

Lesson 2: Plants (2 Days)

Getting Started

✿ Questions to Explore

- How are plants dependent on their environment?
- How are the parts of a plant interconnected?



Facts and Definitions

- A flowering plant has flowers, and a nonflowering plant has no flowers.
- A **woody plant** survives from one year to the next and has a stem that contains wood.
- An **herbaceous plant** has leaves and stems that die at the end of the growing season.

⦿ Skills

- Observe and measure how the quantities and qualities of nutrients, light, and water in the environment affect plant growth. (S)
- Observe and describe how environmental conditions determine how plants survive and grow in a particular environment. (S)
- Conduct science experiments and investigations. (S)
- Follow the scientific method. (S)
- Analyze and interpret information to construct reasonable explanations from direct and indirect evidence. (S)
- Communicate valid conclusions. (S)

✂ Materials

- | | |
|---|---|
| • 4 small potted plants | • markers* (Activity 6 - Option 2) |
| • cardstock* (Activity 6 - Option 1) | • measuring cup |
| • colored pencils or markers | • metal hanger* (Activity 1 - Option 2) |
| • colored pencils or markers* (Activity 3 - Option 2) | • paintbrush (kit) |
| • cup | • plastic wrap |
| • glue | • ruler (kit) |
| • hole punch* (Activity 1 - Option 2) | • science journal |
| • index cards (kit)* (Activity 1 - Option 2) | • scissors* (Activity 6 - Option 1) |
| • jar or glass | • small knife |
| • large sheet of paper* (Activity 6 - Option 2) | • small potted plant |
| • lima beans (kit) | • variety of flowers* (Activity 6 - Option 1) |
| | • yarn (kit)* (Activity 1 - Option 2) |

Introduction

Tell your child that today she is going to begin her in-depth study of plants. Explain that plants can fall into two categories: herbaceous plants and woody plants. **Herbaceous plants** have stems and leaves. They die and go back into the ground at the end of the growing season. These include vegetable plants, annual flowers (make seeds, grow a flower, and die in one year), and perennial flowers (grow back year after

year). **Woody plants** have wooden stems and survive from one year to the next. Woody plants include trees, lilac bushes, and shrubs.

Encourage your child to go in the yard and identify examples of herbaceous plants and woody plants.

Activities

Activity 1: Parts of a Plant (tiered assignment)

Encourage your child to read the web page posted below from the Missouri Botanical Garden about the parts of a plant. After she has finished reading, select one of the following options for your child to complete.



Plant Parts — Missouri Botanical Garden

www.beyondthepage.com/link/10948/

This page from the Missouri Botanical Garden will introduce your child to the parts of a plant.

Option 1

For this option, your child will draw a flowering plant and label the parts on the sheet, "Parts of a Plant." On the left side of the page, she can write a sentence that describes the function of each part.

Answers: (Answers will not be exact but should have the general idea.)

Stem — supports the plant and carries nutrients from the roots to the rest of the plant.

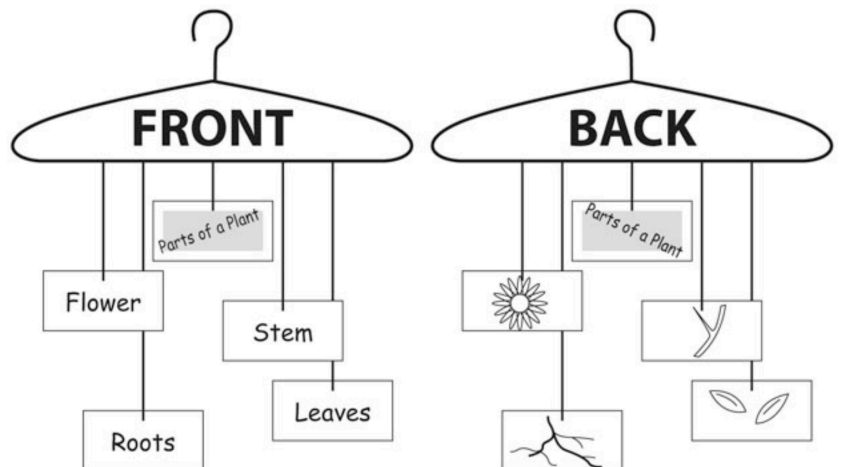
Roots — anchor the plant and absorb nutrients from the soil.

Leaves — where plants make their food.

Flower — where seeds are produced.

Option 2 (Advanced)

For this option, your child will create a mobile of plant parts. Give her five index cards. Tell her to label both sides of the card that will go at the top of the mobile, "Parts of a Plant." The other four cards will have the name of the plant part on one side of the card: stem, roots, leaves, and flower. The opposite side of the card will either have a picture of the plant part or will list the function of each part of the plant.



Note: If your child has a more in-depth understanding of plant parts, encourage her to include additional parts on her mobile.

Activity 2: Absorbing Water

Explain to your child that plants absorb water through their roots and release water through their leaves. In this experiment your child will measure how much water passes through a plant in 24 hours. Help your

child with the following directions.

1. Use a measuring cup to fill a jar or glass with water.
2. Write down how much water you put into the jar.
3. Cover the jar with plastic wrap.
4. Carefully remove a small potted plant from its dirt. Be very careful not to damage the roots.
5. Use a small paint brush to clean as much soil as possible from the roots.
6. Have an adult cut a small slit into the plastic wrap that covers the jar.
7. Push the roots through the slit until they are in the water, and the plant rests on top of the plastic wrap.
8. If the slit opens wider, add more plastic wrap.
9. After 24 hours, remove the plastic wrap and the plant from the jar and measure how much water is left in the jar.
10. Subtract this amount of water from the original amount to see how much water the roots absorbed in one day.

If your child is intrigued by this experiment, encourage her to try this experiment with different types of plants to see which species absorbs the most water.

Activity 3: Types of Plants

For this activity, your child will look at the variety of plants living in different habitats. Explain that different types of plants grow in different types of places, and the design of a plant allows it to survive in its habitat.

Discuss that plants can be grouped into categories: flowering plants and nonflowering plants.

Review the difference between herbaceous and woody plants — woody plants have stems or trunks covered by a layer of bark, and herbaceous plants have stems that are soft and green. An herbaceous plant has stems that die at the end of the growing season.

Select one of the following options.

Option 1

For this option, your child will label the habitats on the page, "Types of Plants" (Option 1), and draw the correct plant in each box. She can label the plants as flowering or nonflowering and herbaceous or woody on the lines beneath the plant. She may need to do some online research to help her reach her decision.

Answer Key:

- Milkweed (prairie) — herbaceous, flowering
- Fir (forest) — woody, nonflowering
- Bromeliad (rainforest) — herbaceous, flowering
- Joshua tree (desert) — woody, flowering

Option 2 (Advanced)

For this option, your child will draw and label the habitats for the four plants shown on the page, "Types of Plants" (Option 2). She can label the plants as flowering or nonflowering and herbaceous or woody on the

lines beneath the plant. She may need to do some online research to learn more about the plants and their habitats. (Refer to the answers for Option 1).

Day 2

Before You Get Started

Reminder - Yesterday your child started an experiment called "Absorbing Water." Finish this experiment before you get started on today's lesson.

Prepare for Tomorrow - Ask your child to take a cup of water and drop in three or four lima beans. Set this aside for tomorrow. Note that the lima beans are in the Lesson 3 section of your kit.

Activity 4: What Do Plants Need?

Ask your child to make a list of what plants need in order to grow. Then ask her why certain plants grow better in certain environments than others. On the Internet or in an encyclopedia, read about cacti and how they survive with so little water.

Explain to your child that there are seven basic requirements that plants need in order to grow properly — the right temperature, light, water, carbon dioxide, nutrients (from the soil), time, and room to grow.

The "What do Plants Need?" page features a picture of a plant in its environment. Ask your child to list the seven things plants need in order to grow. Then ask her to describe on the lines provided how the plant in the picture is receiving the seven things it needs.

Answer Key:

- Light — The plant gets light from the sun.
- Water — The plant gets water from the rain.
- Carbon dioxide — The plant gets carbon dioxide from people and animals (the turtle in the picture).
- Nutrients — The plant receives its nutrients from the soil.
- Time — The plant has time to grow in its habitat.
- Space to grow — The plant is in an open space, so it has room to grow.
- Temperature — The environment is the right temperature for the plant.

Activity 5: Conditions for Growth Experiment

Use 4 small potted plants of the same type for this activity. Let your child label the plants 1-4 and record their starting height. Now let her vary the amount of sunlight and water she gives to each one over eight to ten days. On the page, "Conditions for Growth Experiment," she can list the location of each plant and the amount of water it received every other day.

For example, she may place one plant in a bright window and give it 1/4 cup of water. Then she might place another in a room with a small window and very little light and give the plant 1/3 cup of water. Let her decide on the amount of light and water for each plant and ask her to record the information on her activity sheet. After two weeks, she can compare the growth of the plants in the cups and determine which conditions are optimal for seed growth.

Activity 6: Plant Art Ideas

Encourage your child to select one of the plant art activities.

Option 1: Create Pressed Flower Cards

Let your child gather a variety of flowers and place them in the pages of a large phone book for a couple of days until the flowers are flat and dried. Then she can cut two or three pieces of cardstock paper in half and fold each part to make a card. She can arrange the pressed flowers on the front of the cards and paint over them with glue or decoupage. Let them dry, and she will have beautiful stationery cards.

Option 2: Design a Garden

Give your child a large piece of paper and tell her that she has been asked to be an architectural landscaper. Explain that architectural landscapers design people's gardens. They decide where to put plants and other garden pieces in the garden.

Let your child design the garden on the sheet of paper, labeling the plants and trees that should be placed in the garden. She can also include other gardening accessories such as fountains, ponds, arbors, step-stones, and birdbaths.

Wrapping Up

Ask your child to describe how plants are grouped (flowering/nonflowering, woody/herbaceous). Then ask her to list the seven things plants need in order to grow and survive. Discuss why the right environment is so important for plants. Over the remainder of the unit she should memorize the seven things plants need in order to grow and thrive.

Life Application

Take your child on a nature walk around your neighborhood. Stop to look at some plants and see if she can identify their parts. Which parts are visible and which ones aren't? Have her record her observations in her science journal.

Parts of a Plant

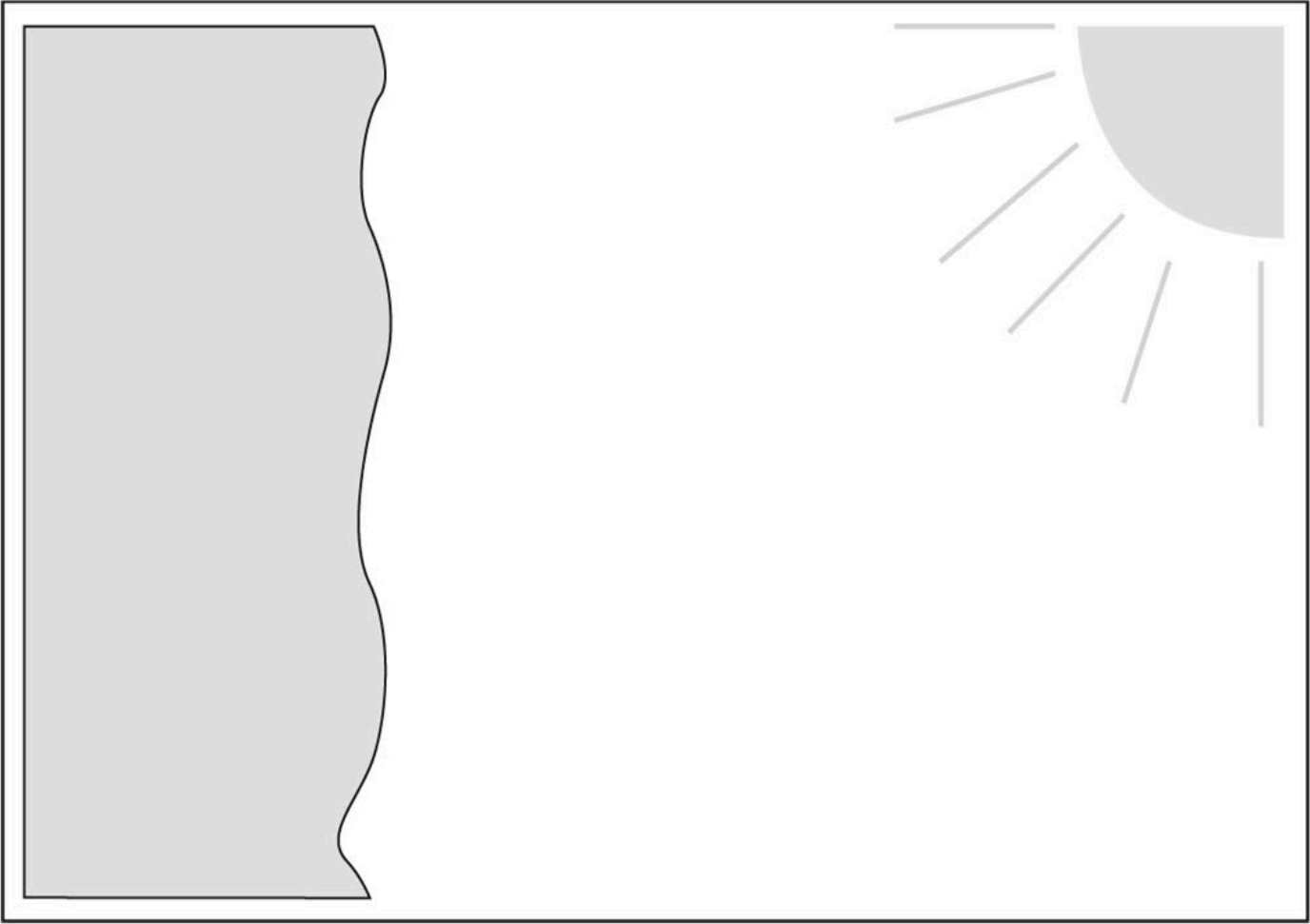
Directions: Draw a flowering plant and label the parts. Then write sentences to describe the function of each part.

1. stem - _____

2. leaves - _____

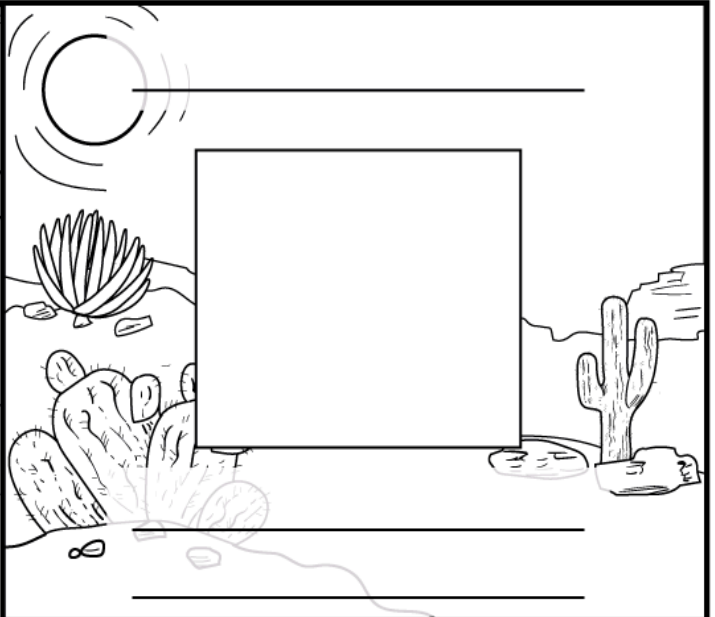
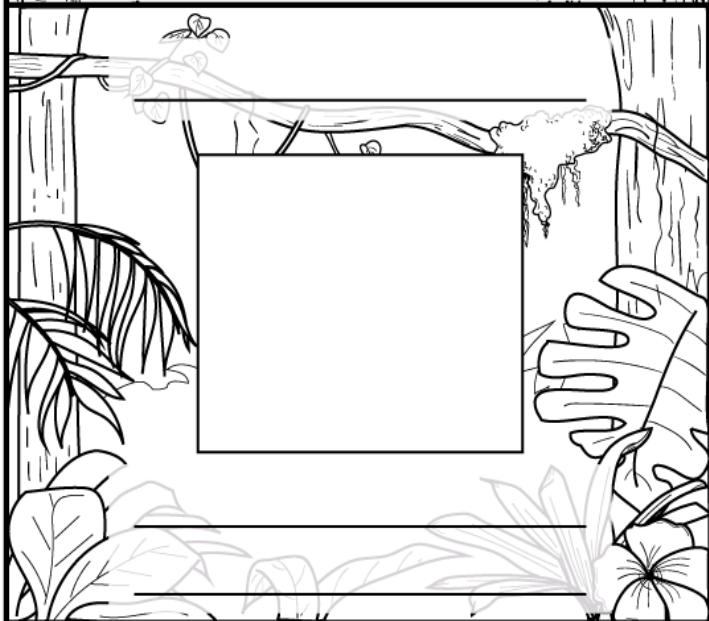
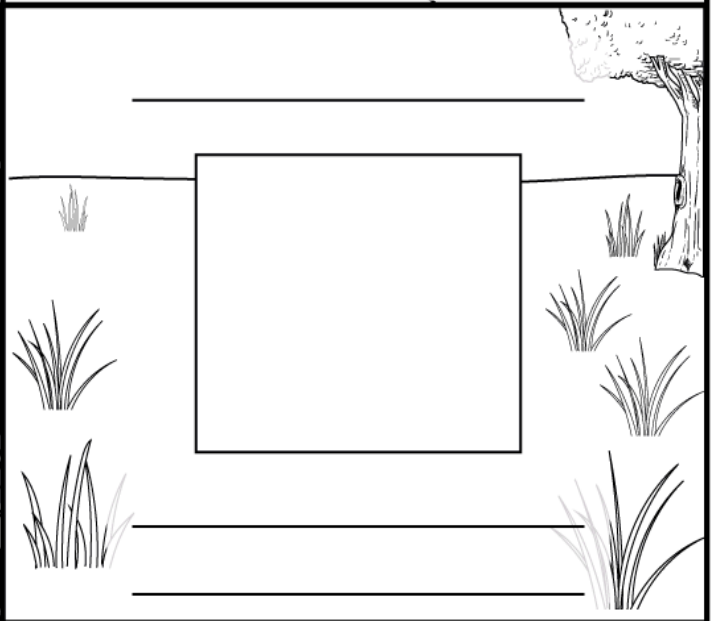
3. flower - _____

4. roots - _____



Types of Plants

Directions: Label the habitats in the pictures on the top line in each box. Then draw the correct plant in each smaller box and label each one as either flowering or non-flowering and herbaceous or woody.



milkweed



joshua tree



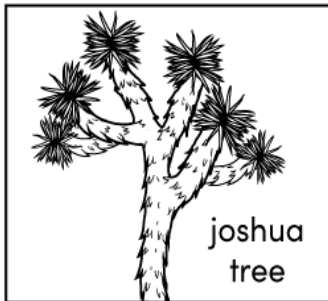
bromeliad



fir tree

Types of Plants

Directions: Draw and label the habitats for each plant below. Decide whether each plant is woody or herbaceous and flowering or non-flowering and label them on the lines provided.



What Do Plants Need?

Directions: List the seven things that plants need in order to grow. Then write a sentence to explain how the plant in the picture is receiving each thing it needs to live and grow.



2.

3

4

۵.

6.

7. _____

Conditions for Growth Experiment

Plant 1

Location: _____
Water Amount: _____
Starting Height: _____

Plant 2

Location: _____
Water Amount: _____
Starting Height: _____

Plant 3

Location: _____
Water Amount: _____
Starting Height: _____

Plant 4

Location: _____
Water Amount: _____
Starting Height: _____

Question: What is the optimal location and amount of water a plant needs to grow?

Hypothesis: _____

Procedure:

1. Gather 4 small potted plants of the same type and label them 1-4.
2. Put each plant in a different location with varying amounts of sunlight.
3. Decide on the amount of water to give each plant, and water each one every other day.
4. After two weeks, measure the plants and see which one grew the most.

Results:

Plant 1: _____

Plant 2: _____

Plant 3: _____

Plant 4: _____

Conclusion:

The best conditions for a plant to grow are: _____