



Adaptation of plants and animals

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Objectives

- Understand the concept of adaptation in plants and animals.
- Explore various examples of adaptations in both plants and animals.
- Discuss the significance of adaptations for survival and evolution.

What is adaptation?

Adaptation is the process by which organisms adjust to their environment to increase their chances of survival and reproduction.

It's a result of natural selection, where beneficial traits are favored over time.

Key Points:

Adaptation involves changes in an organism's structure, behavior, or physiology.

These changes occur over generations in response to environmental pressures.

Beneficial adaptations increase an organism's fitness, or ability to survive and reproduce.

Natural selection acts on variation within populations, leading to the preservation of advantageous traits.

What is Adaptation?

The process which enables organisms to adjust to their environment in order to ensure survival.



Adaptation in plants

Plants have evolved various adaptations to thrive in diverse environments. Here are explore some of these adaptations:

1. Structural Adaptations:

Structural adaptations involve modifications in **plant structures** for better survival.

Example: **Thorns**, **spines**, and **prickles** protect plants from herbivores.

These sharp structures deter animals from feeding on the plant, reducing damage and increasing survival chances.

Plant Armoury

Thorns



Crataegus sp.

- Modified stem
- Connected to vascular system
- Positioned over leaf scar

Spines



Berberis sp.

- Modified leaf
- Connected to vascular system
- Positioned under leaf scar

Prickles



Rosa sp.

- Part of the epidermis
- Not connected to the vascular system (so easy to remove)
- Positioned anywhere on the stem

Adaptation in plants

2. Physiological Adaptations:

Physiological adaptations are **internal processes that help plants survive** in their environments.

Example: **Succulent plants store water in their leaves** to survive in arid environments.

These plants have **specialized tissues that store water**, enabling them to withstand drought conditions and thrive in arid regions.



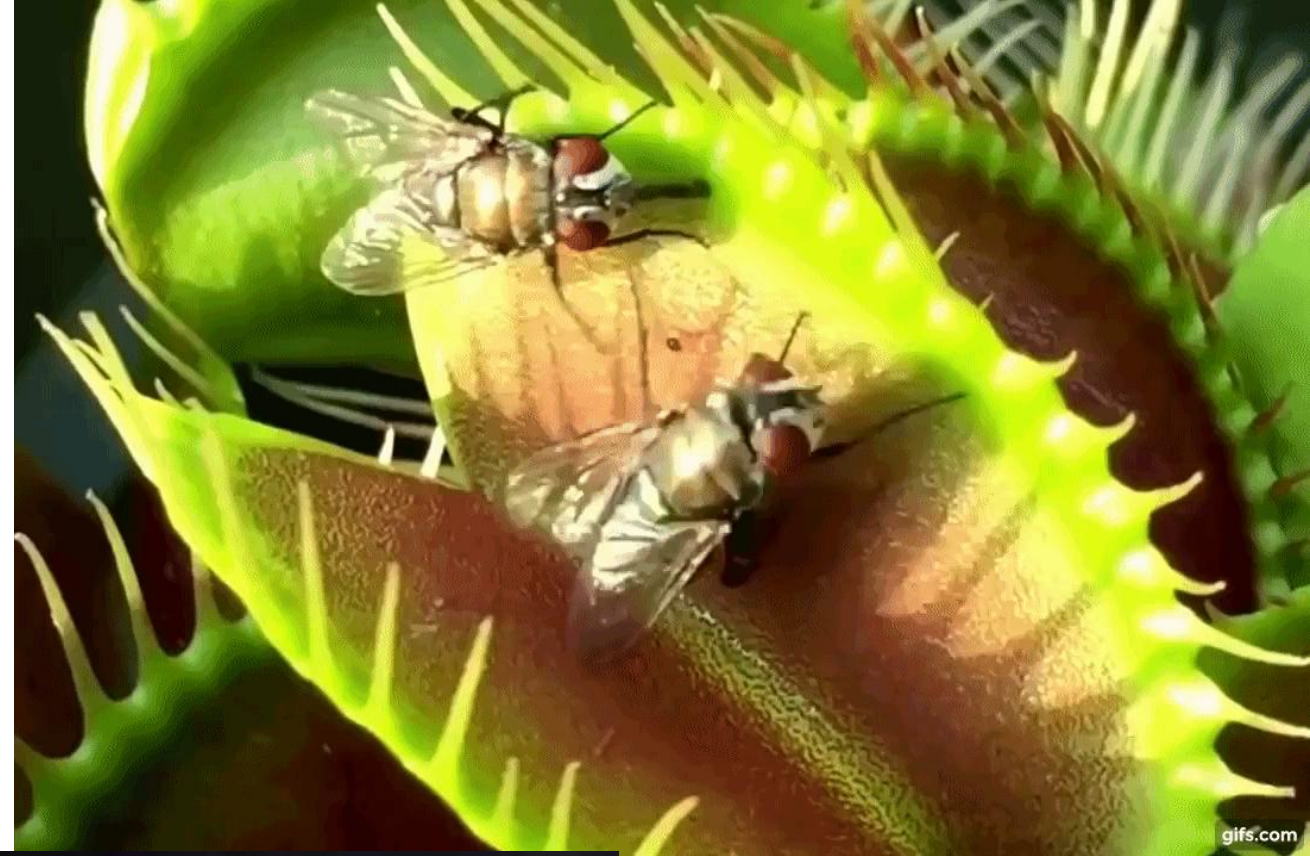
Adaptation in plants

3. Behavioral Adaptations:

Behavioral adaptations are **responses to environmental stimuli** that enhance plant survival.

Example: **Phototropism**, where **plants grow towards light** for optimal photosynthesis.

Plants **detect light** through **photoreceptors** and **grow towards it to maximize light absorption**, essential for photosynthesis.



Adaptation in animals

Animals exhibit a wide range of adaptations that enable them to thrive in their environments. Here are some of these adaptations:

1. Structural Adaptations:

Structural adaptations are **physical features** that help animals survive.

Example: **Camouflage in chameleons** helps them blend into their surroundings.

Chameleons can change the color of their skin to match their environment, providing camouflage and allowing them to avoid predators.



Adaptation in animals

2. Physiological Adaptations:

Physiological adaptations are **internal functions** that aid survival.

Example: **Hibernation allows animals to conserve energy** during harsh conditions.

Animals like **bears and hedgehogs** enter **a state of reduced metabolic activity** during winter, conserving energy and surviving when food is scarce.



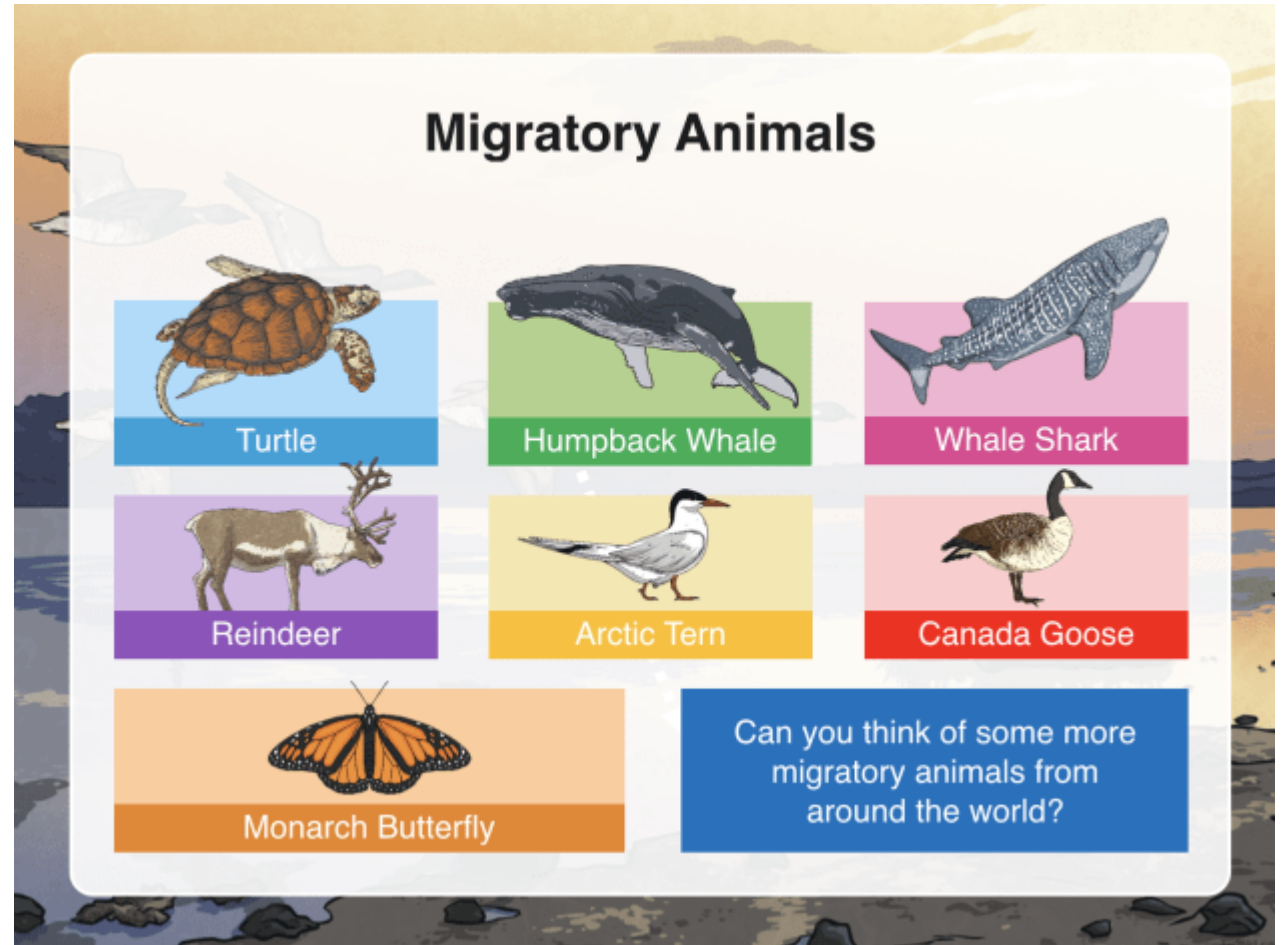
Adaptation in animals

3. Behavioral Adaptations:

Behavioral adaptations are **actions animals take** to enhance survival.

Example: **Migration** enables **animals to find better food sources** or climates.

Birds, mammals, and fish migrate seasonally to access **resources like food and breeding grounds**, optimizing their chances of survival.



Other examples of adaptation

Polar Bear: **Thick fur** and **blubber** for insulation in cold climates.

Cactus: **Succulent stems** and **shallow roots** to **conserve water** in arid environments.

Giraffe: **Long neck** for **reaching high branches** for food.

Arctic Fox: **White fur** for **camouflage** in snowy habitats.

