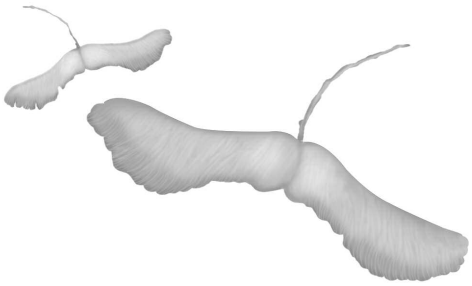
THE NEW YORK BOTANICAL GARDEN

Self-Guided Visit: *Color Me Autumn*



Teacher Guide

Welcome to The New York Botanical Garden! ***Color Me Autumn*** is a self-guided visit that explores seasons and how they affect the plant life cycles. This visit and the accompanying reproducible student activity sheets are recommended for use with 2nd–4th grades. The activity sheets for ***Color Me Autumn*** address New York State Science Standards 1 and 2 and New York City Science Performance Standards 2a, 2b, 2c, 2d, 5a, 5b, 5c, and 5f.

Leaf Facts

Why are green leaves so special?
Chlorophyll is the green pigment in leaves. During the process called photosynthesis, chlorophyll uses the sun's light energy to convert water and carbon dioxide into sugar—food for the plant—and oxygen (which is released). In this way, plants have the amazing ability to make their own food.

What happens to leaves in autumn?
As days become shorter, the plant forms a layer of tissues that walls off the water supply from the stem to the leaves. Once this layer is complete, the leaves fall off of the tree.

What causes the leaves to change colors?
As the green chlorophyll in the leaves is used up or breaks down, other colors become visible. The yellow and orange colors are evidence of other pigments that were actually already in the leaves. Red and purple pigments are formed when excess sugars break down. Eventually all leaves turn brown as they decay.

Before Your Visit

Bring copies of the three ***Color Me Autumn*** student 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

Utilize the instructions below as well as your Visitor Map and the directional signs posted throughout the grounds, to help facilitate your visit. You might want to highlight your route on your map as you go. Estimated walking times between each destination point are noted.

1. Orient your group at the Leon Levy Visitor Center. Encourage your group to use the restrooms and water fountains here before setting off.

2. When facing the Reflecting Pool, bear right and walk past the entrance to the Everett Children's Adventure Garden to the entrance of the 50-acre native Forest *(estimated walking time 10 min.)*. There is a map of the Botanical Garden marking this entrance point.

3. Walk along the Forest Trail past the High Bridge, to the end of the trail at Azalea Way *(estimated walking time 30 min.)*. As you make your way along the trail, help your group complete the ***Color Me Autumn*** activity sheets described below.

4. Make a right onto Azalea Way, and make a left when you see a stand of beech trees on your left (hint: the smooth bark makes these trees unfortunate victims of carved graffiti). Stay to your left to get to the Clay Family Picnic Pavilions *(estimated walking time 7 min.)*, the only designated area for picnicking.

5. After lunch, follow the Mitsubishi Wild Wetland Trail to the end. Make a left and head back to the Leon Levy Visitor Center *(estimated walking time 7 min.)*—the beginning of your journey!

Student Activities

When you enter the Botanical Garden, explain to your students that they are going to make observations

about the colorful changes of fall. 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 the Botanical Garden, but please remember to return them!

1. Activity Sheet #1:
An Autumn Rainbow
As you walk with your class, look for an area with many colored plants or trees. Direct students to sketch part of this area, and to indicate where different colors are found in their sketch. Have students focus by looking through a rolled-up activity sheet. Include water or sky to expand the color range in their sketches.

2. Activity Sheet #2:
Describing Details
Guide students through the process of selecting one plant to observe, and recording the different colors of the plant's parts. As you continue your walk, have everyone look for the various colors of stems, bark, and leaves. Write down any colors that you find that are not listed. Challenge the students to think about the direction of color change in leaves. Although there is no one right answer to this question, it is an interesting opportunity to practice applying observations to hypotheses.

3. Activity Sheet #3:
Color Changes
Gather your group in a quiet spot, and encourage them to record their ideas for why the leaf colors change, the most colorful plant they observed at the Botanical Garden, and predictions for future color changes.

4. If you and your class have collected any leaves along the way, try arranging them in sequence from greenest leaf to brownest leaf, sorting them into different groups based on patterns, shapes, or colors.

After Your Visit

Have students use their observations from the Botanical Garden to create a mock magazine cover about autumn. Students can use real magazine covers as guides and use their written observations to produce a short "article" about their trip for the magazine.

Make a color wheel on a paper plate. Attach an arrow in the center, and spin to choose a color for your students to search for in a given area (classroom, outside, etc.).

Challenge students to write a poem or song about the colors they observed at the Botanical Garden and read or sing it.

Have students press fallen leaves between newspaper under a heavy book for a week. Does the color change? Encourage students to try identifying the trees that the leaves came from.

Recommended Teacher Resources

Burns, Diane L. *Trees, Leaves and Bark (Take Along Guide).* Menetonka, MN: NorthWord Press: 1995. A range of local trees are simply identified by descriptions of their leaves, bark, and seeds. Interspersed are easy tree-related activities for kids.

Hunken, Jorie. *Botany for All Ages: Discovering Nature Through Activities for Children and Adults.* Old Saybrook, CT: The Globe Pequot Press, 1993 (2nd ed.). This selection of straight forward plant-based activities makes it easy to introduce a wide range of botany concepts to students of all ages.

Recommended Books for Children

Thomas Locker. *Sky Tree.* New York, NY: HarperCollins Publishers, 2001. Detailed paintings follow the many seasonal changes of a tree over the course of a year.

Maestro, Betsy. *The Why do Leaves Change Color?*. New York, NY: Harper Collins Publishers, 1994. This book explores the diversity of leaves, the role they play in the life cycle of trees, and how they are affected by the changing conditions of the seasons.