

ADAPTATION EXPLORATION

Self-guided Program: Teacher's Guide (Grades K-4)

Introduction

Adaptations are features, traits, or characteristics that help an organism survive and thrive in its environment, and can be classified as structural or behavioral.

Students will understand

- Living things have adaptations that help them survive and reproduce in their environment
- Adaptations can be either structural or behavioral

Vocabulary

Structural adaptation: Physical features of an organism, such as an owl's eyes, or a rose's thorns.

Behavioral adaptation: Instinctive or learned activities such as migration and tool use.

Procedure

1. Working in groups of 2 or 3, have students search for the plants, animals, or specific adaptations in the activity.
2. Conduct the activity as you walk through the Garden OR stop for several moments at different locations

Suggested areas:

- Fragrance Garden
- Rose Garden
- Heron Lake
- R. Roy Forster Cypress Pond / Floating Bridge
- Perennial and Black Garden

Introductory Questions

1. How do local plants and animals depend on their environment?
 - For food, water, and shelter/habitat
2. Why can you find different adaptations in different environments across the world?
 - Each ecosystem presents unique environmental challenges (temperature, terrain, interactions between species, etc). When an organism is trying to meet its food, water, and habitat needs, it will be more successful if it has evolved ways to adapt to its environment.

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3. What are some ways adaptations benefit plants and animals?

Being well adapted to an environment allows an organism to effectively:

- Hunt for food or evade predators
- Attract pollinators
- Reproduce
- Withstand challenging environmental conditions (extreme temperatures, water availability, etc)

Summarizing Questions

1. What is the most interesting structural or behavioral adaptation you saw in the Garden? Describe how the plant or animal benefited from its adaptation.

2. What are some environmental conditions that animals living on the coast of British Columbia must be adapted to in order to survive? Think about our climate in Vancouver.

- Cool winters
- Decreased food availability in fall and winter months
- High levels of precipitation
- Many ponds and lakes freeze over in winter

3. Do humans have any adaptations?

- Language- Communicating through sound
- Animal intelligence- Humans have developed culture, language, and the ability to use tools; all powerful skills
- Teeth- We have teeth that allow us to have an omnivorous diet (molars for grinding, and canines for tearing)
- Social behavior- We typically like to live in groups (families) which makes it easier for us to support each other
- Opposable thumbs- A great adaptation that helps us do so many things!



See page 3 for additional notes to aid student discoveries

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Student Activity - Additional Notes

Pond Adaptations

GUNNERA

Thick, rough leaves and large prickles protect the plant against predation.

BALD CYPRESS

Cypress “knees” are root projections which provide extra stability in swampy/soft soil.

RED-EARED SLIDER

These turtles brumate (a type of hibernation) during winter months. They lay motionless at the bottom of a pond, do not eat, and they drop their breathing rate by up to 80%.

WATER LILY

The leaves and stems of water lilies contain tiny air pockets, which keep the plant afloat. Just like a life jacket!

DRAGONFLY

A narrow, aerodynamic body shape allows these insects to fly and change direction quickly. Four long wings beat fast to create speed.

MALLARD DUCK

Ducks have an oil gland at the base of their tail, and spread the water-resistant oil over their feathers while preening. Tiny “barbs” in feathers help keep a tight surface as well.



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General Plant and Animal Adaptations

MIGRATION

Organisms migrate to search for food or more favourable living or breeding conditions. Species such as the Rufous hummingbird, and sandhill crane migrate.

WAXY LEAVES

Thick, waxy leaves reduce water loss in plants. This is important in environments with little rainfall and/or high temperatures such as a desert or rainforest.

HAIRY LEAVES OR STEMS

Plant “hair” (trichomes) help insulate against cool temperatures, reduce water loss, and discourage pests and predators.

COLOURFUL FLOWERS

The color and scent of flowers attracts pollinators, which is vital for successful reproduction.

DROOPING BRANCHES

Many species, including: subalpine fir, mountain hemlock, and white spruce exhibit this shape.

CAMOUFLAGE

Camouflage helps organisms avoid predators, and/or sneak up on prey.

FOOD STORAGE

Look for eastern grey squirrels and Stellar jays storing food in the fall months to sustain them over winter.

FURROWED BARK

The thick, furrowed bark of some trees help protect against the damaging effects of wildfire. A large giant redwood tree’s bark can be up to 2 feet thick.