FLORIDA Wildflower FOUNDATION

Unit 1

Parts of a Wildflower

Overview

Flowers may look simple, but each part has an important job in helping the plant grow and reproduce. This unit introduces the four main parts of a flower — sepals, petals, pistils and stamens — and explains their roles in reproduction and pollination. This unit helps students identify floral structures, understand how flowers produce seeds, and explore the relationship between flower parts and pollinators. Understanding flower anatomy provides the foundation students need to explore life cycles, pollination and adaptations in later units.

Activities

1. Parts of a Wildflower
2. Operation Dissection
3. Compound Flower Investigation

Vocabulary

anther
calyx
carpel
complete flower
compound flower
corolla
disc floret
filament
floret
flower
incomplete flower
ovary
ovule
petal
pistil
pollen
pollination
pollinator
ray floret
reproduction
seed
sepal
stamen
stem
stigma
style

Vocabulary words are italicized within the introduction text and activities.

Standards

Grade 3: SC.3.L.14.1

Grade 4: SC.4.E.6.5, SC.4.L.16.1, SC.4.L.16.2

FLORIDA Wildflower FOUNDATION

Unit 1

Parts of a Wildflower

Introduction

Most ***flowers*** have four sets of parts, and each one play an important role in the plant's life:

- ***Sepals*** are the outermost parts of the flower. They are small, leaf-like structures that protect the developing flower bud, like a suit of armor. Together, the sepals form a whorl called a ***calyx***. When the flower blooms, the sepals usually remain green and are thicker than the petals.
- ***Petals*** help attract ***pollinators***. Their shape, size and color draw bees, butterflies, birds and other pollinators to the flower's ***nectar***. All of the petals together make up the *corolla*.
- The ***pistil*** is the female part of the flower and is located in the center. It is made up of one or more ***carpels***. Each carpel contains a ***stigma***, ***style*** and ***ovary***. The stigma is sticky and captures ***pollen***. The style is a long tube that connects the stigma to the ovary. The ovary holds the egg-bearing ***ovules***. ***Pollination*** occurs when the pollen lands on the stigma, travels down the style to the ovary and fertilizes the ovules. Once fertilized, the ovules develop into ***seeds***.
- ***Stamens*** are the male parts of the flower. Each stamen has an *anther*, where the pollen is produced, and a ***filament***, which holds up the anther. Stamens can stand alone or sometimes be fused together.

Most plants need both male and female parts in order for ***reproduction*** to occur. Many flowers have both male and female parts on the same plant. Others have separate male and female plants, so female plants may require ***cross-pollination*** from male plants.

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Unit 1 Activity 1

Parts of a Wildflower

Objective

Students will learn the different parts of a ***flower*** and be able to identify them by name and function.

Directions

1. Give each student a "Parts of a Wildfower — Diagram" and "Parts of a Wildflower — Definitions" worksheet.
2. Show "Parts of a Wildflower" visual presentation.
3. Define and discuss each part of the flower (as laid out in the slides) and have students label the flower on the "Diagram" worksheet accordingly.
4. Once the diagram has been completed, have students complete the "Definitions" worksheet, filling in the function of each flower part.

Materials

- "Parts of a Wildflower" worksheet (one per student)
- "Parts of a Wildflower Definition Match" worksheet (one per student)
- "Parts of a Wildflower" visual presentation (click to download)

Standards

Grade 3: SC.3.L.14.1

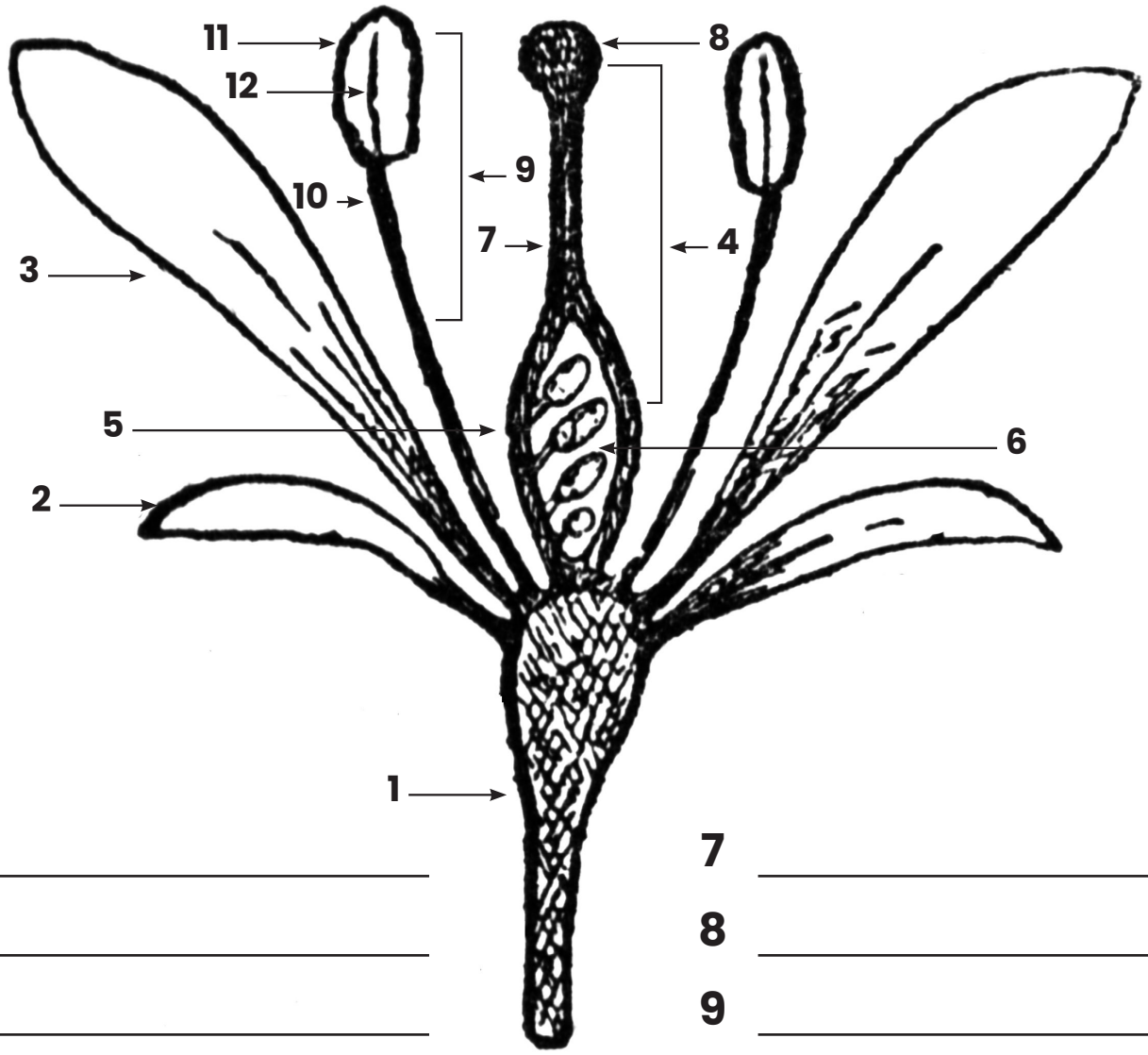
Grade 4: SC.4.L.16.1

Parts of a Wildflower

Use the words in the Word Bank to fill in the blanks with the appropriate plant part.

Word Bank

anther	ovule	pollen	stem
filament	petal/corolla	sepal/calyx	stigma
ovary	pistil/carpel	stamen	style



1 _____ **7** _____

2 _____ **8** _____

3 _____ **9** _____

4 _____ **10** _____

5 _____ **11** _____

6 _____ **12** _____

Parts of a Wildflower

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anther	ovule	pollen	stem
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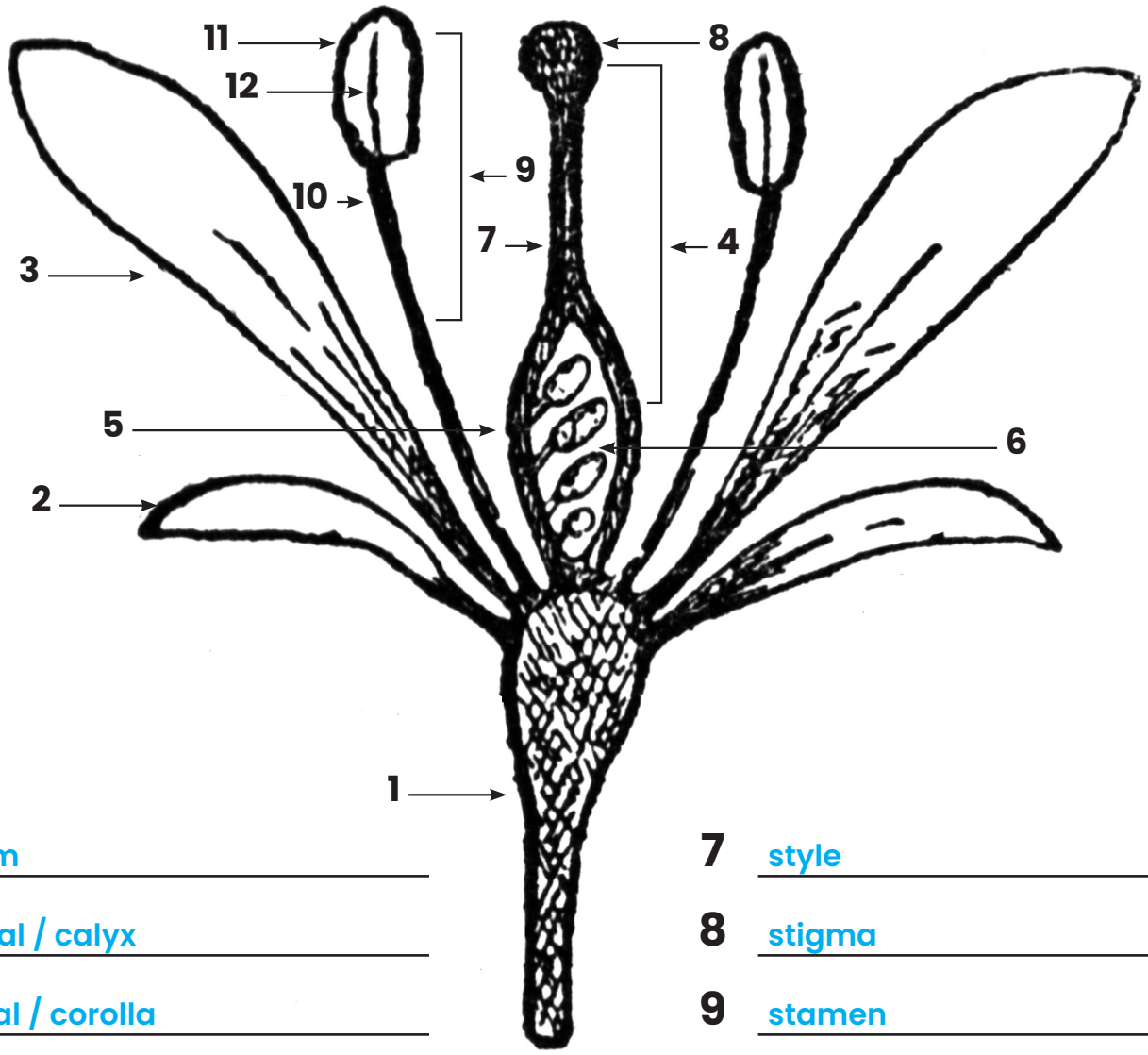

1 stem

2 sepal / calyx

3 petal / corolla

4 pistil / carpel

5 ovary

6 ovule

7 style

8 stigma

9 stamen

10 filament

11 anther

12 pollen

Parts of a Wildflower Definition Match

Match the flower part to its function.

Flower Part	Function
Anther	once fertilized, becomes the seeds
Filament	female part of flower consisting of stigma, style and ovary (also called carpel)
Ovary	sticky, captures pollen
Ovules	produces pollen
Petals	covers the anthers; necessary to fertilize ovules and make seeds
Pistil	supports anther
Pollen	connects stigma to ovary
Sepals	supports flower
Stamen	contains egg-bearing ovules
Stem	attract pollinators (also called corolla)
Stigma	protect flower bud (also called calyx)
Style	male part of flower consisting of anther and filament

Parts of a Wildflower Definition Match

Match the flower part to its function.

Flower Part	Function
Anther	produces pollen
Filament	supports anther
Ovary	contains egg-bearing ovules
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Petals	attract pollinators (also called corolla)
Pistil	female part of flower consisting of stigma, style and ovary (also called carpel)
Pollen	covers the anthers; necessary to fertilize ovules and make seeds
Sepals	protect flower bud (also called calyx)
Stamen	male part of flower consisting of anther and filament
Stem	supports flower
Stigma	sticky, captures pollen
Style	connects stigma to ovary

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Unit 1 Activity 2

Operation Dissection

Objective

Students will be able to identify the variety of ***flower*** parts among wildflower species.

Directions

Students should work in pairs.

1. Give each pair the following:
   - one pair of tweezers
   - one "Parts of a Simple Wildflower" handout (Students may use their completed worksheets from Activity 1 or you may provide them with a copy of the handout on the following page.)
   - one each of the same-variety flowers
   - contrasting-colored construction paper
2. Tell students the flower's common name and have them write it on the paper. (You may also tell them and have them write the scientific name, if known.)
3. Give student pairs the hand lens and tweezers and tell them to remove the ***sepals*** (outer petal-like structures) and tape them to the construction paper and label.
4. Have them do the same with the ***petals***, ***stamens*** and ***pistil***. Before taping the stamens, tell them to shake some of the ***pollen*** grains from the anthers onto the paper and tape them down.
5. Next, give student pairs one or two of the different-variety flowers.
6. Have them follow the same procedure for dissecting, taping and labeling each of the flowers.

Discussion

Have students compare the differences among the flower varieties.

- Do the parts have different shapes?
- Do they have different amounts of parts?
- Are all the flowers complete with sepals, petals, stamens and pistils?

Materials

- "Parts of a Simple Wildflower" handout (one per pair)
- construction paper (one sheet per student)
- hand lens (one per pair)
- Scotch tape
- tweezers (one per pair)
- a single variety of simple wildflowers
- a variety of simple wildflowers

Standards

Grade 3: SC.3.L.14.1

Grade 4: SC.4.E.6.5, SC.4.L.16.1

Tip

These flowers are good choices for this activity:

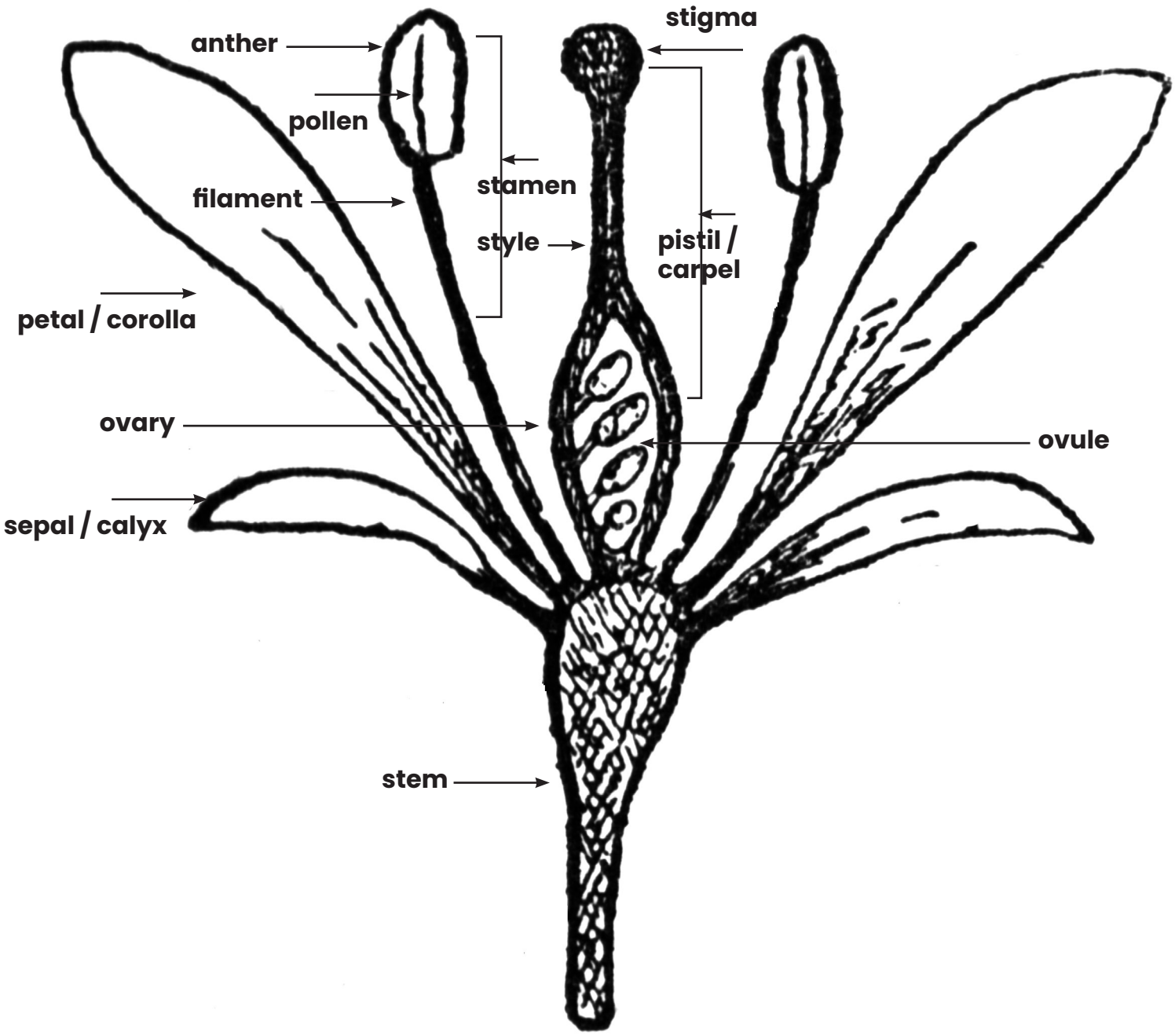
Wildflowers: Hibiscus, Partridgepea, Spiderwort

Store-bought flowers: any with large petals, such as Gladiolas or Lilies

Avoid very small flowers, compound flowers, or flowers with specialized parts.

Note: Teachers should instruct students not to pull apart wildflowers in the wild or at home as they are needed as food for pollinators. Explain that it is permitted here only as part of a guided learning experience.

Parts of a Simple Wildflower



Compound Flower Investigation

Objective

Students will be able to identify the male and female structures in a ***compound flower***.

Discussion

The oldest and simplest ***flowers*** have many ***petals*** of the same shape. As flowers changed during the last 100 million years, newer species eliminated parts or had parts that fused into more complex and specialized structures.

A ***compound*** (or ***composite***) ***flower*** is a flower that is actually made up of many small flowers, although it may look like a single bloom. When trying to identify the male and female structures in compound flowers, such as those in the Asteraceae or daisy family, may initially pose a challenge for both the teacher and students. Most members of the Asteraceae family have a daisy-like flower composed of two different types of flowers. For example, the "black eye" of the Black-eyed Susan is actually composed of many ***disc florets*** surrounded by the outer ***ray florets***.

Directions

Students should work in pairs or groups.

1. Give a copy of the "Compound Flower Investigation" worksheet and one flower to each student pair/group, along with a hand lens to each student.
2. Have them closely examine the flower to see if they can find the ***pistils*** and ***stigmas*** of the inner disc florets and the single petals of the outer ray florets.

Materials

- "Compound Flower Investigation" worksheet (one per pair/group)
- hand lens (one per pair/group)
- flowers with composite heads (one per pair/group)

Standards

Grade 3: SC.3.L.14.1

Grade 4: SC.4.E.6.5, SC.4.L.16.1, SC.4.L.16.2

Tip

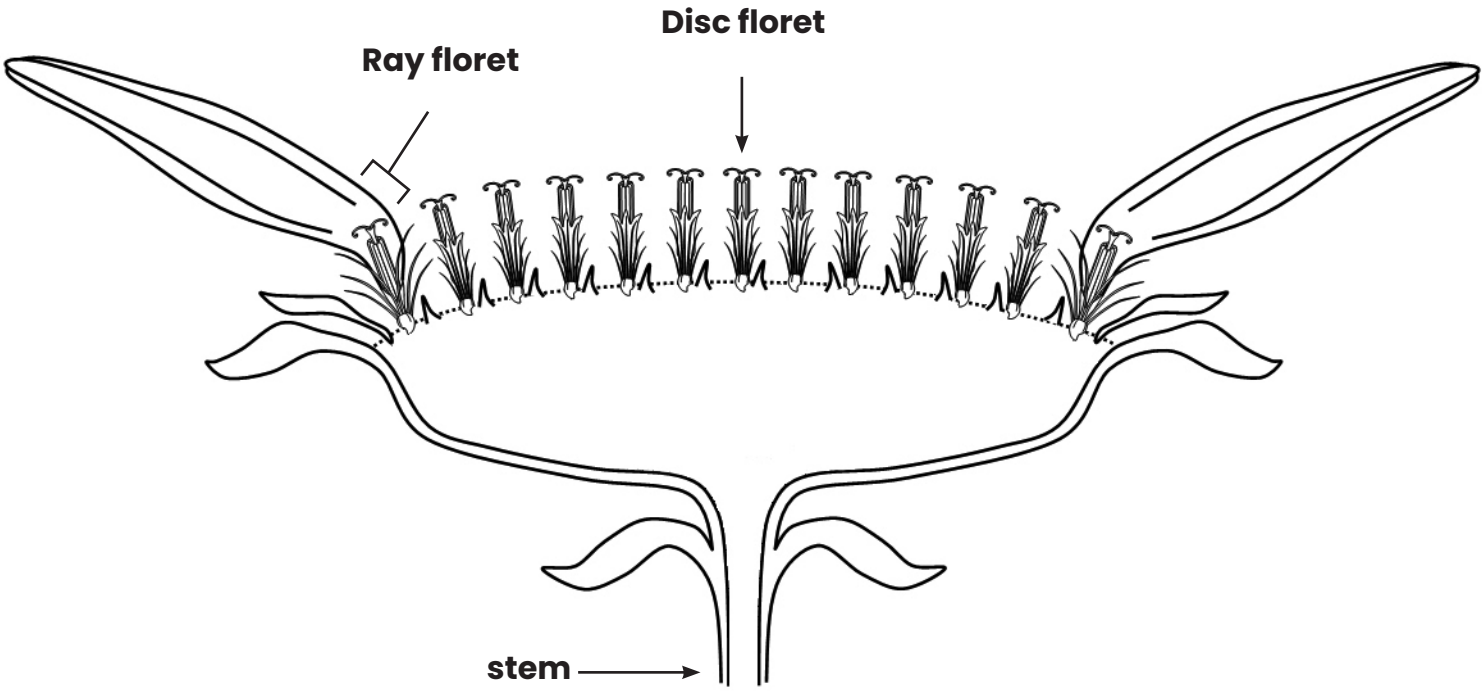
These flowers are good choices for this activity:

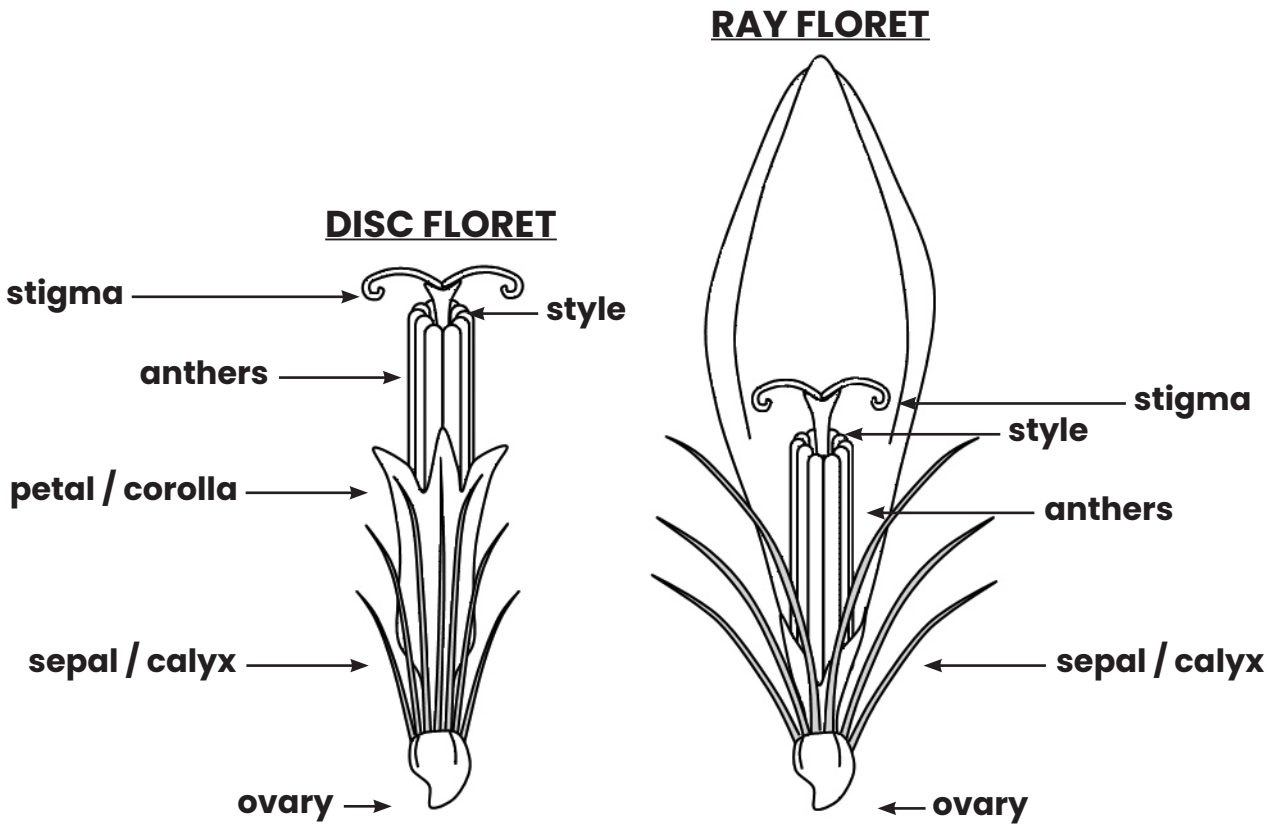
Wildflowers: Black-eyed Susan, Blanketflower, Dune sunflower

Store-bought flowers: Sunflower, Gerber daisy

Note: Some members of the Asteraceae family may be missing one of the flower types. Rayless sunflowers, for example, lack the outer ray florets.

Compound Flower Investigation





FLORIDA Wildflower FOUNDATION

Unit 1

Glossary

anther: yellow, pouch-like part inside of the flower that holds pollen grains, usually located on top of a long stalk that looks like a fine hair

calyx: collective term for the sepals of one flower

carpel: all the female parts of a plant together

complete flower: a flower that has all four main parts: sepals, petals, stamens and pistils

compound (composite) flower: a flower made up of smaller flowers such as those in the Aster family

corolla: collective term for the petals of one flower

disc floret: the small, tubular floret in a compound flower of the Aster family; a group of disc florets forms the disc or central part of the compound flower head and is often surrounded by ray florets

filament: fine hair-like stalk that supports the anther

floret: one of the small flowers making up a composite flower

flower: part of a plant containing petals and sepals, often marked by a distinctive color or fragrance, where fruit or seeds are generated; part of a plant that ordinarily contains the reproductive organs

Note: Flowers can be male, female or bisexual. A male flower has only stamens. A female flower has only pistils. If a flower has both pistils and stamens, it is bisexual or both male and female.

incomplete flower: a flower that is missing one or more of the four main parts

ovary: part of the plant, usually at the base of the flower, that contains ovules and eventually becomes fruit

ovule: part of the ovary in a plant that, after fertilization, becomes the seed

petal: the colorful parts of the flower that often attract pollinators

pistil: organ of a flower that contains the ovule or ovules; female part of the flower made up of four parts — stigma, style, ovary and ovule

pollen: fine, powder-like material that covers the anthers within a flower

Note: This is what bees and other pollinators collect. Pollen is needed by plants to make seeds.

pollination: the movement of pollen from the anther to the stigma, or from the male parts to the female parts of a flower

Note: Pollination occurs when birds, bees, bats, butterflies, moths, beetles, other animals, water or wind carry pollen between flowers, or when it is moved within flowers.

(Continued on following page.)

Tip

Turn the vocabulary words into a Jeopardy-style game for a fun, interactive way to review with your students. Free online templates are available at JeopardyLabs.com, or you can download templates for PowerPoint or Google Slides.

pollinator: an organism (usually an insect, bird or small mammal) that moves pollen from the anther of one plant to the stigma of another

ray floret: the strap-shaped floret in a compound flower of the Aster family.

Note: A group of ray florets form the ray or outer part of a compound flower head. Ray florets are not always present.

reproduction: the act of generating new plants from parent plants

seed: small part of a flowering plant that is capable of growing a new plant

sepal: parts that look like little leaves or petals that cover the outside of a flower bud to protect the flower until it opens or blooms

stamen: stalk-like part of a flower that produces and bears pollen; male organ of a flower, bearing the anther and filament

stem: the main stalk of a plant that supports the leaves, branches and flowers

stigma: one of the female parts of the flower; the sticky bulb in the center of flowers where the pollen lands to start the fertilization process

style: another female part of the flower; the long stalk that supports the stigma

Parts of a Wildflower Crossword Puzzle

Use the clues and the Word Bank to fill in the puzzle on the next page.

Word Bank

anther	filament	petal	reproduction	stigma
calyx	floret	pistil	seed	style
carpel	flower	pollination	sepal	
corolla	ovary	pollinator	stamen	

Across

1. the movement of pollen from the anther to the stigma, or from the male parts to the female parts of a flower
2. another female part of the flower; the long stalk that supports the stigma
3. part of a plant containing petals and sepals, often marked by a distinctive color or fragrance, where fruit or seeds are generated; part of a plant that ordinarily contains the reproductive organs
4. fine hair-like stalk that supports the anther
5. the act of generating new plants from parent plants
6. stalk-like part of a flower that produces and bears pollen; male organ of a flower, bearing the anther and filament
7. the colorful parts of the flower that often attract pollinators
8. one of the female parts of the flower; the sticky bulb in the center of flowers where the pollen lands to start the fertilization process
9. all the female parts of a plant together

Down

1. organ of a flower that contains the ovule or ovules; female part of the flower made up of four parts — stigma, style, ovary and ovule
2. part of the plant, usually at the base of the flower, that contains ovules and eventually becomes fruit
3. one of the small flowers making up a composite flower
4. yellow, pouch-like part inside of the flower that holds pollen grains, usually located on top of a long stalk that looks like a fine hair
5. small part of a flowering plant that is capable of growing a new plant
6. an organism (usually an insect, bird or small mammal) that moves pollen from the anther of one plant to the stigma of another
7. collective term for the petals of one flower
8. parts that look like little leaves or petals that cover the outside of a flower bud to protect the flower until it opens or blooms
9. collective term for the sepals of one flower

Parts of a Wildflower Crossword Puzzle

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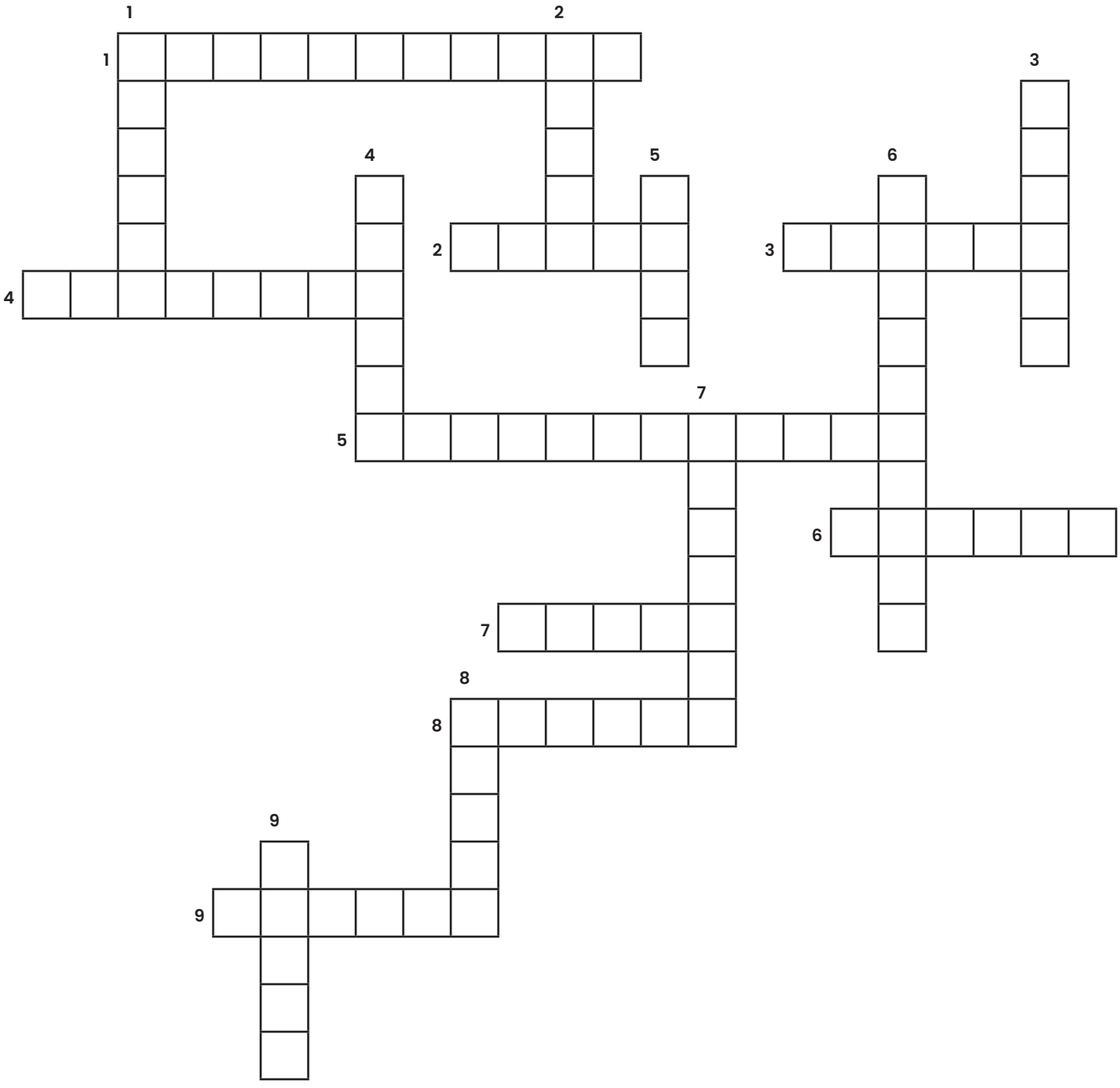

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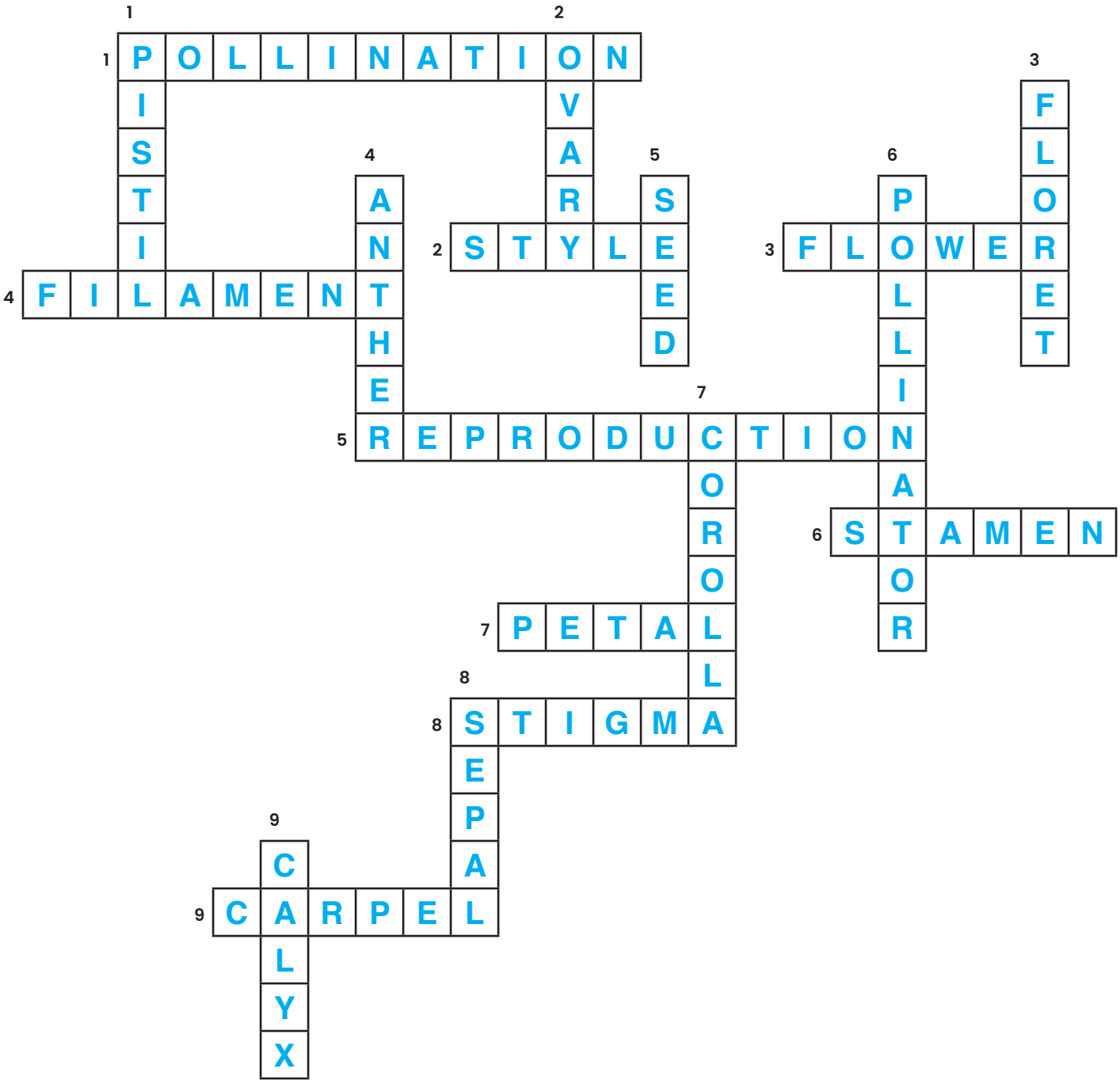

Resources

Literary connections

From Flower to Fruit by Anne Ophelia Downden

The Magic School Bus Plants Seeds: A Book About How Living Things Grow by Joanna Cole

The Nature And Science Of Flowers (Exploring the Science of Nature) by Kim Taylor and Jane Burton

The Secret Lives of Plants! (Adventures in Science) by Janet Slingerland

What Do Roots Do? by Kathleen V. Kudlinski

What's Inside a Flower by Rachel Ignotofsky

Reference books

Complete Guide to Florida Wildflowers by Roger Hammer

Florida Wildflowers in Their Natural Communities by Walter Kingsley Taylor

Plant Life Cycles (Building Blocks of Science), World Book, Inc.

Websites and other web resources

Biology of Plants (Missouri Botanical Garden)
www.mbgnet.net/bioplants/main.html

Florida Wildflower Foundation (plant profiles, photos and other resources on Florida natives)
www.FlaWildflowers.org

Florida's Wildflowers and Butterflies (Florida Museum of Natural History)
www.FloridaMuseum.ufl.edu/wildflowers/wildflower-search

iNaturalist SEEK (image recognition app for identifying plants and animals)
www.iNaturalist.org/pages/seek_app

Lady Bird Johnson Wildflower Center (national database; search by state, family or habitat)
www.Wildflower.org/plants-main

Plant Morphology (American Museum of Natural History)
www.amnh.org/explore/curriculum-collections/biodiversity-counts/plant-identification/plant-morphology