

# FLOWER DISSECTION INVESTIGATION

**Lesson time:** see additional time. **Vocabulary:** dissect, petal, sepal, stamen, anther, filament, pollen, pistil, stigma, style, ovary, ovule

## Description

In this classroom lesson, students review the life cycle of a plant, focusing on the flower, then dissect and learn the names and purposes of the parts of a flower.

## Guiding Question

Where do plants come from?

## Big Idea

Living and non-living things vary in their characteristics and properties.

## Learning Objectives

At the end of this lesson, students will be able to name the major parts of a flower and state how the flower fits into the life cycle of a plant.

## Materials

A variety of large flowers that contain both male and female parts, such as roses or day lilies, at least one flower per student, plus a few for display. Avoid flowers that do not have all parts, such as squash blossoms. (If the school garden does not have enough flowers, you may be able to find a florist willing to donate old, browning flowers.)

Optional: Examples of other flowers.

Hand lenses or magnifying glasses.

Clear tape

Illustration 3F4a. Enough for each student to have a copy.

Colored pencils, crayons, or other drawing and writing tools.

Illustration 3F4b. One copy, enlarged or projected to share with the class.

## Preparation

Gather flowers and assemble other materials.

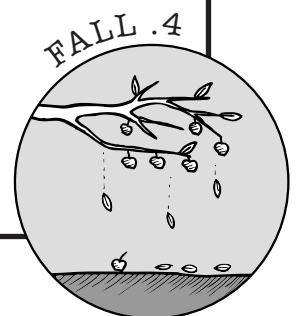
Copy or print illustrations.

Optional: Recruit and train volunteers to assist students in examining and identifying parts of a flower.

**Additional time:** About 2 hours. Lesson can be divided into two lessons, one lesson that uses the introduction and steps 1 and 2, and another lesson that uses steps 3, 4 and 5.



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## Introducing the Lesson

*Activate background knowledge.* Review or introduce students to the life cycle of a plant. You can show Illustration 3F4b, to help students visualize key stages: A plant begins with a seed, which eventually grows roots, stem and leaves. When the plant is fully grown, it may make flowers, which in turn, form seeds and/or fruits. Seeds have the potential to start a whole new plant.

*Engage student interest.* Review with students the key concepts from 3rd Grade Fall Lesson 3, *Flowers! Plant Parts We Eat*. Plants have different parts, and we can eat some parts of plants, including several different flowers. Remind students that each part of a plant has a job that helps the plant to grow and reproduce. Tell students that, just as an entire plant has parts, a flower also has parts, and that today they are each going to take apart flowers to learn more about the parts of a flower and what they do.

## Procedure

1. *Introduce dissection.* Tell students that scientists often dissect, or carefully take apart, things from nature, to learn how they work. Today, students will be scientists who dissect flowers.

2. *Form a hypothesis.* Tell or remind students that scientists guide their investigations with a statement about what they think they will learn: a hypothesis. Brainstorm with students to form a hypothesis about what they think they will find when they dissect flowers. You might end up with a hypothesis such as, "Taking apart a flower will let us see the parts of a plant that make seeds."

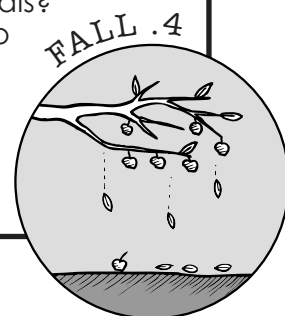
3. *Prepare to dissect.* Hand each student (or pair or group of students, if you do not have enough flowers for individual dissections) a flower and a hand lens or magnifying glass, if you are using them. Hand each student a copy of Illustration 3F4a. Remind students dissecting is taking something apart carefully and slowly. They should follow your instructions to dissect their flowers.

4. *Dissect.* Guide students through dissecting their flowers:

- *Examine the whole flower.* Have students observe their flowers before taking them apart. Encourage students to write notes about the color, texture, shape, smell, and other characteristics of the flower on their copies of Illustration 3F4a. Have them draw a sketch of the flower in the box on the illustration, leaving room to label the parts. Tell students the names of their flowers (such as Day Lilly), and have them write the names of their copies of Illustration 3F4a.
- *Examine sepals.* Have students remove and examine the *sepals* from their flowers. Encourage students to look at the sepals through their lenses, to discuss or make notes about the shape, color, size, smell, feel and other characteristics of the sepals, and to draw the sepals on their copies of Illustration 3F4a. Ask students why they think the flower has sepals? What do they do for the plant? If necessary, guide discussion to help students understand that the sepals are special leaves that guard the flower while it is still a bud.



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- *Examine petals.* Have students remove, examine, draw, label, and discuss the characteristics of the *petals* of their flowers. Ask students why they think the flower has petals? What do they do for the plant? If necessary, guide discussion to help students understand that flower petals attract pollinators to the flower, which helps it to make seeds.
- *Examine stamens.* Have students remove, examine, draw, label, and discuss the characteristics of the stamens from their flowers. Help them to identify and understand the purposes of the two parts of the *stamen*: the stem-like *filament* and the *anther*, at the top of the filament, which holds pollen. (Optional) Have students tap one or more stamens onto the sticky side of a small piece of clear tape to release *pollen*, which should stick to the tape so students can examine it. Have them tape the pollen to their copies of Illustration 3F4a, label it, and write any observations about the pollen next to the tape.
- *Examine pistils.* Have students remove, examine, draw, label, and discuss the characteristics of their flowers' *pistils*. Show them how to carefully take apart the pistil to identify and understand the purposes of four parts of the pistil:
  - The sticky *stigma*, which catches pollen that comes off the anther (You may want to tell students that calling it the "sticky stigma" is a handy way to help them remember the name of this part and what it does.)
  - the tube-like *style*, down which pollen travels to reach the ovary
  - the *ovary*, where seeds are made
  - tiny *ovules* in the ovary, which are "eggs" that will turn into seeds after the pollen reaches them (Students may not be able to see the ovules of their flowers.)

5. *Wrap up.* After students have finished examining the flowers, have them clean up their work areas. Collect the flower and flower parts for composting, gather the hand lenses, and clean tables. Have students write their names on their copies Illustration 3F4a and hand them in to you, either before or after a full-class discussion. During the discussion, revisit the class's hypothesis, comparing it to their observations, and conduct informal assessment of students' learning.

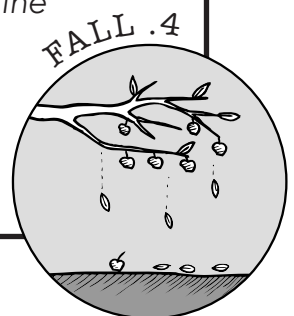
### Assessing Student Knowledge

During full-class discussion, conduct informal assessments of your students' learning by asking them questions such as the following: *What was our hypothesis? What did we find? What was inside your flower? What do the [petals, pistils, stamens, etc.] do for the plant? What is the job of the flower? (Answer: to produce pollen, so that it can produce seeds to grow again.) In which part of the plant is the pollen made? (Answer: Anther) In which part of the plant are the seeds made? (Answer: Ovary) What is the function of the flower petals? (Answer: To attract pollinators) In which part is the pollen caught? (Answer: Stigma) What was your favorite part of the flower? Why? What do you still want to learn about flowers?*

You can also use students' copies of Illustration 3F4a to evaluate students' understanding of the parts of a flower.



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## Extensions

*Flower Part Books.* Instead of composting the parts that students remove from their flowers, you can use them to create flower part books. Supply students with Index cards (approximately five per student, depending on how many plant parts you identify and how many parts students glue on a single page or one on each page); Modge Podge glue; paintbrushes, and markers. As students remove each part during the dissection described above, have them write on an index card the name of the part, along with any notes they want to make about its function. Then, have them use paint brush to smear some glue on the card. Stick the flower part to the glue, and use the paint brush to paint a layer of glue over the part (it will dry clear).

Encourage students to use one card to make a creative cover for their book. Allow all cards to dry completely, then bind each students' cards together by stapling, or punching holes and tying with string, yarn, or ribbon. Students can use the books to help them remember the names and functions of the parts of a flower.

*Garden Flower Search.* Visit the garden to find any flowers still on their plants, and carefully examine them to note the parts students have learned about. (Note that some flowers, such as squash blossoms, only have "male" parts (stamens) or "female" parts (pistils), rather than all parts in a single blossom.)

*Further Study.* Learn more about pollination and flowers, using the books and web site resources listed or by completing 1st Grade Spring Lesson 3, *A Pollinator's View of Flowers* or 1st Grade Spring Lesson 4, *Bees Plus Flowers Equals Pollination*. Adapt those lessons as needed to the level of your students.

*Flower Math.* Add math to this lesson by having students measure and record the sizes of their flower and its parts. Calculate the sum of the flower petals in the entire class, and use division to figure out how many salads could be made with 4 petals each, if the flowers were edible, or create other relevant division and multiplication problems.

## Books & Resources

### Books:

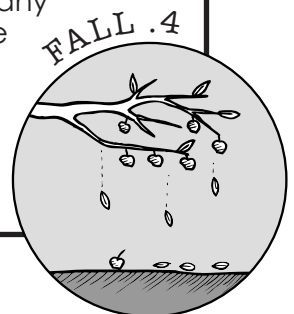
*Flowers and Friends*, by Anita Holmes (Benchmark Books, 2000)  
*How Flowers Grow*, by Emma Helbrough (EDC, 2006)

### Web Sites:

*The Great Plant Escape Case 4: Plantenstein is the Suspect*, <http://urbanext.illinois.edu/gpe/case1/index.html> - Produced by the University of Illinois extension, this kid-friendly introduction to the plant life cycle is framed as a mystery, with plenty of clues for students to solve the "case" of how one plant can create many more just like it. Includes a good discussion with simple drawings of the parts of a flower, as part of the "Facts of the Case," at <http://urbanext.illinois.edu/gpe/case4/c4facts1a.html>.



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Science Clips, [http://www.bbc.co.uk/schools/scienceclips/ages/9\\_10/life\\_cycles.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/9_10/life_cycles.shtml) - The BBC offers a virtual plant dissection, that lets students click and drag to take apart and reassemble a flower, or label a diagram of an intact flower, to learn the names and purposes of the parts of the flower. A very similar version of this activity is available at <http://www.sciencekids.co.nz/gamesactivities/lifecycles.html>.



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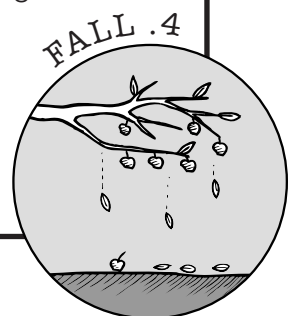
## OR. Dept. of Ed. Key Standards

Oregon State Board of Education Science Content Standards:

- 3.2L.1 Compare and contrast the life cycles of plants and animals.
- 3.3S.1 Plan a simple investigation based on a testable question, match measuring tools to their uses, and collect and record data from a scientific investigation.

Common Core State Standards for English Language Arts & Literacy in History/ Social Studies, Science, and Technical Subjects:

- 3.RI.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
- 3.L.6 Acquire and use accurately, grade-appropriate conversational, general academic, and domain-specific words and phrases, including those that signal spatial and temporal relationships (e.g., *After dinner that night we went looking for them*).
- 3.SL.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.



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Portland Partners for School Food and Garden Education

# Apple

