

Self-Guided Visit: *Forest Forays*



TEACHER GUIDE

Welcome to The New York Botanical Garden! *Forest Forays* explores the ecology of forests. This visit and the accompanying reproducible student activity sheets are recommended for use with 6th–8th grades. The activity sheets for *Forest Forays* address New York State Science Standards 1 and 2 and New York City Science Performance Standards S2a, S2d, S2e, S5b, S5c, S5f, and S7a.

FOREST FACTS

What is a forest?

A forest is a type of ecosystem that is dominated by trees. An ecosystem is all the interacting living organisms (such as plants, animals, fungi) that make up the biotic community and non-living—or abiotic—things (such as rocks, soil) in a given area. An ecosystem is stable when the living organisms are balanced with their environment. This balance is achieved through interactions such as predation, parasitism, and competition. Therefore, a forest remains a forest as long as the balance of these interactions remains intact.

What is biodiversity?

Biodiversity refers to the variety or diversity of living things in a particular place. Different species—or kinds—of plants, animals, fungi, and microscopic living things are all important, since each helps the ecosystem function in different ways. Biodiversity is an important indicator of the health of an ecosystem; when the level of biodiversity of an ecosystem is lowered, the ecosystem becomes less healthy.

How can biodiversity be assessed?

The biodiversity of a large area can

be estimated by first assessing the biodiversity of a small area. To do this, one must classify and count the living species in the given area. During the *Forest Forays* self-guided visit, your students will classify and count the trees in a small section of the Forest in order to make general inferences about the biodiversity and health of the Forest at the Botanical Garden.

How are trees classified?

A good way to classify trees is by using a dichotomous key based on morphological (physical) characteristics of the tree's leaves. Keys work by taking a group of things and dividing it into smaller and smaller categories until each thing is in its own category. Dichotomous (divided into two parts) keys always give two choices in each step. The series of choices lead the user to the correct name of a given item. You and your students will use a simple dichotomous key to identify trees in the Forest.

BEFORE YOUR VISIT

Read through the *Forest Forays* activity sheets to become familiar with the leaf morphological terms, and to learn how to follow dichotomous key.

Bring copies of the *Forest Forays* activity sheets for each student. Each student will also need a pencil and something to lean on (such as a clipboard) while they write.

Review your goals and students' expectations several days before the trip and again the day before. Remind students to dress appropriately for spending time outdoors.

SUGGESTED ROUTE

Use the instructions below as well as your School Group Map and the directional signs posted throughout the grounds to help facilitate your tour. Estimated walking times between each destination are noted.

Note: *The Forest Trail has moderate slopes throughout. Please come prepared with appropriate foot wear.*

1. After you check in at the School Group Check-In booth, encourage your group to use the restrooms and water fountains before you begin your journey.

2. Follow the signs to the **Clay Family Picnic Pavilions**, stay to the left on the paved pathway and walk past the picnic pavilions, which will

be on your right (*estimated walking time is 2 minutes*). You can stop here for lunch at this point, or at the conclusion of your self-guided visit.

3. Stay on the left path where the trail forks, and follow the **Mitsubishi Wild Wetland Trail**. Take a left at the Gazebo, and continue walking along the **Mitsubishi Wild Wetland Trail** to the end.

4. Walk straight, crossing the road, to the entrance of the **Forest Trail**. There is a map of the Botanical Garden marking this entrance point.

5. Walk along the **Forest Trail** (stay straight on the main trail). Be sure to pause at the base of the stone steps to look at the Bronx River below, the only freshwater river in New York City.

6. At the base of steps, turn right on the trail (without crossing **Hester Bridge**). Follow the trail to the end, exiting the Forest (*estimated walking time is 30 minutes*). As you make your way along the trail, help your group complete the **Forest Forays** activity sheets described below.

7. Make a left onto the main paved road (**Azalea Way**) and follow this to the three way intersection. Turn right and follow the sign for **Daffodil Hill Way**. Follow this main road back up to the **School Group Exit**, the beginning of your journey! (*Estimated walking time about 10 minutes*). Restrooms and the **Clay Family Picnic Pavilions** are in this vicinity as well.

STUDENT ACTIVITIES

When you enter the Botanical Garden, explain to your students that they are going to study the diversity of trees in the Forest. Remind students that all leaves, seeds, fruits, and cones must stay in the Garden. You may allow students to carry leaves with them as they explore, but please remember to return them!

1. Activity Sheet #1:

Leaf Morphology

Once inside the Forest, explain the term “morphology” and discuss the different terms illustrated on the activity sheet. Use a leaf that you find to help review this new vocabulary. Direct students to locate leaves to sketch and describe on their activity sheets.

2. Activity Sheet #2:

Biodiversity

Discuss the concept of biodiversity and its importance to the health of an ecosystem with your class. Guide your students through the process of following the dichotomous key, using an actual leaf as an example. Divide the class into pairs, and assign each pair a small area (with about ten trees) within which to complete their identification task. When this task is completed, help facilitate grouping the pairs together to discuss and compare results.

3. Challenge your students to discuss their findings—what, if anything, did their data tell them about the level of biodiversity in the Forest?

AFTER YOUR VISIT

Use the data gathered during your trip to create a class graph. How many different trees were counted all together? How many different types of trees were found all together? What kind of tree was

the most common? What was the least common? What does the combined data say about the diversity of trees in the Forest? If data was collected in another area of the Forest, would the results be the same? Why or why not?

Compare the Forest you visited to other ecosystems, such as wetlands, tropical rain forests, or deserts. How are the plants and animals that live there different? How are they the same?

Choose a small neighborhood park or playground, and use field guides and or keys to identify the plants, trees, and/or animals that you find. Use books and the Internet to identify the scientific and common name for each species, as well as relevant information such as the range and lifecycle of each. Categorize and compile the information as a field guide for this natural spot, including a photograph and/or careful sketch of every species. Press the leaves from plants in between pages of a heavy book to create a herbarium (plant library) of dried specimens. If possible, produce extra copies of the field guide to keep in your classroom and/or school library.

RECOMMENDED TEACHER RESOURCE

Roa, Michael L. *Environmental Science Activities Kit*. San Francisco: Jossey-Bass, 1993.

RECOMMENDED BOOKS FOR CHILDREN

Art, Henry W., and Robbins, Michael W. *Woods Walk*. North Adams, Mass.: Storey Books, 2003.

Fielding, Eileen. *The Eastern Forest*. Tarrytown, N.Y.: Marshall Cavendish, 1999.