

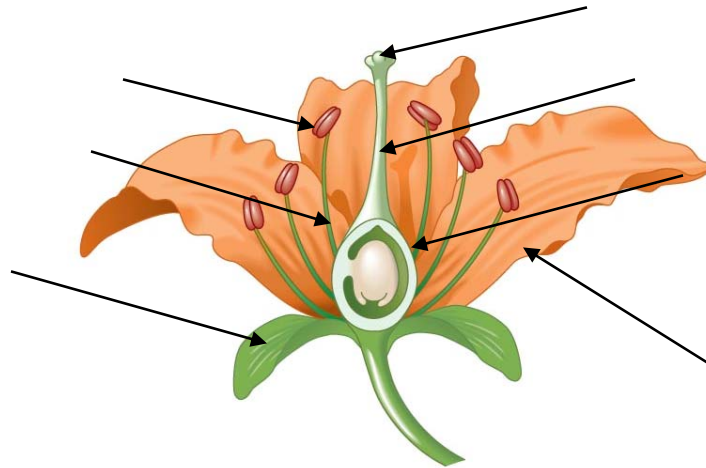
Name \_\_\_\_\_ Period \_\_\_\_\_

**Chapter 38: Angiosperm Reproduction and Biotechnology**

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

This may be a good time for you to go back to Chapter 29 and review alternation of generation and the terms associated with it. Figure 29.5 would be a good starting point. Then, review Concepts 30.1 and 30.3 on angiosperm life cycles. The angiosperm life cycle has three unique features, all of which start with the letter *F*, a good memory aid: *F*lowers, *F*ruits, and double *F*ertilization. You will want to remember these!

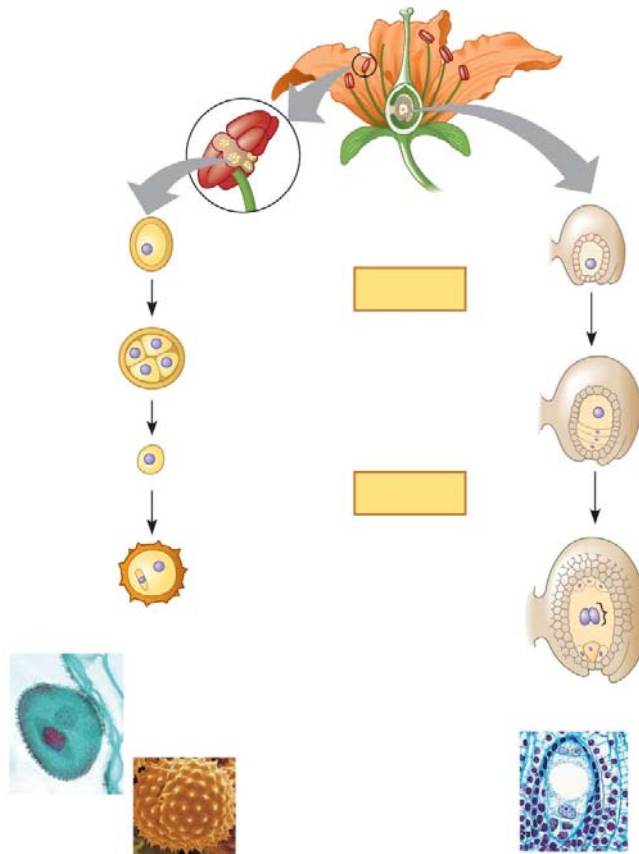
- On this sketch of a flower, label all floral parts and give the function of each. Label also the *stamen* and *carpel*. Then, circle the flower parts that are essential for reproduction.



- What is another name for the *microsporangia*?
- Each *microspore mother cell* undergoes meiosis to form four haploid \_\_\_\_\_.
- Each *microspore* undergoes mitosis to produce the male \_\_\_\_\_.
- The male gametophyte is composed of only two cells. Name each cell, and tell what will come from each of them.

Male Gametophyte Cells	What does cell produce?

6. What makes up a *pollen grain*?
7. Label these parts: *anther*, *pollen sac*, *microspores*, *male gametophyte*, *pollen grain*, *generative cell*, *tube cell*, *megasporangium*, *megaspore mother cell*, *embryo sac*, *surviving megaspore*, *polar nuclei*, *synergids*, and *egg*.



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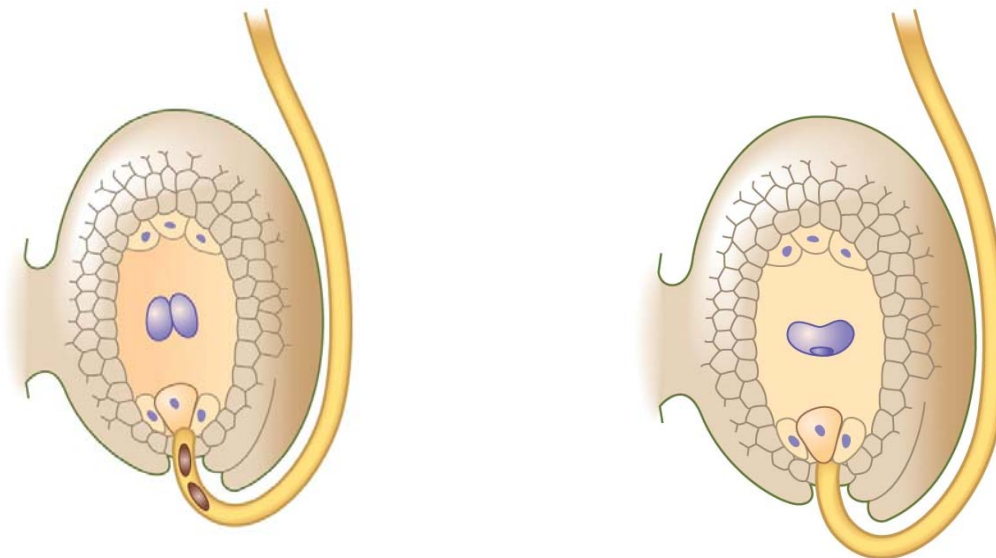
8. Meiosis in the female part of the plant produces four megaspores. How many survive?
9. What occurs in *pollination*? Annotate the figure to the right to explain pollination.



10. List five modes of pollination. For each mode, describe a feature of the flower that aids pollination.

Mode	Feature of Flower

11. Study the section in this concept under the heading “Double Fertilization” very carefully. Label the figures below to show two *sperm nuclei*, *pollen tube*, *female gametophyte*, *ovule*, *synergids*, *polar nuclei*, *egg*, and *zygote*. Describe what is happening in each sketch.

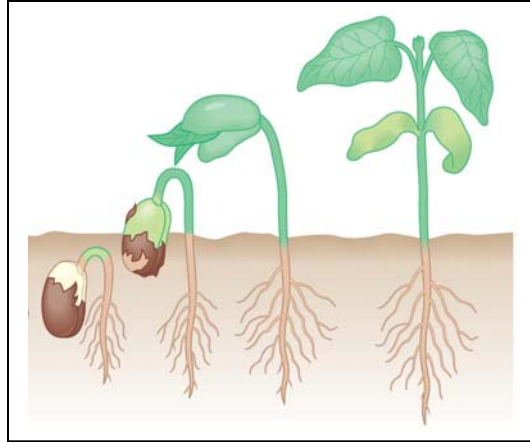
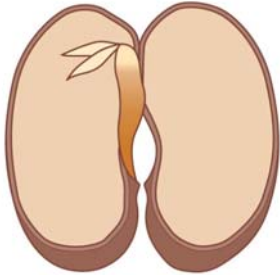


12. Study the figure on the left above. You should be able to count a total of 7 cells and 8 nuclei. Which of these are fertilized in *double fertilization*?

13. When the *polar nuclei* are fertilized, what is formed? \_\_\_\_\_

14. The chromosome number of *endosperm* is (a) haploid, (b) diploid, or (c) triploid.
  
15. The chromosome number of the *zygote* is (a) haploid, (b) diploid, or (c) triploid.
  
16. What is the role of the *endosperm*?
  
17. After double fertilization, what does each ovule become?
  
18. After double fertilization, what does each ovary become?
  
19. Let's compare the seeds of *eudicots* and *monocots*. How many cotyledons does each type have?
  
20. What is the function of a *seed coat*?
  
21. What part of the embryo plant emerges first?
  
22. What are some mechanisms that maintain *seed dormancy*?

23. Below are sketches of a bean seed and a corn seed. Label them to show: *monocot*, *eudicot*, *cotyledons*, *radicle*, *hypocotyl*, *epicotyl*, *seed coat*, and *endosperm*. You may use the same term several times.



24. What is *imbibition*?
25. 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.
26. An important function of the fruit is to aid in *dispersal*. What are three primary methods of dispersal?

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

27. *Asexual reproduction* in plants is also known as *vegetative propagation*. Describe three different types of asexual reproduction in plants.
28. Why is it important for plants to have mechanisms to prevent self-fertilization?

29. What are two mechanisms to prevent self-fertilization?

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

30. Humans have used selective breeding to develop useful varieties since the dawn of agriculture. Today, *biotechnology* has accelerated the introduction of desirable traits. List four genetically modified plant species, and describe the advantage each species shows.
- a.
  - b.
  - c.
  - d.
31. *Genetically modified organisms (GMOs)* offer great promise but are also controversial. What are three of the possible risks?
- a.
  - b.
  - c.

***Testing Your Knowledge: Self-Quiz Answers***

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

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_ 7. \_\_\_\_\_  
8. \_\_\_\_\_ 9. \_\_\_\_\_ 10. \_\_\_\_\_