

Name \_\_\_\_\_ Period \_\_\_\_\_

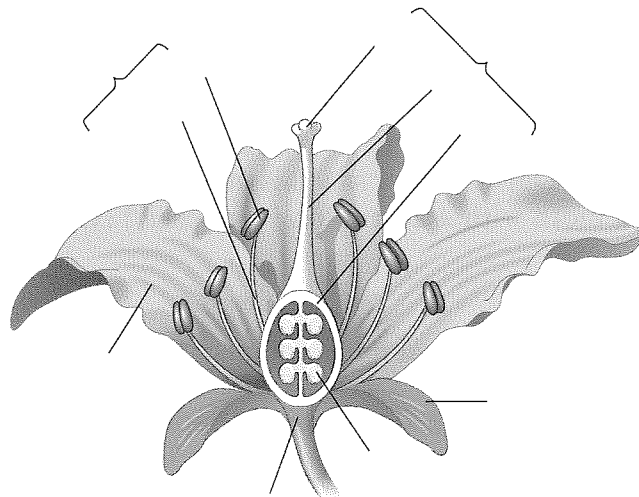
**Chapter 38: Angiosperm Reproduction and Biotechnology**

This chapter will look at specifics of angiosperm reproduction. Focus on evolutionary adaptations and how these increase fitness as you work through this material. We have tried to highlight the areas of this chapter that tie into the AP Biology Curriculum Framework.

**Concept 38.1 Flowers, double fertilization, and fruits are key features of the angiosperm life cycle**

This may be a good time for you to go back to Chapter 29 and review alternation of generations, a key feature of plant life cycles (Figure 29.3 is a good starting point). The angiosperm life cycle has three unique features, all of which start with the letter *F*, which provides a good memory aid: *Flowers*, *Fruits*, and double *Fertilization*. You will want to remember these!

1. On this sketch of a flower, label all floral parts and give the function of each. Label also the *stamen* and *carpel*. Then, circle the flower parts that are essential for reproduction.

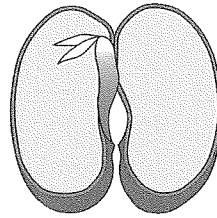


2. Figure 38.3 explores four trends in the evolution of flowers. The important task here is to understand how the trend allows for greater evolutionary fitness by the plant. In the table below, list the four trends, then explain how the trend increases fitness.

Trend in the Evolution of Flowers	How the Trend Increases Fitness

3. The life cycle of an angiosperm in Figure 38.4, page 819, is imposing, but you already have the core knowledge base to understand the main ideas.
  - a. By what process, inside the ovary of the carpel, will a haploid egg and two haploid polar bodies (among other cells and nuclei) form?
  - b. By what process, inside the anther of the stamen, will each pollen grain eventually form two sperm nuclei and one pollen tube nucleus?
  - c. The next key process is fertilization. What is formed when a sperm nucleus combines with the egg nucleus?
  - d. What is the triploid ( $3n$ ) tissue that is formed when the other sperm nucleus combines with both polar bodies?
4. Explain the process of double fertilization.
5. After double fertilization, each ovule develops into a \_\_\_\_\_, while the ovary develops into the \_\_\_\_\_.
6. What is the difference between pollination and fertilization?
7. The story of the Madagascar orchid and its pollinator is too good to miss! Take a good look at Figure 38.6 in your text. Darwin never saw this moth, but why did he make a prediction that explorers would find a moth with a 28-cm-long proboscis? (Use the term *coevolution* in your response.)
8. Before we leave this section, a few final review points:
  - a. The chromosome number of the *endosperm* is (a) haploid, (b) diploid, or (c) triploid? \_\_\_\_\_
  - b. The chromosome number of the *zygote* is (a) haploid, (b) diploid, or (c) triploid? \_\_\_\_\_
  - c. What is the role of the *endosperm*?
  - d. After double fertilization, what does each ovule become? \_\_\_\_\_
  - e. After double fertilization, what does each ovary become? \_\_\_\_\_
9. Let's compare the seeds of *eudicots* and *monocots*. How many cotyledons does each type have?
10. What is the function of a *seed coat*?

11. Use the figure to label the *seed coat*, *cotyledons*, and the *embryonic plant*.



12. Explain how *seed dormancy* is an evolutionary adaptation that increases fitness.
13. What are some mechanisms that maintain seed dormancy?
14. What is *imbibition*? How do changes in the environment result in cues that cause molecular changes in the seed?
15. To a botanist, a *fruit* is a ripe \_\_\_\_\_. It does not have to be sweet! A pea pod is a fruit. A green pepper is a fruit.
16. An important function of the fruit is to aid in *dispersal*. Study Figure 38.12 in your text. What are three primary methods of dispersal and an example of each?

**Concept 38.2 Flowering plants reproduce sexually, asexually, or both**

17. *Asexual reproduction* in plants is also known as *vegetative reproduction*. Describe two different types of asexual reproduction in plants.
18. From an evolutionary perspective, what are the advantages and disadvantages of asexual and sexual reproduction in plants?
19. Why is it important for plants to have mechanisms to prevent self-fertilization?
20. What are two mechanisms to prevent self-fertilization?

**Concept 38.3 People modify crops by breeding and genetic engineering**

21. What is a transgenic organism? How does the *Bt* toxin affect plant yields and therefore world hunger?

22. *Genetically modified organisms (GMOs)* offer great promise but are also controversial. What are three of the possible risks?
- a.
  - b.
  - c.

*Test Your Understanding Answers*

Now you should be ready to test your knowledge. Place your answers here:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_  
6. \_\_\_\_\_ 7. \_\_\_\_\_