

# Welcome!

Dear Teacher:

Thank you for planning a field study to Fairchild Tropical Botanic Garden. The tour you have selected, **Living With Plants**, is designed to teach students about the importance of plants in our lives and to inspire a lifetime appreciation of nature.

Your visit will include a guided walking tour through the garden during which students will participate in many hands-on activities. A tram tour through the entire garden may include a visit to one of the lakes to look for wildlife. Lunch will be followed by a plant propagation lesson so that each student will take home a botanical souvenir.

This packet of activities contains pre and post-visit resource materials to support the learning experience. **We strongly encourage you to review and use these materials to make the most of your students' field study at Fairchild.** The activities correlate to Florida's Next Generation Sunshine State Standards for grades K to 2. **Please be sure that each teacher attending the field study receives an activity packet.** Feel free to make additional copies of this packet as needed, or visit [www.fairchildgarden.org/education](http://www.fairchildgarden.org/education) to view the activities online.

The **word list** provided is especially important for students to study prior to their visit. An understanding of the vocabulary will be a great asset in comprehending the concepts discussed during the field study.

We look forward to your visit to Fairchild Tropical Botanic Garden and hope that you and your students will have an exciting and educational adventure.

Kind Regards,

*The Explorer Team*

Fairchild Tropical Botanic Garden  
305.667.1651, ext. 3322

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# Introduction

*This unit has been prepared to help you and your students learn about plants and the different ways we need them to survive. It is intended to optimize the learning experience during your field study at Fairchild Tropical Botanic Garden. This multi-disciplinary unit features activities in science, math and language arts, and contains many ready-to-use worksheets for students. These activities were designed for students in **kindergarten through second grade**, and are aligned to Florida's Next Generation Sunshine State Standards for these grade levels.*

## **Living with Plants:**

Let's use our imaginations and pretend we live in a world without plants. Imagine a world without the grass we love to run through, the trees we love to sit under, or the flowers we love to touch and smell. Imagine a world without some of our favorite things to eat like strawberries, french fries, chocolate, or peanut butter sandwiches. Imagine a world without any lemonade or orange juice to drink when we're thirsty. Imagine a world without the T-shirts and socks we wear everyday. Imagine a world without chairs to sit on, beds to sleep in, books to read, or pencils and paper for writing. Now imagine a world without the medicine we need to make us feel better or the oxygen we need to breathe!

It's hard to believe, but without plants, there wouldn't be any you or me. Humans depend on plants for many things, and humans aren't the only living creatures that need plants in order to survive. Birds, insects, mammals, fish and everything else that lives on planet Earth all depend upon plants for their survival. Plants, humans, animals and all other living things are connected to each other like a web, and what happens to one group affects all the others. That's why it is so important for people to learn all about plants and how to take care of them. The people at Fairchild Tropical Botanic Garden, and other botanical gardens like it, are busy working to protect and care for plants because they are such an important part of our environment.

# Words for a Day at Fairchild

**Botany** - the scientific study of plants.

**Botanical garden** - a place where plants are protected, studied and displayed.

**Ecosystem** - a community of plants and animals that live together and depend upon each other for survival.

**Environment** - the surroundings which affect the life of an organism.

**Flower** - the blossom of a plant, whose purpose is to attract a pollinator.

**Fruit** - the plant part that develops from a flower and contains seeds.

**Habitat** - the area where a plant or animal is naturally found.

**Interdependence** - having to rely or depend upon other organisms for survival.

**Leaf** - the plant part that absorbs sunlight and produces sugar ("plant food").

**Oxygen** - part of the air we breathe; plants release oxygen during photosynthesis.

**Photosynthesis** - process by which plants make their food using sunlight, water, and air.

**Plant** - a living multi-celled organism that produces its own food through photosynthesis.

**Root** - the plant part that holds the plant in place and takes in water and nutrients from the soil.

**Seed** - the first stage in a plant's life cycle; from a seed, the plant will germinate and mature.

**Stem/Trunk** - the plant part that carries water and nutrients throughout the plant.



Trunk of a rainbow eucalyptus  
(*Eucalyptus deglupta*)

# Pre-visit Activity:

## P.L.A.N.T.S. Needs

### Objective

Students will list basic plant needs and demonstrate the importance of space when planting seeds and transplants.

**Next Generation Sunshine State Benchmarks:** SC.K.L.14.3, SC.1.N.1.1, SC.1.E.5.4, SC.1.L.17.1, LA.K.1.6.1, LA.K.1.6.3, LA.K.1.6.5, LA.K.5.2.1, LA.1.1.6.1, LA.1.1.6.5, LA.1.5.2.1, LA.1.5.2.2, SS.K.A.3.1, SS.1.A.3.1, MA.K.G.2.1, MA.K.G.3.1, MA.1.G.5.2, PE.K.R.2.2, PE.1.R.1.3

### Vocabulary

oxygen	habitat
carbon dioxide	nutrients

### Materials

Poster board or white board  
Outdoor area (optional)

### Procedure

1. Ask the students what people need to live. List the five basic needs that all people share: food, water, air, shelter and clothing on the board.
2. Ask a student to circle the items that plants must have to live. Ask if they know of anything plants need that people do not.
3. On the left side of the board, write the word PLANTS vertically, and tell the students that the clues to everything a plant needs are in that word.
4. Once the list is complete, it will read: P-place; L-light, A-air; N-nutrients; T-thirst; S-soil. Challenge the students to recall the list of plant needs without looking at the board.
5. Have the students tell you what they like about their houses. Ask them what makes a home a comfortable place to live. With the word PLANTS still on the board, ask the students what kind of home a plant would want to live in, the plant's habitat.
6. Take the students outside and stand in the shade of a tree or building. Ask them if they think this would be a good spot for the plant to grow. If possible, take them to a place near a ditch or where water stands or an area with little soil and ask them what they think about the location. Walk to a sunny area and also ask if their plant would like to grow there.

7. Begin to introduce the concept of space and tell the students that plants must have enough space to ensure that they are getting everything they need. If plants are planted too close, they might not all get enough light, water or nutrients.
8. This activity is best when done outside, but will work inside as well. Ask four students to be wildflowers in the garden. Have them sit on the ground next to one another in a square and stretch out their arms and fingers as if they are growing up to the sun.
9. Ask six additional students to be tall sunflowers and stand closely around the wildflower plants so they are crowded. Have the sunflowers stretch their arms up and grow, too. The wildflowers should be feeling crowded at this point.
10. Ask the wildflowers if they feel they are getting enough light. Roots from the sunflowers will probably grow all around the wildflowers, soaking up water.
11. Ask the rest of the class to suggest ways to rearrange the sunflowers and wildflowers so that they have enough space to grow, but not so much space that weeds take over in between.
12. Explain to the students that when planting a garden, it is important to know how big a plant is going to be when it matures. Also explain how plants have adapted different ways of arranging themselves in the wild and growing in the right place where they will receive all of the things that they need to grow.

### Extension-Establish Your Own School Garden!

If you don't already have a school garden, this is a great time to create one! A school garden may start out small but can be expanded each school year. There are many different types of gardens, vegetable gardens, butterfly gardens, or even salsa and pizza gardens. You might want to start with a container garden in your classroom. Plants such as beans, peanuts, and some herbs can be grown easily indoors, and may be used for other lessons and science experiments. For more information and resources visit [www.fairchildgarden.org/education](http://www.fairchildgarden.org/education) or [www.kidsgardening.org](http://www.kidsgardening.org). Happy Gardening!

*Adapted from Wildlife Gardener, A Junior Master Gardener Golden Ray Series*



# Pre-visit Activity: Plant Parts

## Objective

Students will identify the basic parts of a plant and their functions.

**Next Generation Sunshine State Benchmarks:** SC.K.N.1.4, SC.1.L.14.2, SC.2.L.17.2, LA.K.1.1.1, LA.K.1.6.1, LA.K.1.6.3, LA.K.1.6.6, LA.K.5.2.1, LA.1.1.6.1, LA.1.1.6.5, LA.1.5.2.1, LA.2.1.6.1, LA.2.1.6.5

## Vocabulary

leaf	fruit
stem/trunk	seed
flower	seedling

## Materials

“The Parts of a Tree” handout (page 8)

Flowering plant (in the garden, a potted plant or pictures with a flower)

Crayons/markers

## Procedure

1. This activity works best outside. Gather the students around a plant in the schoolyard. You may also take a potted plant inside the classroom, or print various pictures of plants that students can look at.
2. Ask the students to begin identifying the different parts of the plant.
3. Complete the “Parts of a Tree” handout.
4. Have each student draw a plant with a stem, leaves, roots, flowers, and fruit. Label each part on the drawing. This could be an imaginary plant, or their favorite plant from home or school.
5. Draw a tree on the board. Cover up a part of the plant, such as the leaves. Ask the students if the plant could survive if it did not have this part. For example, the tree could not make its own food without the leaves. Without flowers, the tree may survive, but could not make seeds to produce any offspring.

# Living with Plants

## Parts of a Tree: Papaya Tree

Color the drawing of the Papaya Tree, and then draw an arrow from each box to the correct part of the tree.

Leaf

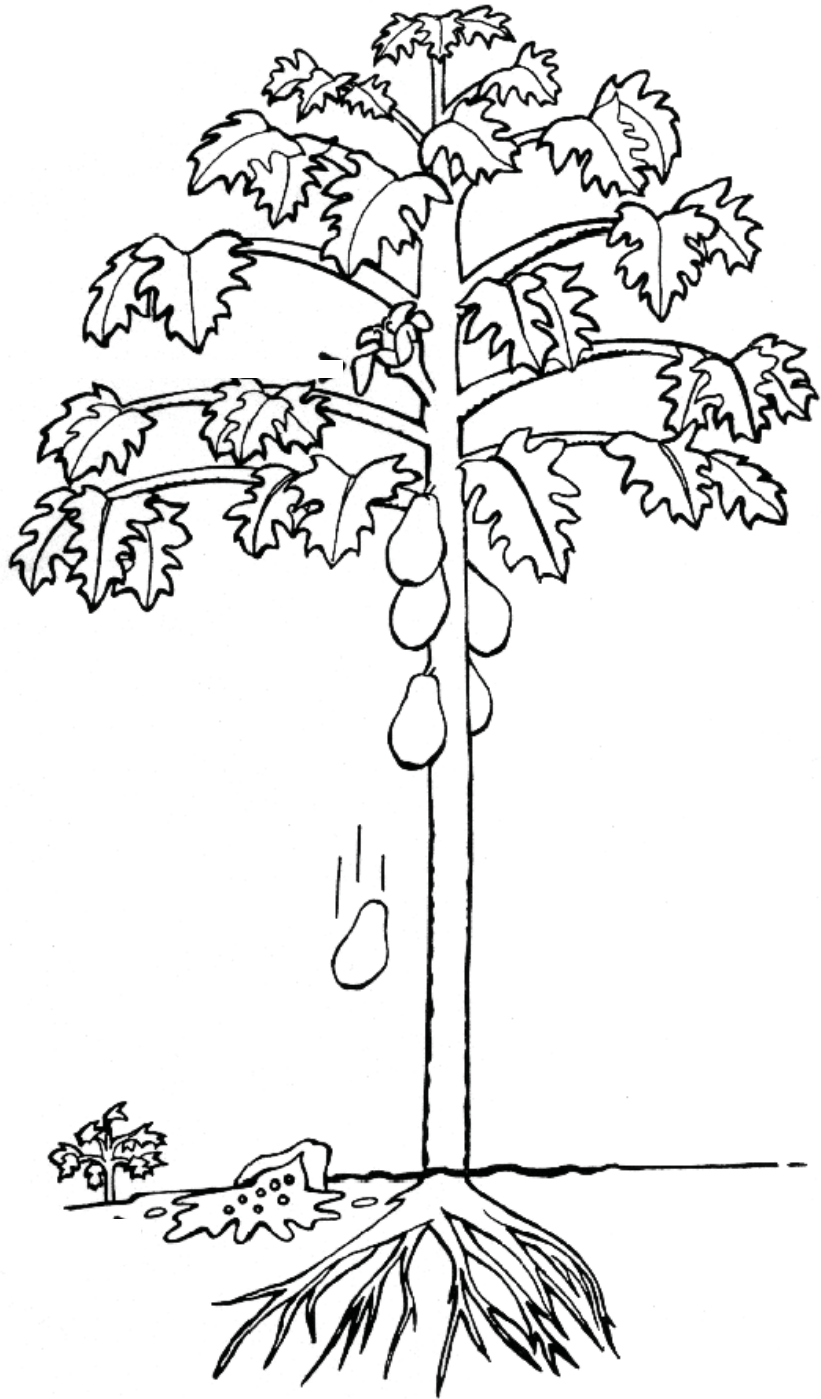
Fruit

Flower

Seed

Trunk

Seedling



# Pre-visit Activity:

## Things We Get From Plants

### Objective

Students will recognize our dependence on plants and plant products. Students will understand that people use plants to produce items such as food, medicine, shelter, and clothing.

**Next Generation Sunshine State Benchmarks:** SC.1.L.14.3, SC.2.P.9.1, SC.2.L.17.1, SC.2.L.17.2, LA.K.1.6.1, LA.K.1.6.4, LA.K.5.2.1, LA.1.1.6.1, LA.1.1.6.6, LA.1.5.2.1, LA.2.1.6.1, LA.2.1.6.5

### Vocabulary

oxygen	clothes
medicine	food

### Materials

“From a Plant/Not From a Plant” handouts (pages 10 &11)

Scissors

Glue

Crayons/markers

### Procedure

1. Ask the students if they think they could live without plants.
2. Have the students to identify some of the things they enjoy that come from plants. For example, students may list plants they ate for breakfast or lunch.
3. Discuss how our basic needs for oxygen, food, and shelter are fulfilled by plants. Plants also provide us with medicines, clothing, and many other things like musical instruments, books and perfume.
4. Complete the “From a Plant/Not From a Plant” handout by pasting each object in the appropriate column.

### Extension-I Spy

Have the students look around the classroom to try to identify more objects that are made from plants. These may include wooden desks, cork boards, pencils and rubber bands.

Name \_\_\_\_\_

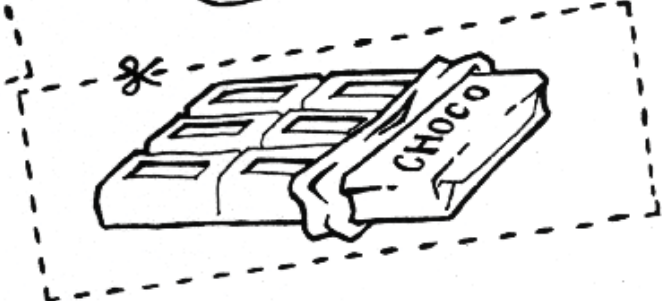
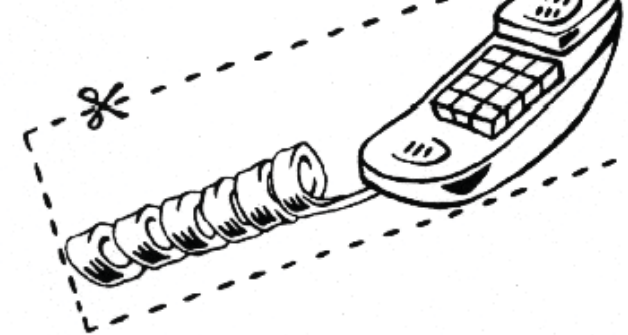
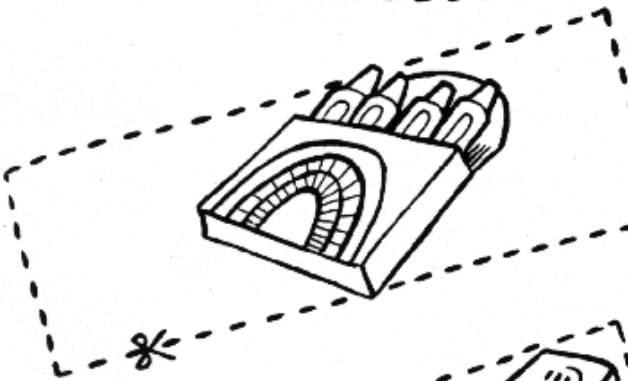
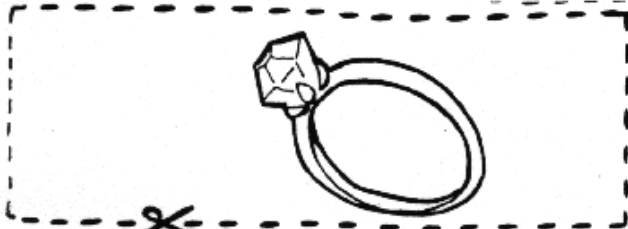
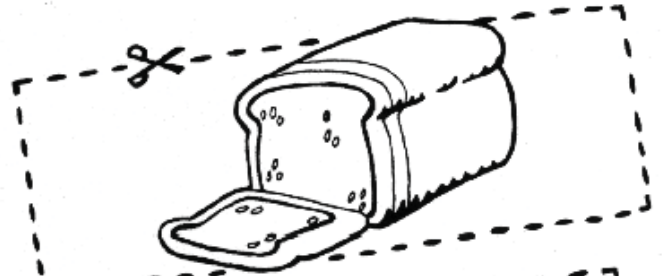
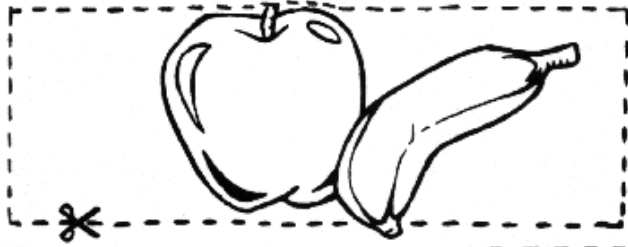
Date \_\_\_\_\_

# Living with Plants

## From a Plant/Not From a Plant

From a Plant	Not From a Plant





# Post-visit Activity: Flower Friends

## Objective

Students will learn that flowers come in a variety of colors. Students will match these different colors to the animals that are attracted to them.

**Next Generation Sunshine State Benchmarks:** SC.K.P.8.1, SC.K.L.14.3, SC.1.L.14.3, SC.2.N.1.1, SC.2.L.16.1, SC.2.L.17.2, LA.K.1.6.1, LA.K.1.6.3, LA.K.1.6.6, LA.1.1.6.1, LA.1.5.2.2

## Vocabulary

flower      pollinator

## Materials

Pictures of pollinators (butterflies, moths, birds, bees, beetles, flies, bats, ants)  
Assortment of flowers in a variety of colors (dried, silk or live plants)  
Poster board or white board

## Procedure

1. Animals have favorite colors just like your students do! Butterflies are attracted to red, orange, yellow, blue and pink flowers. Moths fly at night and visit light colored flowers. Hummingbirds are drawn to red, orange and magenta colored flowers. Bees typically visit yellow, blue and purple flowers. You can find more information on pollinator preferences online.
2. Ask the students to name their favorite colors and record their responses on the board. Review the different plant parts students observed during the field study. Ask which part of the plant is the most colorful. Accept different answers until the students mention flowers.
3. Ask the students to name different animals that visit flowers. Write their responses on the board. Ask the students to think about why animals visit flowers. Flowers put a lot of energy into producing scents and colorful petals to attract pollinators. Revisit the class list of favorite colors, and see which students share favorites with pollinators.
4. Pass out pictures of pollinators and have the students match their animal to the appropriate flower.

## Extension-Garden Guides

Having the students apply their new knowledge to the plants around the school is a great way to add a little playfulness to the garden. Laminate the pollinator pictures and tape them to a paint stick (which most hardware stores will donate). Challenge your students to find a plant their pollinator would visit and put the stick in the ground next to the plant.

# Post-visit Activity: What's in the Soil?

## Objective

Students examine a sample of soil and sort the various components to discover the variety of items that make up soil. Students will also classify ingredients into two major categories: plant and mineral.

**Next Generation Sunshine State Benchmarks:** SC.K.N.1.2, SC.K.N.1.5, SC.1.N.1.2, SC.1.N.1.3, SC.1.E.5.3, SC.1.E.6.1, SC.1.P.8.1, SC.1.L.14.2, SC.2.N.1.1, SC.2.N.1.2, SC.2.E.6.1, SC.2.E.6.2, SC.2.E.6.3, SC.2.L.17.2, LA.1.1.6.1, LA.1.5.2.1, LA.2.1.6.1, LA.2.5.2.1

## Materials

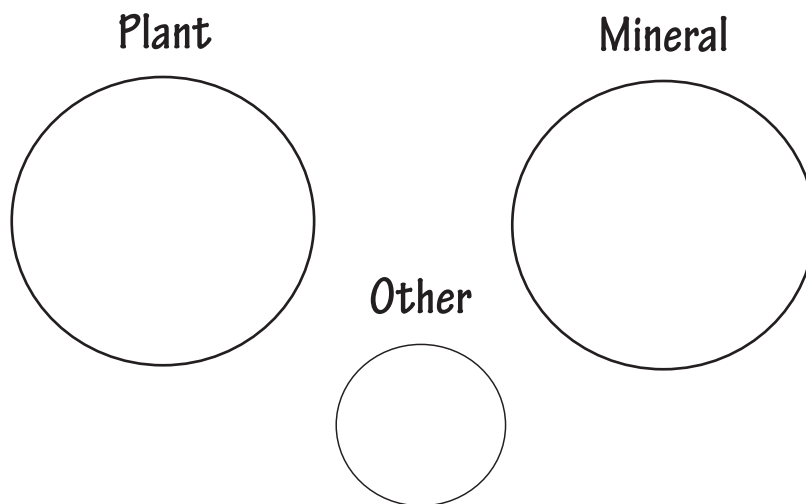
Flat toothpicks	Poster board
11"x17" paper	Plastic spoons
Magnifiers	Bug box
Journal or notebook	Pencils/crayons/markers
4 soil samples (about 3 cups each)	



## Procedure

1. Before class begins, collect soil samples from several areas that haven't been watered recently. Dry garden soil is easier to sort.
2. Make a chart entitled "What's in the Soil?" on the board. (See list above for some examples). On another board, make a line dividing the space in half vertically. Title the left side of the chart "Plant" and "Mineral" on the right side.
3. Ask the class why they think soil is important, i.e., plants grow in it, we walk on it, animals live in it, etc. Point out that soil is a mixture of many different things, some of which traveled many miles before ending up in the schoolyard.
4. Ask the students to predict items they might find in a spoonful of soil and list these on the "What's in the Soil?" chart. This list will give everyone ideas about the things they might find in their own samples.
5. Explain that scientists and farmers talk about the soil because the quality of the soil's ingredients determines the quality of the plants that grow in it. Review the needs of plants with the students, emphasizing water and nutrients, both of which are held in the soil. An even mixture of plant and mineral debris is best.
6. Define the term "plant" as items that came from plants such as roots, leaves, sticks, seeds, and bark. "Minerals" constitute rocks, sand, pebbles, crystals and clay, all of which are important for plant growth.

- their items into the two major categories: plant and mineral. Each group will receive an 11X17" paper and will draw two big circles (see example below). Label one "plant" and the other "mineral". Show the students that they will use their toothpicks to drag an item, such as a leaf over to the plant circle, or a pebble to the mineral circle. If there is an item doesn't fall into those categories (e.g., a dead animal, trash), tell the students to draw a third circle and label it "other".
8. Distribute the equipment and direct everyone to collect their soil samples and place a spoonful of soil between the two circles. Distribute one magnifier to each group. As you circulate among the class, ask students why they sorted particular items in the "plant" or "mineral" category.
  9. If students find any critters, point out that most soil organisms are good and harmless. Encourage children to gently collect their critters in a "bug box" to share with the group, and to release in the garden at a later time.
  10. Ask how their soil samples compare with the class's predictions. Did they find examples of each thing listed under "What's in the Soil?" What new kinds of items did they find? Were there items that didn't fit in either the "plant" or "mineral" category (toys, trash)?



### Analyzing the Data

1. Ask a group to share the items they found and how they classified it: plant or mineral. Write it in the appropriate column. Now ask for a show of hands of those students who also found this material in their sample. Record this number next to the item.
2. Once the entire class has reported their results, discuss the following findings:
  - \* What soil item was reported most often? What item was reported least often?
  - \* Which category had the most items?
  - \* What type of soil would be better for growing plants? Why?
3. Ask students to create a two-part name for their soil, using a plant and a mineral characteristic (leafy-sand or twiggy-clay).

### Extension-Soil Explorations

Students may record the name of their soil in their journals, and describe something interesting that they learned about soil. Students can draw pictures of the soil and imagine what plants would grow well there.

# Suggested Reading

## For Students

**Are Trees Alive?**

Debbie S. Miller

**A Seed is Sleepy**

Dianna Hutts Aston

**Brother Eagle, Sister Sky**

Susan Jeffers

**Miss Rumphius**

Barbara Cooney

**Plantzilla**

Jerdine Nolen

**In the Trees, Honeybees**

Lori Mortensen

**The Lorax**

Dr. Seuss

**Monarch and Milkweed**

Helen Frost

**Tops and Bottoms**

Janet Stevens

**Weslandia**

Paul Fleischman

## For Teachers

**Growing Food**

Pamela Koch, et al.

**Ecology for Every Kid**

Janice VanCleave

**Edible Schoolyard**

Alice Waters

**Hands-On Nature**

Jenepher Lingelbach

**Wildlife Gardener**

Junior Master Gardener Series

**Math in the Garden**

Jennifer White, et. al

**Roots Shoots Buckets & Boots**

Sharon Lovejoy

**The Growing Classroom**

Roberta Jaffe

