

24.1 Reproduction in Flowering Plants

Lesson Objectives

- 🔑 Identify the functions of various structures of a flower.
- 🔑 Explain how fertilization differs between angiosperms and other plants.
- 🔑 Describe vegetative reproduction.

Lesson Summary

The Structure of Flowers Four different kinds of specialized leaves form flowers.

- ▶ Sepals form the outermost circle of flower parts. They protect a flower bud.
- ▶ Petals form a ring just inside the sepals. Some are brightly colored, which attracts pollinators.
- ▶ **Stamens** are the male reproductive structures and form a ring inside of the petals. Pollen is produced in an **anther**, which is the sac at the tip of a stamen. Each pollen grain contains a male gametophyte.
- ▶ **Carpels** are the female reproductive structures at the center of flowers. The female gametophytes develop inside the ovules that form in a carpel's ovary.
 - The sticky tip of a carpel, called the **stigma**, captures pollen.
 - A **pistil** is a structure that is made up of one or more carpels.

The Angiosperm Life Cycle The life cycle involves alternation of generations.

Meiosis in stamens and carpels produces haploid cells (spores) that develop into gametophytes.

- ▶ The haploid cells in a stamen's anther undergo mitosis and form pollen grains, the male gametophytes, that contain 2 sperm nuclei.
- ▶ A haploid cell in each ovule of a carpel undergoes mitosis to produce an **embryo sac**, or female gametophyte, which contains 8 haploid nuclei. One of these nuclei becomes the egg.
- ▶ Pollen grains are transported to the stigmas of carpels during pollination.
- ▶ Both sperm nuclei fuse with nuclei in the embryo sac in a process called **double fertilization**. One sperm fuses with the egg to form a diploid (2N) zygote. The other sperm fuses with 2 other nuclei to form the triploid (3N) **endosperm**.

Vegetative Reproduction Asexual reproduction is common in plants.

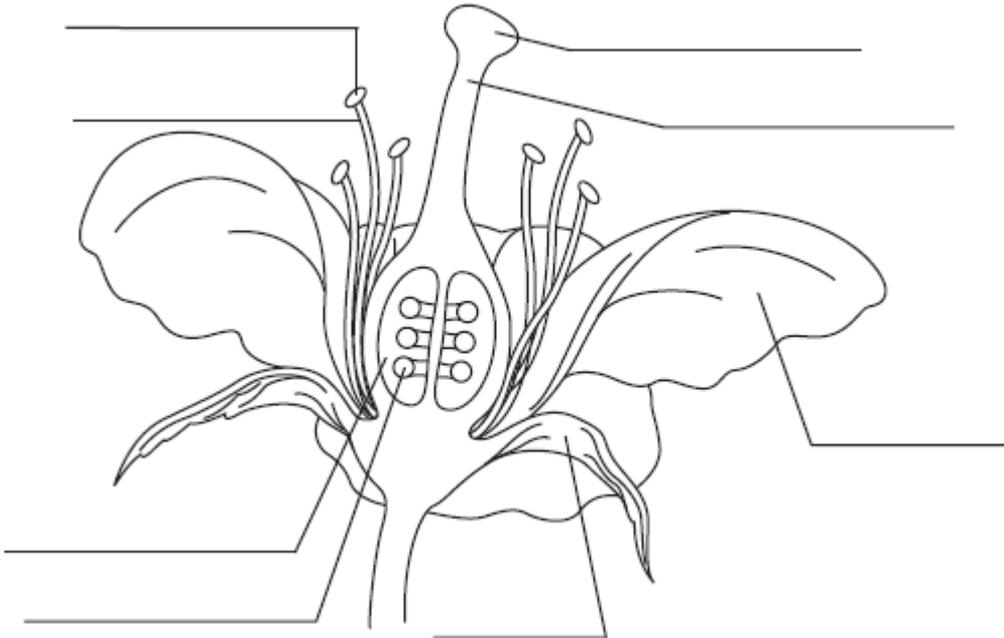
- ▶ **Vegetative reproduction** leads to offspring that are identical to the parent. The offspring develop by mitotic cell division of cells in stems, leaves, and roots.
- ▶ Horticulturists use vegetative reproduction to propagate (grow) many identical plants. Making cuttings of stems and roots is one example. **Grafting** involves attaching a bud or a stem of one woody plant to the stems of another.

The Structure of Flowers

For Questions 1–10, match the floral part with its description.

Floral Part	Description
_____ 1. anthers	A. Stalk with a stigma at the top
_____ 2. carpels	B. Structures that produce male gametophytes
_____ 3. filament	C. Structure that contains one or more ovules
_____ 4. ovary	D. Outermost circle of green floral parts
_____ 5. petals	E. Long, thin structure that supports an anther
_____ 6. pollen	F. Floral parts that produce female gametophytes
_____ 7. sepals	G. Yellowish dust that contains male gametophytes
_____ 8. stamen	H. Male structure with an anther and a filament
_____ 9. stigma	I. Brightly colored parts just inside the sepals
_____ 10. style	J. Sticky, top portion of style

11. Complete the illustration by labeling the parts of the flower indicated.



The Angiosperm Life Cycle

For Questions 12–15, complete each statement by writing the correct word or words.

- The body of an adult plant with flowers is the _____ generation of the plant's life cycle.
- The gametophytes of angiosperms have cells with nuclei that have the _____ number of chromosomes.

14. A male _____ of an angiosperm is a pollen grain.

15. A(n) _____ contains a female gametophyte of an angiosperm.

For Questions 16–20, write *True* if the statement is true. If the statement is false, change the underlined word or words to make the statement true.

_____ 16. In pollination, pollen grains are transferred to the ovary of a flower.

_____ 17. A pollen tube delivers one sperm to an ovule.

_____ 18. The fertilized egg in an ovule becomes the zygote of a new sporophyte.

_____ 19. Triploid tissue, called endosperm, forms in double fertilization.

_____ 20. A fertilized embryo sac then develops into a seed.

Vegetative Reproduction

21. What is vegetative reproduction in plants?

22. Give an advantage and a disadvantage of vegetative reproduction to plants.

23. Complete the table to summarize asexual reproduction in plants.

Vegetative Reproduction in Plants		
Reproductive Method	Vegetative Parts Involved	Example
Stolons		
Tubers		
Grafts		

Apply the Big idea

24. How might a long period of rainy weather affect reproduction in wind-pollinated plants?
