

Habitat Comparison at the Garden

Several types of habitats are represented at the Atlanta Botanical Garden: tropical rainforest, desert, temperate deciduous forest and wetlands. During this activity students will make observations on two or more of these habitats and evaluate how each habitat is unique.

Materials

- Copies of Habitat Comparison Worksheet
- Writing utensil
- Clipboards

Background

Below is a description of different habitats that are represented at the Atlanta Botanical Garden. Use this information to assist students with completing the Habitat Comparison Worksheet during your visit and with follow-up discussions.

Georgia's Temperate Deciduous Forest

(Storza Woods and Southern Seasons Garden)

A Temperate Deciduous Forest is a habitat defined by four seasons, moderate amounts of precipitation and trees that lose their leaves in the fall called deciduous trees. The average temperature in a Temperate Forest is 50°F and the habitat receives approximately 30-60 inches of precipitation per year. Temperate Forests are usually shady because of the large tree canopies that prevent most of the sunlight from reaching the forest floor. On the other hand, more sunlight is able to reach the forest floor during the winter when most trees do not have any leaves.

There are 4 distinct seasons in a temperate deciduous forest. During the fall the trees lose their leaves and in the spring they re-grow them. Before losing their leaves in the fall, the leaves change color to yellow, red, brown and orange. Scientists believe the color change is due to the decreased amount of daylight in the fall, which causes the leaves to stop producing a green pigment called chlorophyll that is used during photosynthesis. As the winter months approach, the days get shorter and there is not enough sunlight or water for photosynthesis to occur. Since the tree is no longer making food, chlorophyll is no longer needed. Although most trees' leaves change colors, there are some trees with leaves or needles that remain green throughout the year. These are called evergreen trees.

Many woodland creatures live in Storza Woods and in the Southern Seasons Garden at the Atlanta Botanical Garden, including squirrels, raccoons, chipmunks, opossums, birds, and turtles. Squirrels are one of the most common animals seen at the Atlanta Botanical Garden during the day. They are omnivores and will eat many things in the forest such as fungus, insects, acorns from oak trees, and other kinds of fallen nuts and fruits.



Habitat Comparison at the Garden

Tropical Rainforest

(Fuqua Conservatory and Fuqua Orchid Center)

Tropical rainforests are located near the equator where they have warm, sunny, 12 hour days throughout the year. In fact, the average temperature is 70 degrees Fahrenheit in a tropical rainforest versus 61 degrees Fahrenheit in Atlanta. Rainforests are wet habitats that receive approximately 90 - 400 inches of rainfall per year. The constant warmth, sunlight and rain make rainforests an ideal place for plants to grow.

A tropical rainforest is usually a shady habitat with lots of trees with large canopies. The tree canopies only allow approximately 2% of sunlight to reach the forest floor. In order to cope with scarce sunlight, many rainforest plants have developed adaptive traits that enable them to capture the maximum amount of sunlight such as gigantic leaves, dark coloring, and unique growing behaviors. In the rainforest larger plants have a better chance of receiving sufficient sunlight. As a result, many rainforest species have extremely large leaves that in turn block sunlight to smaller species on the forest floor. Rainforest leaves that are dark green or sometimes reddish colored can absorb more sunlight than leaves that are light green, because darker colors absorb sunlight better than lighter colors (think of wearing a white shirt versus a black shirt on a sunny, hot day).

Some rainforest plants obtain sunlight by growing higher up in the tree canopy. Vines and epiphytes get a boost up to the sunlight by growing on another plant. Epiphytes are not parasitic like vines. They grow on a branch without strangling or removing nutrients from their host plant. On the other hand, vines wrap themselves around their host plant and block it from receiving sunlight or growing. Look around the rainforest; can your group see different kinds of epiphytes and vines?

Desert

(Desert House in Fuqua Conservatory and Hardy Succulents)

Desert habitats are harsh, dry environments that receive very little rainfall (about 10 – 25 inches of rainfall a year). Due to the lack of precipitation, a desert habitat cannot support many large plants with thick canopies that would block sunlight, such as those in a temperate or tropical forest. Consequently, deserts are bright and sunny habitats.

Many desert plants have adapted to lots of sunlight and little water by producing small, waxy, and light green leaves. Large leaves tend to release more water than smaller leaves and they require more energy to grow. Since it is not necessary for desert plants to produce large leaves to capture sunlight, they can conserve energy and water by producing smaller leaves. The waxy leaves also help prevent water from escaping the leaves by providing a protective coating that holds water inside the plant. Light green leaves act as sunscreen and prevent the plant from absorbing too much sunlight. Those adaptations help desert plants survive in the harsh desert climate.

Succulent desert plants survive with the lack of water by storing water in their leaves, roots or stems. The stored water is sought after by many desert creatures. As a result, desert plants try to



Habitat Comparison at the Garden

protect themselves from thirsty predators with hairs, spines and poisonous sap. Beyond providing protection against predators, spines also cast shadows on the stem that help reflect the sun's rays away from the plant. The succulents in the Desert House have pointy spines and poisonous sap, so please avoid direct contact with those plants.

Wetland

(Native Bog Garden)

Wetlands are wet habitats that have moist, saturated soils and water tolerant plants. There are many types of wetlands found all over the world including swamps, bogs, marshes and peat lands. In fact, 13% of Georgia's land area is considered a wetland. This scavenger hunt is a study of a southeastern bog. Keep in mind that other wetlands can have different characteristics and plants.

Carnivorous plants are plants that trap and digest bugs, insects and sometimes animals. They typically live in nutrient poor soils like wetlands and supplement their diet with insects. The Native Bog Garden at the Atlanta Botanical Garden has several different kinds of southeastern carnivorous plants including pitcher plants, sundews and Venus fly traps. These plants die back in the wintertime which makes them more difficult to find during the colder Atlanta months, but in the springtime, visitors are treated to beautiful blooms on the carnivorous plants.

Procedure

- During your visit to the Atlanta Botanical Garden, visit two or more of the different habitats: temperate deciduous forest, tropical rainforest, desert and wetland. At each location, have the students complete the corresponding worksheet.
- Discuss the results at each location. Did everyone observe the same thing? Why or why not? What kinds of plants did they find interesting in each space?
- While in each habitat, ask the students to show you and the group examples of the plants that fit each habitat's characteristic. For example: in the tropical rainforest, where did they see a leaf bigger than them? In the desert, where did you find a plant with spines? Ask the students to brainstorm why plants have those characteristics in each habitat. For example: why do they think leaves are big in the rainforest and why do they think desert plants have spines?

Follow-up

- When you return to school evaluate how each habitat is different. What habitat had the most sun and why? How did each habitat feel different? Which habitat was the driest? Why did it feel dry? Which habitat was the most humid? Why do they think it felt humid?
- Assign groups different habitats to research. Ask them to find habitat specifics like precipitation, common weather patterns, types of vegetation, types of soil etc. and have them present their findings to the class. How was their research the same or different from their results at the Garden?



Temperate Deciduous Forest Activity

Southern Seasons Garden or Storza Woods

Name: _____ Date: _____

While visiting an example of the habitat below at the Atlanta Botanical Garden, answer these questions. After visiting this habitat discuss how it is different from other habitats at the Garden.

Find an interesting plant and draw it in the space below.

Describe the plant you chose to draw: _____

Is it sunny or shady in the forest? _____

Can you find a tall tree? YES NO

Can you find a tree that stays green year round? YES NO
(These trees are called evergreen trees)

Do most trees have leaves on them? YES NO

Is it winter, spring, summer or fall? _____

How does the season affect the appearance of the trees? _____

Write a brief description of the temperate deciduous forest habitat based on your observations:



Tropical Rainforest Activity

Fuqua Conservatory and Fuqua Orchid Center

Name: _____ Date: _____

While visiting an example of the habitat below at the Atlanta Botanical Garden, answer these questions. After visiting this habitat discuss how it is different from other habitats at the Garden.

Find an interesting plant and draw it in the space below.

Describe the plant you chose to draw: _____

Is it sunny or shady in the Tropical Rotunda? _____

Can you find a leaf bigger than you? YES NO

Can you find a leaf with red undersides? YES NO

Can you find a vine growing on another plant? YES NO

Can you find a plant growing on another plant? YES NO

Why would a rainforest plant grow on another plant? What can it get in the treetops that it might not get on the ground? _____

What is the temperature like in the Tropical Rotunda? _____

Is the air in the Tropical Rotunda thick and humid or dry? _____

Write a brief description of the rainforest habitat based on your observations: _____



Desert Activity

Desert House in the Fuqua Conservatory

Name: _____ Date: _____

While visiting an example of the habitat below at the Atlanta Botanical Garden, answer these questions. After visiting this habitat discuss how it is different from other habitats at the Garden.

Find an interesting plant and draw it in the space below.

Describe the plant you chose to draw: _____

Is it sunny or shady in the Desert House? _____

Do plants generally have big leaves or small leaves? BIG SMALL

Can you find a plant with spines? YES NO

Why do you think some desert plants have spines? _____

Can you find a plant with thick, juicy leaves? These are called succulents. YES NO

Why do you think succulents have thick juicy leaves? Why are many desert plants succulents?

What is the temperature like in the Desert House? _____

Is the air in the Desert House thick and humid or dry? _____

Write a brief description of the rainforest habitat based on your observations: _____



Wetland Activity

Native Bog Garden outside the Fuqua Orchid Center

Name: _____ Date: _____

While visiting an example of the habitat below at the Atlanta Botanical Garden, answer these questions. After visiting this habitat discuss how it is different from other habitats at the Garden.

Find an interesting plant and draw it in the space below.

Describe the plant you chose to draw: _____

Is it sunny or shady in this wetland? _____

Feel the soil. Is it moist or dry? _____

Are there any flowers blooming in the wetland? YES NO

If yes, what color are they? If no, why do you think there are not any flowers in bloom?

The Native Bog Garden at the Atlanta Botanical Garden has many carnivorous or bug eating plants that are native to the southeastern United States, such as pitcher plants and Venus fly traps.

Can you find one of these plants? YES NO

If yes, look inside the carnivorous plant.

Can you see a trapped insect or insect skeleton? YES NO

Write a brief description of the rainforest habitat based on your observations: _____

