Budding Botanists
EDUCATOR GUIDE

Thank you for registering for the Budding Botanists field trip at New England Botanic Garden at Tower Hill. This guide provides an overview and introduction to the program. The optional pre- and post-visit activities on the following pages will support your students' learning during the program and will help to extend their knowledge beyond your trip. Prior to your visit you are not mandated to complete any specific lessons or units of study.

WHAT'S INSIDE

Overview

During this guided program your students will get up close and personal with plants of all shapes and sizes. Students will learn about the parts of a plant and what all plants need to survive as they tour the gardens and participate in hands-on activities. We recommend you complete the pre- and post-visit activities on the following pages to enhance your visit and support the classroom integration of the concepts addressed during this program.

Throughout the 90-minute field trip, Teacher Naturalists will guide small working groups of up to 15 students through the gardens and trails. Students will be encouraged to make observations, explore, and ask questions throughout. Each student will be provided with a hand lens, clipboard, and field notebook to use during their visit. Teacher Naturalists will engage students using stories, investigations, experiments, and games.

Learning Objectives

Students will...

- Recognize the basic parts of a plant and how each part helps the plant survive.
- Know the four things all plants and animals need to survive (food, water, space, and air).
- Compare and contrast plants that they observe during their field study.

Background

Most plants have roots, stems, and leaves that help the plant to survive. To survive plants and animals need food (nutrients), water, and air. In addition to that plants also need light and space. Plants use their different parts to gather what they need to survive. Some plants also have flowers that attract pollinators to produce seeds that will grow into plants. Most plants grow from seeds. Germination is the process of giving a seed water and sunlight to make it sprout roots and a leaf.

Vocabulary

Plant: a living thing that makes its own food from sunlight, carbon dioxide, and water.
Seed: the part of a plant that grows into a new plant. Seeds come from the flower.
Root: the part of the plant that is usually hidden underground. The roots collect water and nutrients.
Stem: grows out from the ground, supports the rest of the plant, and transports nutrients and water.
Leaf: grows from the stem or branches and collects sunlight and air to help make food for the plant.
Flower: the part of the plant that blossoms; once a flower is pollinated it can grow seeds.
Fruit: grows from the flower and contains seeds. Fruits can be fleshy (apple) or dry (nut).
Survive: to be alive and healthy.
Nutrients: something that provides food or vitamins to a living organism.
Germination: when seeds begin to sprout roots and leaves after getting water and sunlight.
Observation: something we notice with our five senses.

IN ALLIGNMENT WITH THE 2016 MASSACHUSETTS SCIENCE AND TECHNOLOGY/ENGINEERING CURRICULUM FRAMEWORKS

Standards

KINDERGARTEN

- K-LS1-1. Observe and communicate that animals (including humans) and plants need food, water, and air to survive. Animals get food from plants or other animals. Plants make their own food and need light to live and grow.
- K-LS1-2. Recognize that all plants and animals grow and change over time.

GRADE 1

- 1-LS1-1. Use evidence to explain that (a) different animals use their body parts and senses in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air, and (b) plants have roots, stems, leaves, flowers, and fruits that are used to take in water, air, and other nutrients, and produce food for the plant.
- 1-LS3-1. Use information from observations (first-hand and from media) to identify similarities and differences among individual plants or animals of the same kind.

Pre-Visit Activity Guide

The following optional pre-visit activities and resources are designed to support the understanding of concepts that will be addressed during the Budding Botanists program.

LEAF IDENTIFICATION GUIDE

Students will make a class plant guide to document the plants in their school yard or plants that they cut out and collect from images in magazines.

MATERIALS

Paper
Magazines
Scissors
Glue
Crayons

Brainstorm as a class the different types of plants you might find growing outside. Write down responses and create a class list of plants. Explain that there are thousands of different plant species and scientists create field guides to show the types of plants and what makes them similar and different. Today we are going to create a class plant field guide to document the plants that live around our school (alternatively you can use magazines or photos).

Each student will choose one plant and create their own page for the class plant guide.

1. Take students outside on a plant hunt. Have each student pick up a leaf to bring back to class.
2. Give each student a piece of paper and have them paste their leaf or do a leaf rubbing.
3. Ask students to share their observations about color, shape, and texture of their leaf.
4. As a class, work together to identify the plant that each leaf came from.
5. Display the class plant guide around the room and talk about similarities and differences of the leaves.

PLANT PRINTS

Students will learn about fruits and vegetables, eat a healthy snack, and make plant prints using the leftover food scraps.

MATERIALS

Paper
Paint
Plates
Fruits & Veggies

Read 'A Fruit is a Suitcase for Seeds' by Jean Richards. Ask students what a seed is and where they come from. Explain that most seeds come from the fruit of a plant. Open some common fruits with seeds inside (watermelon, apple, peach). Explain that a fruit is anything that contains a seed including some we call vegetables like peppers, tomatoes, and cucumbers. Use toy foods or pictures to sort into two categories - fruits or vegetables - by guessing whether or not the food has seeds. Further classify by identifying the part of the plant we eat (fruit, root, stem, seed, etc.).

Cut up different fruits and vegetables and have students use their five senses to make observations. Have a healthy snack of fruits and vegetables and do a taste test, categorizing the plants by sweet or not sweet.

Save the plant scraps left from snack and use them to make prints with washable paint.

1. Collect rinds, carrot tops, pits, and any other unused plant parts.
2. Place food scraps on tables and pass out plates with washable paints.
3. Give each student a piece of paper and demonstrate how to dip the end of the food scrap into the paint and press it against their paper to make a print.
4. Have students print until their paper is full.
5. Display the prints and discuss as a class which scraps worked best for printing and whether they came from a fruit or vegetable.

Post-Visit Activity Guide

The following optional post-visit activities and resources are designed to reinforce concepts that were addressed during the Budding Botanists program. We would love to see your students' work! Please share with us by mail or email us at youtheducation@nebg.org

GROWING JOURNAL

Students will practice math and literacy skills as they track the growth of their seed that they germinated after the Budding Botanists field trip.

MATERIALS

Paper
Stapler

Ruler
Pencils
Growing Seed Kit

Pass out student seed in a bag experiments that were set up during the field trip. Work with students to find a place to hang in the classroom. Review what seeds need to germinate and grow. Discuss where they may grow best. Have some students place seeds near a window and others place them in a dark area and make a hypothesis on which seeds will grow best. Create growing journals for students to track their seed's growth.

1. Provide each student with 2-6 pieces of copy paper and fold in half to make a booklet.
2. Use card stock or cut cereal or cracker boxes to create a recycled cover.
3. Rubber band or staple together.
4. Decorate journals with scrap paper, markers, stickers, and more.

Every few days dedicate 30 minutes to check on the seeds. Have students draw their seed, take measurements of the parts of the plant as it grows (roots and shoots), and label their drawings with the correct measurements.

FLOWER MODELS

Students will make their own flower models with salt dough, inspired by the plants they saw during the Budding Botanists field trip.

MATERIALS

Bowl
Flour
Salt
Food Coloring

Review the parts or a plant (roots, stem, leaves, and flower) and their purpose with students. Explain that they will be creating their own plant that has all of these parts and they will be using salt dough to sculpt their own model of a flowering plant.

1. Make the salt dough as a group. Add 2 cups flower, 1 cup salt, 1 cup water, and stir to combine.
2. Separate dough into smaller portions and color with food coloring.
3. Give students a piece of card stock or a paper plate to sculpt their models on.
4. Let students select small pieces of different colored salt dough for their creations.
5. Challenge students to build all the four main parts of the their plant (root, stem, leaves, and flower).
6. Have students label their plant parts and write the name of their plant on their plates.

EDUCATOR RESOURCES

- Garden Adventures: Exploring Plants with Young Children by Sarah Pounders
- Sowing the Seeds of Wonder: Discovering the Garden in Early Childhood Education by Erika Perloff, Amy Carlson, & Jill Begin
- A Pocket Naturalist Guide: Massachusetts Trees and Wildflowers by James Kavanagh

STORY BOOKS

- From Seed to Plant by Gail Gibbons
- Plantzilla by Jerdine Nolan
- Plant Secrets by Emily Goodman
- A Fruit is a Suitcase for Seeds by Jean Richards