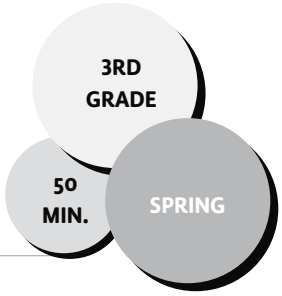
Plant Families

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How can we use observation to help us determine which plants might be related?

LEARNING OBJECTIVES

✓ Students will be able to explain that plant families share certain characteristics.

✓ Students will be able to identify characteristics that a particular plant shares with its family.

CONCEPTS

characteristics observation plant families

ENGAGING THE CLASSROOM TEACHER

- During Action Steps 3 and 4, suggest that the teacher help students work on their worksheet and ensure it's complete before moving on to finding their leaf in the garden.
- During Action Steps 5 and 6, suggest that the teacher help students find their plant families and then work together to identify common characteristics.

LESSON DESCRIPTION

In this lesson, students closely observe a plant leaf to determine its characteristics. Then they hunt in the garden for the plant the leaf belongs to, and then hunt for other classmates who have leaves in their same plant family. In groups, they determine the common characteristics of their plant family and share their findings with the class.

MATERIALS

- ☐ Leaves from various plants in the garden that fall into four distinct plant families
- ☐ Pencils
- ☐ Plant Families Worksheet (pp. 395-396)
- ☐ Magnifying glasses (optional)

PLANT FAMILY EXAMPLES

Brassicaceae: The mustard family	**Solanaceae: The nightshade family**	**Cucurbitaceae: The gourd family**
Kale	Potato	Cucumber
Collards	Tomato	Pumpkin
Cauliflower	Ground cherry	Squash
Broccoli	Tomatillo	Zucchini
Kohlrabi	Peppers	Melon

Asteraceae: The sunflower family	**Amaranthaceae: The amaranth family**
Sunflower	Beets
Zinnia	Lamb's quarter
Calendula	Spinach
Marigold	Quinoa
Dandelion	Chard

PREPARATION

- Photocopy the Plant Families Worksheet for each student.
- Gather leaves from two or more plants from different plant families in your garden. Be sure to know how many plants you have represented from each family, so you can inform students.
- Label the plants you'll be highlighting in the lesson out in your garden (i.e., put a big, visible label saying "Kale" in the kale patch). Do not include the name of the plant family on the label.

ACTION STEPS

1. Engage: Gather students in a circle, and say, *Think of a breed or family of dogs and something they all have in common.* Have students turn and talk to their neighbor and then share examples with the class. Explain, *Dogs inherit physical traits or characteristics from their parents or ancestors, such as their color, or how long their legs are, or even what activities they like to do. They'll have certain things in common with their breed. But then a dog's environment, and how they're trained can make them different from other dogs in their dog family. Can you think of examples?* ***(5 min.)***

2. Relating to Plants: Explain, *Plants we grow to eat are the same! They belong to families too. They share some characteristics with their family. Have students say aloud the word "characteristic."* Continue, *and plants have other characteristics that are unique, that they get from their environment.* If you have them, hold up two different plants from the same plant family, such as a kale leaf and a collard leaf, and ask students to share with a neighbor: *Do you think these two plants are related? Why or why not?* Ask pairs to share what characteristics the plants have in common. Then introduce the next activity: *Today we're going to look at leaves that come from different plant families represented in our garden and work together to determine which plants are related.* ***(5 min.)***

3. Exploring Leaf Characteristics: Pass out a leaf and a Plant Families Worksheet to each student. Walk students through close observation of each characteristic they should look for. Say, for example, *What is the texture of your leaf? Does it feel bumpy, smooth, fuzzy? What does your leaf's edge look and feel like? Is it jagged, round, frilly? What does your leaf look like? Is it spotted, speckled, striped?* Explain that once they've identified their leaf characteristics, they'll hunt for the plant their leaf is from in the garden, but before their hunt they must show you their completed worksheet. Have students work independently to fill out their worksheet, circulating to provide support and giving permission to hunt for their leaves once they've completed Step 1. If you're concerned you don't have enough plants to go around, have students work in pairs or groups of three. ***(5 min.)***

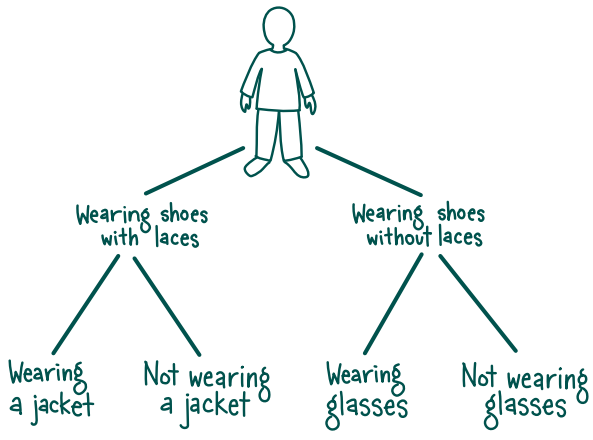
4. Finding Your Plant: Have students hunt in the garden to find the plant their leaf comes from. Have students draw the plant and/or write the name of the plant once they've found it. ***(5 min.)***

5. Finding Your Plant Family: Gather students back together and explain, *Now you're going to find your plant family. You'll go around to different classmates, talking with them and observing each other's leaves until you find*

someone whose leaf you think could be part of your same family. Maybe their leaf is much bigger, but it is also fuzzy and has a jagged edge, for example. Then the two of you will go and find other people in your plant family. Tell students the number of people in each group, so they'll know to stop looking for other members of their family when they've reached five people, for example. ***(5 min.)***

6. What Makes Us a Family?: If students are struggling to find their plant family groups after five minutes, step in and assist them. Once students are in their groups, have them fill out Step 3 of their worksheet, determining what characteristics they all share. Circulate among the different groups, making sure they are discussing common characteristics. Guide students with open-ended questions such as, *How would you describe the shape of your group's leaves?* ***(15 min.)***

7. Whole-Class Sharing: Come back together as a class, and have each group go around the circle and share the characteristics they determined their plant family had in common. Have groups also share a couple examples of plants they determined were in that plant family. Tell students the name of their plant family if they don't know it already. ***(5 min.)***



REFLECTION

Have students discuss the following questions in small groups, then share with the class: ***(5 min.)***

Social and emotional learning

- *How well did your group work together?*
- *Ask yourself: Was I safe and respectful in the garden today?*

Check for understanding

- *How do the characteristics of your plant family help it survive?*
- *How were you able to find your plant family?*
- *How do you think the garden environment changed your plant?*

ADAPTATIONS

People Key: You can introduce the concept of a dichotomous key by dividing your students into two groups based on an observable characteristic, such as "wearing shoes with laces" and "wearing shoes without laces" or zippers versus buttons. Focus on using articles of clothing, rather than on physical characteristics. Don't tell the class the characteristic you're using. Let them observe and guess. Then further subdivide each group, for example, by "wearing a jacket" and "not wearing a jacket." Diagram these groups on the board and continue on. This activity is described in more detail in Shelburne Farms' *Project Seasons* by Deborah Parrella.

Extension: Test each group's knowledge of their plant families' characteristics by giving each group a bowl of a jumble of leaves from garden plants. They then must sort their plant family from the rest of the garden leaves.

Tasting Extension: Focus on one plant family, and taste several different foods from that family, discussing how the flavors and textures are similar and different.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

NGSS LS3.A: Inheritance of Traits

Many characteristics of organisms are inherited from their parents. (3-LS3-1)

Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

NGSS LS3.B: Variation of Traits

Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

Name: _____ Date: _____

Plant Families Worksheet

Step 1: Observe your leaf.

My leaf looks like this:

My leaf is unique because

_____

Step 2: Find your plant.

My leaf comes from this plant:

Step 3: Find your plant family.

We are a plant family because we all have these characteristics:

_____

_____

_____

Name or draw the plant in your plant family: