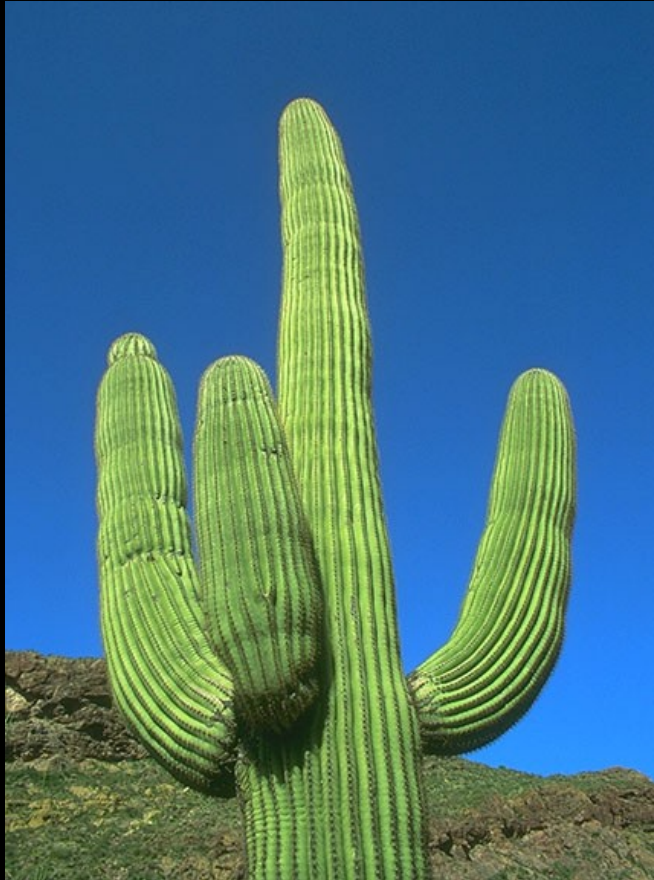


Plant Adaptations

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Definition of Adaptation:

- The adjustment or changes in behavior, physiology, and structure of an organism to become more suited to an environment.
- It is derived from latin word “*adaptare*” which means “*to fit*”.

Plant Adaptations

- Plants have adaptations to help them live and grow in different areas. These adaptations might make it very difficult for the plant to survive in a different place. This explains why certain plants are found in one area, but not in another. For example, you wouldn't see a cactus living in the Arctic. Nor would you see lots of really tall trees living in grasslands.

WHY DO PLANTS ADAPT?



**Spikes or
thorns**



WHY DO PLANTS ADAPT?

**Brightly colored
fruits and
vegetable
attract animals**



**Colorful
petals
attract
birds
and
insects**



WHY DO PLANTS ADAPT?



Forests



Deserts



Types of Adaptations

- Structural adaptations are the way something is built or made.
- Behavioral adaptations are the way something acts naturally or by instinct.

Structural Adaptations

- **Adaptations to get food**

- Leaves and stems absorb energy from the sun.



Behavioral Adaptations

- **Adaptations to get food**
 - Plants lean or grow towards the sun.
 - Roots grow down into soil.
 - Vines climb up trees to catch sunlight.



Behavioral Adaptations

- **Adaptations to get food**
 - Plants like the Venus fly trap, trap insects for food.



Structural Adaptations

- Adaptations to get water and nutrients
 - Roots soak up water and nutrients from soil.



Behavioral Adaptations

- Adaptations to get water and nutrients
 - Desert flowers can stay dormant for months, only coming to life when it rains.



Structural Adaptations

- **Adaptations for reproduction**
 - Brightly colored flowers with nectar attract pollinators such as birds, bees and insects.



Structural Adaptations

- **Adaptations for reproduction**
 - Sweet fruit attracts animals that spread seeds far away.
 - Some seeds are shaped to catch the wind.



Behavioral Adaptations

- **Adaptations for reproduction**
 - Plants drop seeds to grow new offspring.



Structural Adaptations

- **Adaptations for defense**
 - Spines and thorns protect plants from predators



Structural Adaptations

- **Adaptations for defense**

- Poison Ivy and Poison oak have toxins that give predators a painful itchy rash.



Plant Adaptations for different Biomes



Desert Adaptations

- Small leaves or spines on desert plants conserve water.
- Thick waxy skin holds in water.
- Roots near the soils surface soak up rain water quickly before it evaporates.



Grassland Adaptations

- Deep roots help plants survive prairie fires.
- Narrow leaves lose less water than broad leaves.
- Flexible stems



Tundra Adaptations

- Small plants grow close to the ground for warmth.
- Dark colored flowers absorb heat from the sun.
- Fuzzy stems provide protection from wind.



photo by Amanda Graham

Rainforest Adaptations

- Smooth, slippery bark keeps vines from killing trees.
- Slide shaped leaves lets rain run off so fungus doesn't grow on plants.



Temperate Forest Adaptations

- Thick bark protects trees and dropping leaves in winter conserves water and nutrients during cold winters.



Water Adaptations

- Flexible stems move with water currents.
- Floating seeds spread offspring.



Below are some areas of the adaptations plants have to live in:

- Deserts
- Grasslands
- In water
- Taiga
- Tropical rain forest

Desert Plant Adaptations

Desert Plant Adaptations

- Some plants, called succulents, store water in their stems or leaves
- Some plants have no leaves or small seasonal leaves that only grow after it rains. The lack of leaves helps reduce water loss during photosynthesis. Leafless plants conduct photosynthesis in their green stems.
- Long root systems spread out wide or go deep into the ground to absorb water.

Desert Plant Adaptations

- Leaves with hair help shade the plant, reducing water loss. Other plants have leaves that turn throughout the day to expose a minimum surface area to the heat.
- Spines to discourage animals from eating plants for water;
- Waxy coating on stems and leaves help reduce water loss
- Slower growing requires less energy. The plants don't have to make as much food and therefore do not lose as much water.

Desert Plant Adaptations



TEMPERATE GRASSLAND PLANT ADAPTATIONS

TEMPERATE GRASSLAND PLANT ADAPTATIONS

- During a fire, while above-ground portions of grasses may perish, the root portions survive to sprout again.
- Some prairie trees have thick bark to resist fire.
- Prairie shrubs readily resprout after fire.
- Roots of prairie grasses extend deep into the ground to absorb as much moisture as they can.
- Extensive root systems prevent grazing animals from pulling roots out of the ground

TEMPERATE GRASSLAND PLANT ADAPTATIONS

- **Prairie grasses have narrow leaves which lose less water than broad leaves**
- **Grasses grow from near their base, not from tip, thus are not permanently damaged from grazing animals or fire.**
- **Many grasses take advantage of exposed, windy conditions and are wind pollinated.**
- **Soft stems enable prairie grasses to bend in the wind**

TEMPERATE GRASSLAND PLANT ADAPTATIONS



TAIGA PLANT ADAPTATIONS

TAIGA PLANT ADAPTATIONS

- Many trees are evergreen so that plants can photosynthesize right away when temperatures rise
- Many trees have needle-like leaves which shape loses less water and sheds snow more easily than broad leaves
- Waxy coating on needles prevent evaporation
- Needles are dark in color allowing more solar heat to be absorbed
- Many trees have branches that droop downward to help shed excess snow to keep the branches from breaking

TAIGA PLANT ADAPTATIONS



Plant Adaptations in Water

Plant Adaptations in Water

- Underwater leaves and stems are flexible to move with water currents
- Some plants have air spaces in their stems to help hold the plant up in the water
- Submerged plants lack strong water transport system (in stems); instead water, nutrients, and dissolved gases are absorbed through the leaves directly from the water.
- Roots and root hairs reduced or absent; roots only needed for anchorage, not for absorption of nutrients and water.

Plant Adaptations in Water

- some plants have leaves that float atop the water, exposing themselves to the sunlight
- in floating plants chlorophyll is restricted to upper surface of leaves (part that the sunlight will hit) and the upper surface is waxy to repel water
- Some plants produce seeds that can float

Plant Adaptations in Water



Tropical Rainforest Plant Adaptations

Tropical Rainforest Plant Adaptations

- Drip tips and waxy surfaces allow water to run off, to discourage growth of bacteria and fungi
- Buttresses and prop and stilt roots help hold up plants in the shallow soil
- Some plants climb on others to reach the sunlight
- Some plants grow on other plants to reach the sunlight
- Flowers on the forest floor are designed to lure animal pollinators since there is relatively no wind on the forest floor to aid in pollination.

Tropical Rainforest Plant Adaptations

- Smooth bark and smooth or waxy flowers speed the run off of water
- Plants have shallow roots to help capture nutrients from the top level of soil.
- Many bromeliads are epiphytes (plants that live on other plants); instead of collecting water with roots they collect rainwater into a central reservoir from which they absorb the water through hairs on their leaves
- epiphytic orchids have aerial roots that cling to the host plant, absorb minerals, and absorb water from the atmosphere

Tropical Rainforest Plant Adaptations





Thank You