to pull water from deeper more moist soil.

Pre-Visit Activities

What do plants need to survive?

Ask students what they know about what humans need to survive. (Water, Food, Place/Space/Home, Sunlight, and Air). Use the word PLANT as an acronym to identify what plants need to survive. P-place, L-(sun)light, A-air, N-nutrients, T-thirst (water).

Discuss the parts of a plant.

Have students identify which parts plants use to get what they need to survive.

At the Conservatory

Palm House

Ficus
Firecracker Plant
Bamboo

Fern Room

Cycads

Sugar From the Sun

Mangroves
Pineapples

Desert House

Saguaro Cactus
Aloe

Aroid House

Giant Sea Grape
Swiss Cheese Plant

Horticulture Hall

Banana Plant
Ginger

Post-Visit Activities

Compare and Contrast Plant Habitats. Identify plants that would survive well in various conditions. What helps those plants survive?

Compare and contrast seeds. Have students collect and bring in seeds from three different fruit. Discuss how the variation helps seeds germinate given their environment.

Identify plants that reproduce by rhizomes. How does that help that species of plant survive? When can growing from seeds be more advantageous than growing from a rhizome?

NGSS:

- K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.
- 2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.
- 3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.
- 3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms survive well, some survive less well, and some cannot survive at all.
- 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- 5-LS1-1 Support an argument that plants get the materials they need for growth chiefly from air and water.

Additional Resources:

Intro to Plant Adaptations: <http://www.mbgnet.net/bioplants/adapt.html>

<https://www.youtube.com/watch?v=4e-LXjFquWY>

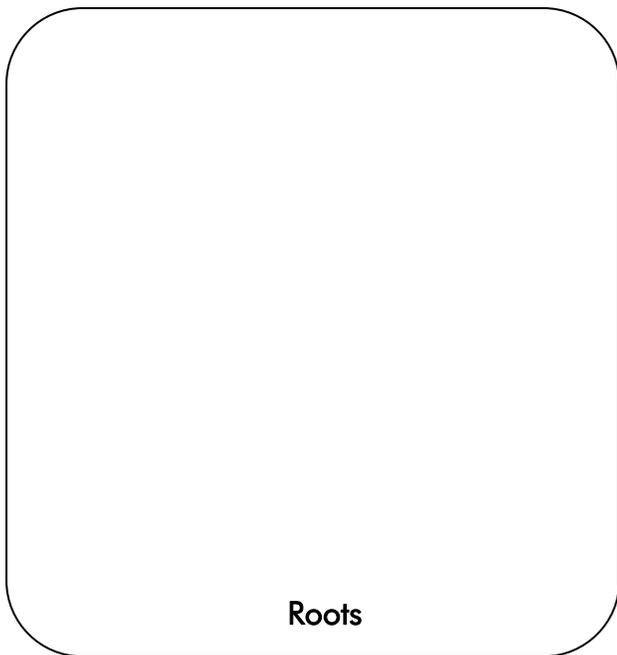
Carnivorous Plants: <https://www.youtube.com/watch?v=-iHIKhKCg6E>

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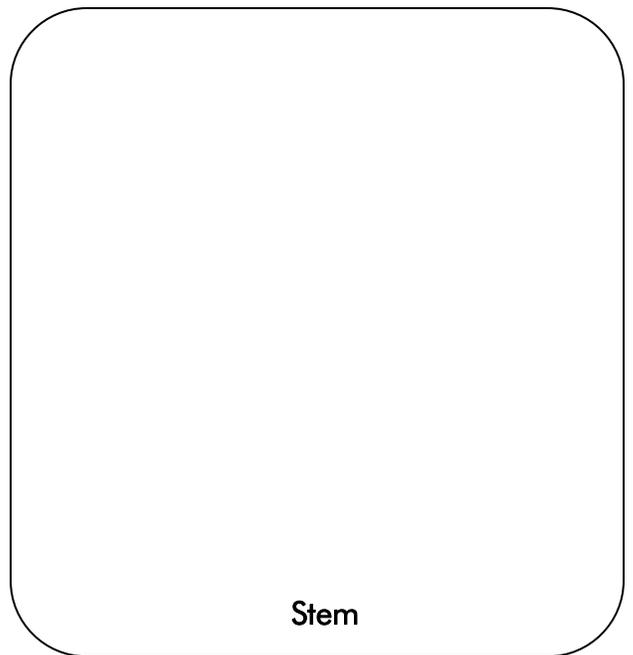
What does adaptation mean?

Why do plants adapt?

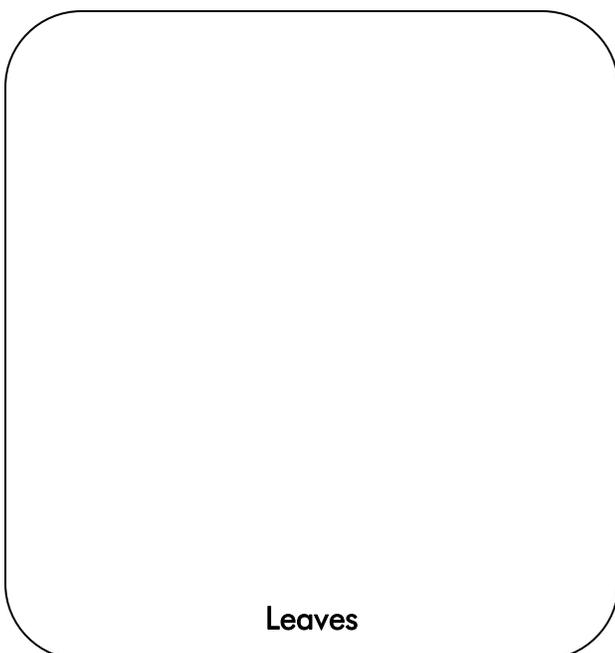
Plants typically adapt their roots, stems, leaves, OR seeds. Name or draw an example of each type of adaptation that you saw today.



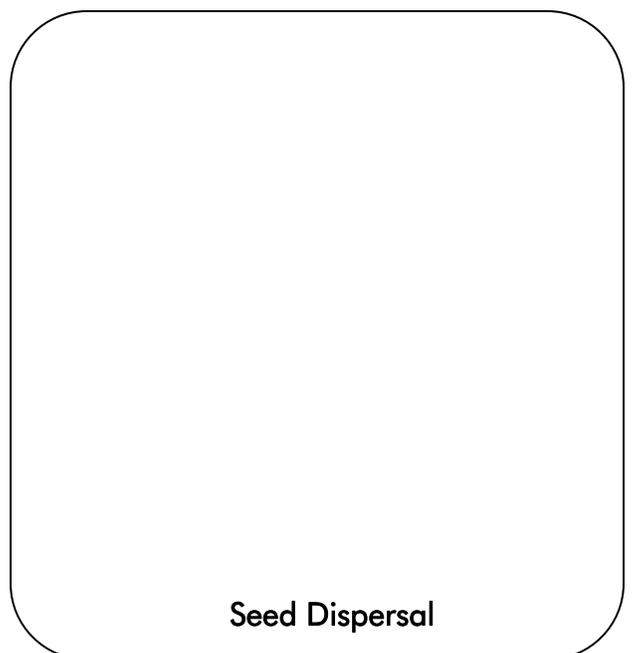
Roots



Stem



Leaves



Seed Dispersal

Adaptations

Vocabulary

Adaptation — a change or the process of change over time to enable an organism or species to be better suited to its environment.

(Seed) Dispersal — the process by which a plant moves or transports its seeds any distance away from the parent plant, for the purpose of propagation and survival.

Leaf — a part of basic plant anatomy which allows for transpiration of water, release of carbon, and absorption of energy from the sun. The biological structure of leaves allows for photosynthesis.

Stem — a part of basic plant anatomy which carries water and nutrients throughout the vascular structure of the plant. Stems usually grow above the soil in the opposite direction of roots and are essential in providing physical above ground support for the plant.

Root — a part of basic plant anatomy which is responsible for pulling nutrients, air, and water from the soil, keeping the plant in place. Usually grows under the soil.

Aerial Roots — a plant adaptation of its root system, which grows above ground as opposed to below ground.

Seed — a part of basic plant anatomy which allows the plant to reproduce.

Rhizome — a plant adaptation of its stem. Rhizomes are swollen roots containing all of the essential nutrients and structures to produce a new plant. Plants form rhizomes intentionally.

Propagation — term referring to either the natural or artificial (assisted by human interference) process of producing a new plant.

Talking Points

- ◇ Plants adapt very slowly over time, often over thousands of years. An adaptation allows a plant to survive in a particular place.
- ◇ Adaptations are a result of natural selection. The part of their structure that they adapt is closely connected to their environmental conditions and alternative ways they can get their needs met.
- ◇ Tropical Climate Adaptations
 - ◇ Plants need to control their water levels and support themselves in very wet soil, shallow soil, or loose soil.
 - ◇ Plants must compete for sunlight.
- ◇ Desert Climate Adaptations
 - ◇ Plants need to ensure they have enough water to survive in such a dry climate.
 - ◇ Plants must protect themselves from predators and temperature extremes.