

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

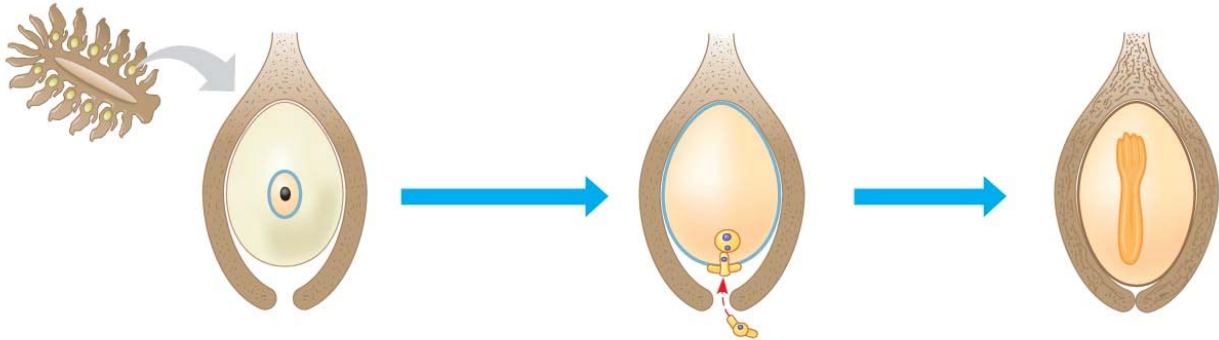
## Chapter 30: Plant Diversity II: The Evolution of Seed Plants

In this second chapter on the evolution of plants, it is important to know enough terminology to understand the major evolutionary trends. As you work through this chapter, keep working to see the big picture and try not to get lost by too many new terms. Be patient.

### *Concept 30.1 Seeds and pollen grains are key adaptations for life on land*

1. List five characteristics common to all seed plants.
2. In seed plants, the evolutionary trend of gametophyte reduction continues. List four advantages the plant gains by the miniaturization of the gametophyte.
3. *Heterospory* indicates that the plant produces two kinds of spores: *megaspores* and *microspores*. Explain what each type of spore forms as it develops.  
  
**megaspore**  
  
**microspore**
4. Inside each \_\_\_\_\_, a female \_\_\_\_\_ develops from a megaspore and produces one or more \_\_\_\_\_.
5. A microspore develops into a \_\_\_\_\_ that consists of a male \_\_\_\_\_ enclosed within the pollen wall.

6. What is the purpose of *pollination*?
  
7. What are two advantages of pollen over free-swimming sperm?
  
8. What are three advantages of seeds over spores?
  
9. Using Figure 30.3 as a guide, label all parts of this figure. Then, below each of the three drawings, explain what is occurring.



**Concept 30.2 Gymnosperms bear “naked” seeds, typically on cones**

10. Figure 30.5 shows the four phyla of gymnosperms. The phylum *Coniferophyta* will most likely be the one with which you are most familiar. What are five examples of the *Coniferophyta*?

11. Understanding the life cycle of the pine should bring together the essential characteristics of gymnosperms. Following Figure 30.6, label and give eight brief explanations of the important features of the pine life cycle.



*Study Hint:* Continue to look for the big picture. Microspores will eventually produce pollen that will contain sperm nuclei. Megaspores will eventually produce archegonia that will contain eggs. The sperm and egg will unite to form a diploid embryo. The basics are the same as with any sexually reproducing organism.

**Concept 30.3 The reproductive adaptations of angiosperms include flowers and fruits**

12. Concerning seeds, what is the difference between gymnosperms and angiosperms?
13. What is the specialized function of the *flower*?

14. Label the ten structures on the flower diagram. Briefly give the function of each labeled part.



15. A fruit consists of a mature \_\_\_\_\_.
16. List the two functions of fruits.
17. What is the difference between cross-pollination and self-pollination? What is the evolutionary advantage of cross-pollination?
18. What two events occur during *double fertilization*?
19. In the space below, draw the essential features of the life cycle of an angiosperm. Use Figure 30.10 as a guide, but simplify the labeling to reflect only the most important terms. After sketching and labeling, use your own phrasing to explain the process in seven concise steps.

20. After double fertilization, the ovule matures into the \_\_\_\_\_. The zygote develops into the sporophyte \_\_\_\_\_. The embryo is nourished by a tissue called the \_\_\_\_\_.
21. The two largest groups of angiosperms are *monocots* and *eudicots*. Flowering plants can often be placed in one of these two categories by easy-to-observe characteristics. Label the following portion of Figure 30.13 showing key differences between the two groups.



***Concept 30.4 Human welfare depends greatly on seed plants***

22. Explain the importance of seed plants to humans in the following areas:

**food**

**wood**

**medicines**

23. Why should threats to plant diversity be taken seriously?

*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. \_\_\_\_\_