California Foundation for Agriculture in the Classroom

Flower Hour

Purpose

Students will learn the four main parts of a flower and each part's role in plant reproduction.

Time

Teacher Preparation:
30 minutes

Student Activity:
60 minutes

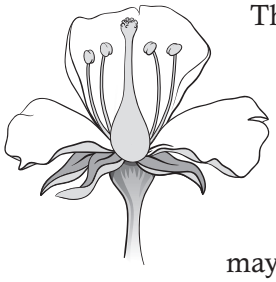
Materials

For each lab group of 3 students:

- *Flower Hour* handout (pages 25-26)
- Composite flower, such as a daisy, dandelion, or sunflower
- Simple flower, such as a tulip, lily, or daffodil. *Florists may have older flowers available at a discount.*
- Hand lens
- Ruler
- Paper towel
- Colored pencils

Background Information

All living organisms depend on plants to provide food, shelter, or oxygen. Therefore, plant reproduction is crucial to all other life on this planet. Different parts of the flower are specialized to help plants reproduce—to produce seeds that are used in new plant growth. Typical flowers have four main parts: pistil (stigma, ovary, and style), stamen (anther and filament), petals, and sepals.



The female part of the flower, the pistil, includes the ovary, style, and stigma. Pollen attaches to the sticky stigma and this begins the process of pollination. The pollen travels down the style until it reaches the ovary where ovules are fertilized and will develop into seeds. Depending on the plant species, a flower may have male, female, or both males and female reproductive structures. Most flowers depend on bees, birds, or insects to help with the pollination process. Smell, color, and nectar attract pollinators to the flower.

The male part of the flower, the stamen, consists of the anther and filament. The anther carries the pollen that fertilizes the female part of the flower and is held up by the thread-like filament.

Petals are the colorful structures that help the flower attract pollinators. Petals also serve as a landing platform for insects and birds. For example, when a bee lands on the lower petal of a snapdragon, its weight causes the stamen to swing down and dust the bee with pollen. Petals of some plant species have stripes or other markings that guide pollinators to the nectar.

The green, outermost petal-like structures of the flower are the sepals. Generally, there are the same number of sepals in a flower as petals. Sepals form the protective layer around a flower in bud.

Flowers come in many shapes and sizes. Not all flowers contain the four flower parts featured in this lesson. Flowers that contain both male and female parts are called complete flowers. Flowers that contain only male or only female parts are called incomplete flowers. Flowers can also be categorized as simple or composite. Simple flowers have only one set of parts, while composite flowers may contain hundreds

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Flower Hour

Content Standards

Grade 2

Science
Life Sciences 2d, 2f
Investigation & Experimentation 4b, 4c, 4f, 4g

Next Generation Science
Interdependent Relationships in Ecosystems 2-LS2.A
Defining and Delimiting Engineering Problems 2-ETS1.A
Developing Possible Solutions 2-ETS1.B

English Language Arts
Writing 8

Mathematics
Measurements & Data 1,4

Grade 3

Science
Life Sciences 3a
Investigation & Experimentation 5c

Next Generation Science
Growth and Development of Organisms 3-LS1.B
Inheritance of Traits 3-LS3.A
Variation of Traits 3-LS3.B

English Language Arts
Writing 8

of tiny individual florets. Common composite flowers are sunflowers, daisies, and dandelions.

Procedure

1. Prior to the lesson, obtain the simple, and composite flowers. The simple flowers should be complete, containing both male and female reproductive parts. Simple flowers, such as tulips, daffodils, and lilies have larger reproductive parts and are easier for students to dissect. Many demonstrations of flower dissection can be found on YouTube. These short videos provide a great way to review flower parts prior to the dissection activity.
2. Have students brainstorm the names of flowers they know. List flowers on the board. Explain that in today's activity students will be dissecting different types of flowers to help them understand how flowers reproduce.
3. Use a large flower, such as a lily, to identify the different flower parts and discuss each part's role in reproduction. Explain that the flower is called a complete flower because it contains both male and female parts.
4. Divide students into groups of three. Give each group a *Flower Hour* handout, hand lens, and simple, complete flower such as a tulip. Instruct students to use the hand lens to investigate the parts of the flower. Students should create a detailed drawing of each part as they record their observations.
5. Begin the dissection. First, demonstrate how to carefully remove the sepals on the calyx. Have students remove the sepals on their flower before they count, sketch, and measure them. Next, have students carefully remove the petals and count, sketch, and measure them.
6. Before having students remove the stamen, caution students that the pollen on the tip of the anther can brush off, making a mess and staining clothes. Instruct students to carefully remove the stamen over the paper towel, count the stamen, and record their observations. Identify pollen-dusted anthers and the thread-like filaments that support the anthers.
7. Only the stem of the flower and the pistil should remain. Explain to students that the pistil is composed of the style, stigma, and ovary. Have students gently remove the pistil and touch the stigma. Record observations. Explain that the stigma is the sticky part of the flower

Flower Hour

Mathematics
Measurements & Data 4

Grade 4

Science
Life Sciences 3c

Next Generation Science
Structure and Function
4-LS1.A

that collects pollen grains. When pollen attaches to the stigma, it travels down the narrow style into the ovary. The ovary has ovules containing egg cells. When an egg cell has contact with a pollen grain, fertilization occurs. Following fertilization, a seed begins to grow. Have students record their observations of the pistil, making special notes about its size, shape, and structure.

8. Once the simple flower is dissected, distribute a composite flower to each group. Instruct students to use the hand lens to examine the flower. As a class, compare and contrast the simple and composite flowers using a Venn diagram.

Extensions

- Identify and discuss flowers that are typically considered vegetables, such as broccoli, cauliflower, and artichokes. Distribute a variety of vegetables, some flowers and some not, and have students use their knowledge about flower parts to determine and justify if the food is, indeed, a flower.
- Students can create their own microscope slides by using index cards and clear packing tape. Cut a small window in the middle of the index card; place a piece of tape over the window. Place the plant part on the sticky side, in the middle of the window. Place another piece of clear tape over the flower part, securing it in place. Instruct students to label their slides and observe each specimen under the microscope.

Variations

- Rather than drawing each plant part, have students tape each plant part to the *Flower Hour* handout.
- Introduce plant reproduction through an educational video on pollination. Check out the video "Pollination" on BrainPOP *(www.brainpop.com)* or search YouTube using the term "Flower Reproduction."

ELL Adaptations

- This lesson incorporates hands-on activities as well as drawing and labeling of flower parts. Kinesthetic learning events provide an excellent learning environment for English language learners.
- Post new vocabulary words and matching illustrations on a word wall.

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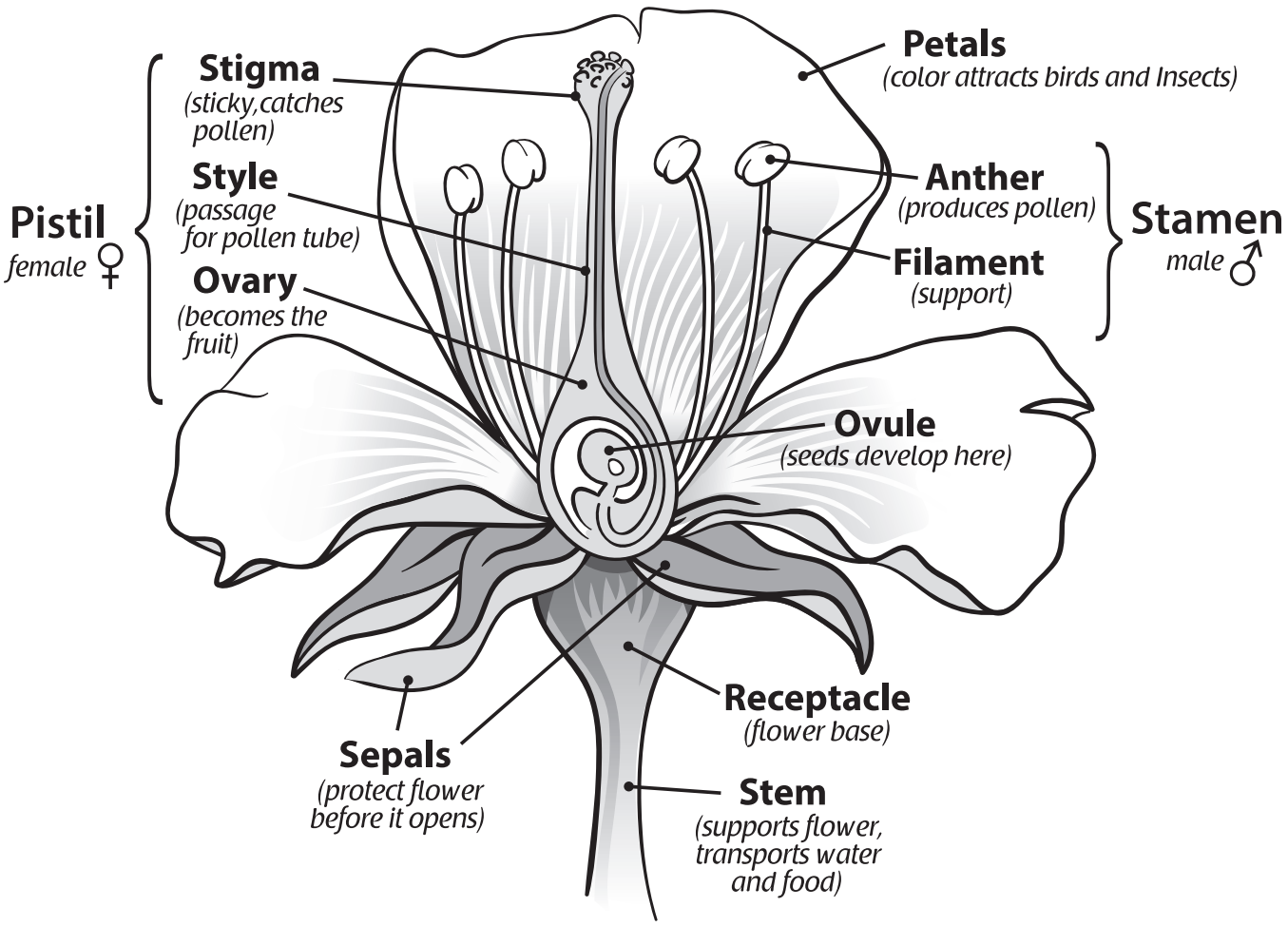
Parts of a Flower



Flower Hour

Name: _____

What are the different parts of the flower and what is their role in reproduction?

Word List

Petal	Anther	Pistil	Stigma
Sepal	Filament	Ovary	Ovule
Stamen	Pollen	Style	Seed

1. Using the hands lens, look closely at your flower. Use colored pencils to sketch your flower.

Top View	**Side View**

2. List four observations you can make about your flower. Think of the size, color, smell, texture, and quantity of each flower part. Use the word list above.

_____

_____

_____

_____

_____

_____

Flower Hour *(continued)*

3. Sketch, count, measure, and identify the function of each flower part.

Flower Part	Sketch	Color	Number	Length (cm)	Function
Sepals					
Petals					
Stamen					
Pistil					
Stem					

4. How do pollinators like bees and birds help fertilize flowers?