

Name _____ Period _____

Chapter 29 Plant Diversity I: How Plants Colonized Land

Concept 29.1 Land plants evolved from green algae

1. Plants colonized land about 500 million years ago. Which group of algae is believed to be the ancestors of land plants?
2. Perhaps you answered *green algae* to question 1, which would be correct, or *charophytes*, which are a lineage of green algae and a more precise answer that is also correct. Whatever your response was, modify your answer above to include the other term. Read this section and you will review a number of traits of plants that they share with various groups of algae. We are most interested in those adaptations that are unique to plants and enabled life on land. One trait that is shared with the *charophytes* is *sporopollenin*. What is it, and why is it important?
3. Study Figure 29.5, which shows the four key traits that appear in nearly all land plants but not in the charophytes. You are about to encounter a large new vocabulary. We will use it through the next few chapters, so it is essential to master. Let's begin by just defining the terms.

alternation of generation

sporophyte

gametophyte

fertilization

zygote

spore

sporangia

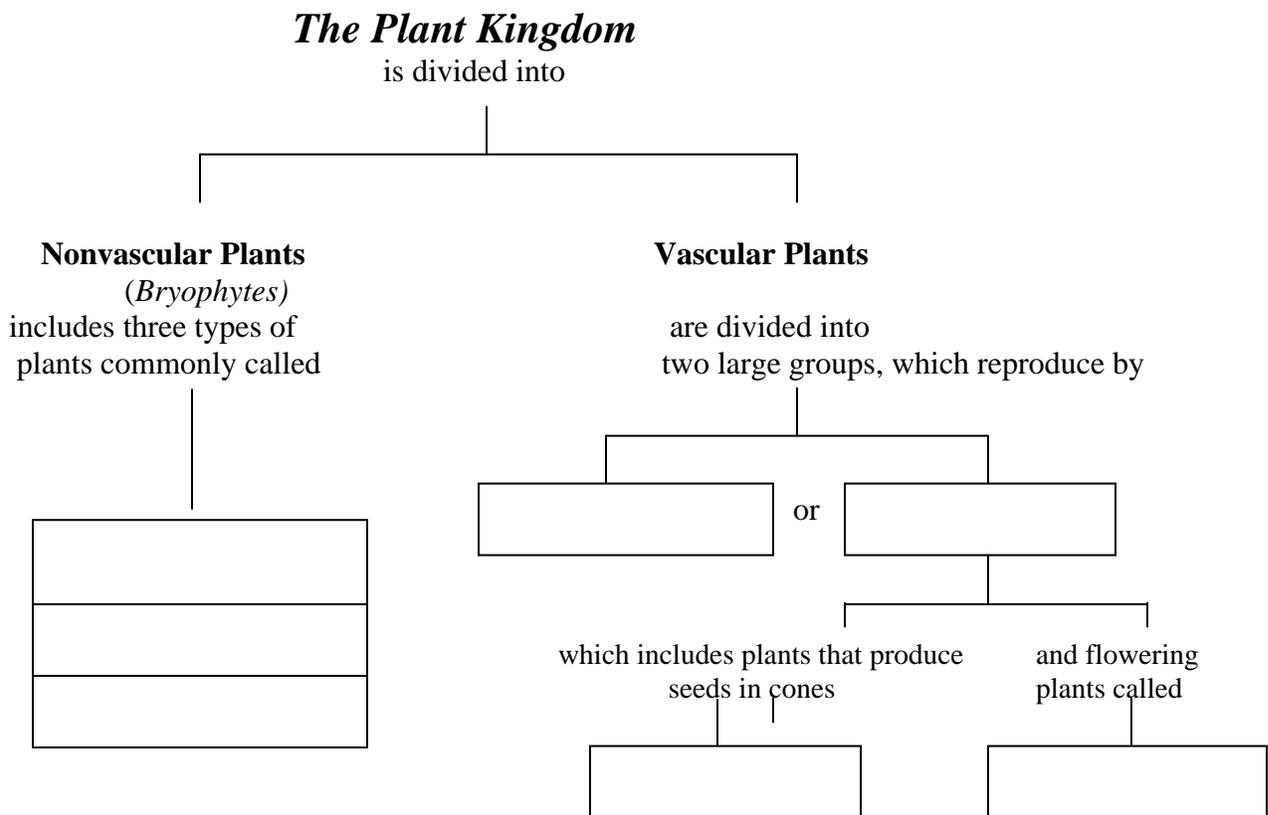
archegonia

antheridia

apical meristem

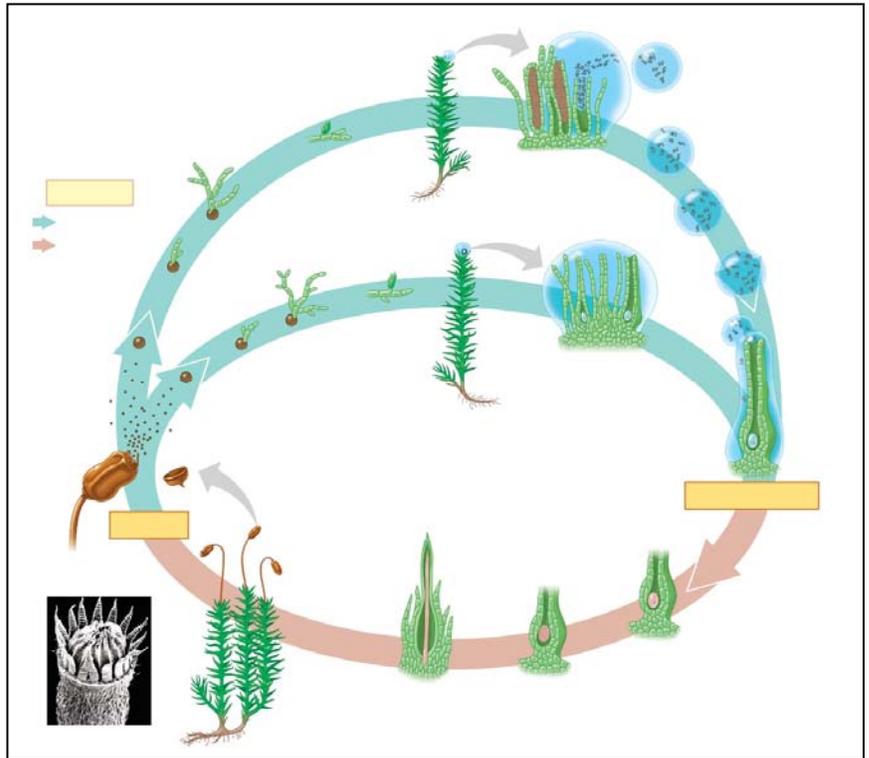
We will apply these terms in the next concept.

4. Now let's organize the plant groups. Complete the concept map that follows to show how plants are classified.



Concept 29.2 Mosses and other nonvascular plants have life cycles dominated by gametophytes

5. As you recorded in question 3, an important feature of plants is *alternation of generations*. It is time now to learn how this process works, and a study of the moss life cycle is a good place to begin. Label the following features: *male gametophyte*, *antheridia*, *female gametophyte*, *archegonia*, *egg*, *zygote*, and *sporophyte*. Indicate the haploid and diploid part of the life cycle.



6. What is made in the *antheridium*? _____ in the *archegonium*?

7. What is made by the *gametophyte* generation?

8. What is made by the *sporophyte* generation? _____

9. Where does meiosis occur?

10. In animals, the gametes are formed by meiosis. However, in plants, what cells are formed by meiosis? _____
11. How are spores dispersed?

12. How does the sperm reach the egg? _____
13. On this picture of a moss, label the *sporophytes* and *gametophytes*. Which generation is *haploid*? Which is *diploid*?

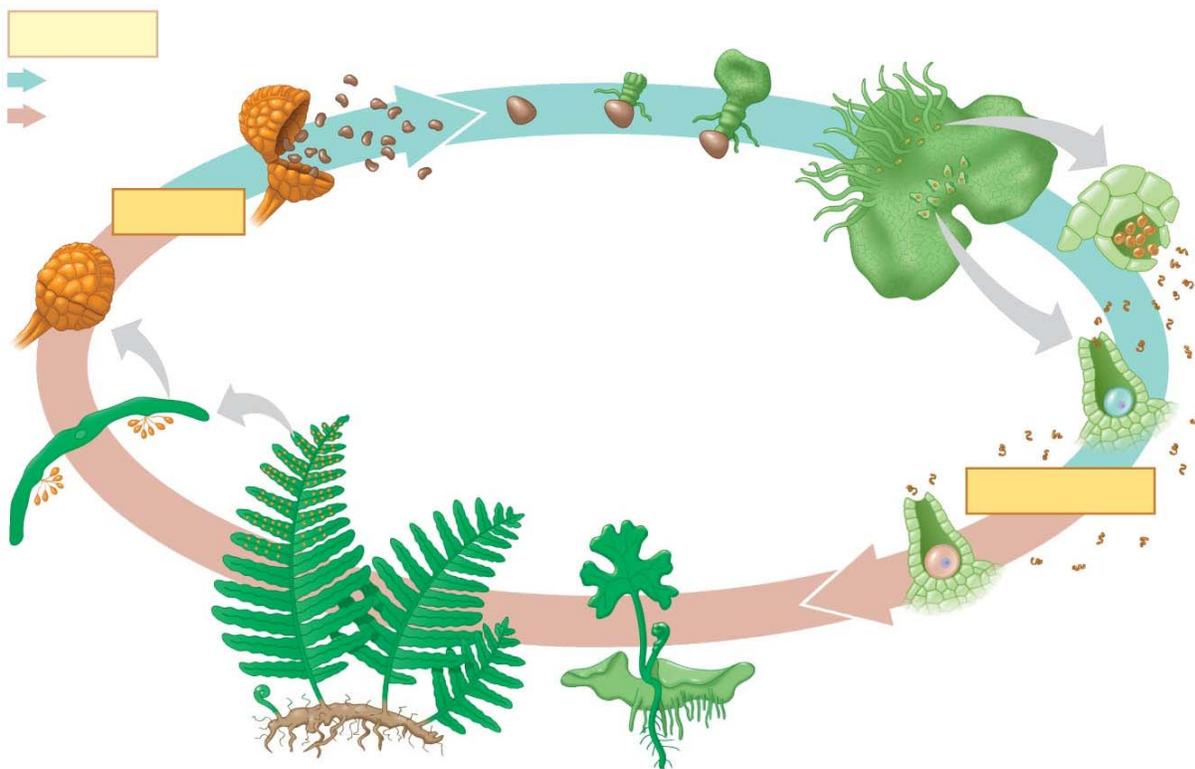


14. How do mosses absorb water? How is it distributed?
15. Which moss generation is *dominant*? It is larger, longer-living, independent, and photosynthetic. It is the generation that you will always see.

Concept 29.3 Ferns and other seedless vascular plants were the first plants to grow tall

16. Like the Bryophyta, ferns are most common in damp environments. What feature of their reproduction requires them to live in a moist habitat?
17. What are the two types of *vascular tissue*? What does each transport?
18. *Ferns* are vascular plants. Why can vascular plants grow to be very tall, but nonvascular plants are all tiny?

19. *Lignified* vascular tissue allows vascular tissues to grow very tall. How does this give vascular plants a competitive edge?
20. What are functions of *roots*?
21. Go back to page 604 in your text to answer this: What are *mycorrhizae*? Without true roots, how do bryophytes absorb nutrients from the soil?
22. What is the function of *leaves*?
23. To summarize, only plants with vascular tissue can have true roots, stems, and leaves. Ferns and their relatives are seedless vascular plants. You will see examples of club mosses, horsetails, and more in Figure 29.15. Have you ever seen any of the plants pictured here?
24. Let's conclude this chapter with a look at the life cycle of a fern. Use this to solidify your understanding of alternation of generations. Label the following elements: *sporangium*, *meiosis*, *spore*, *gametophyte*, *antheridium*, *archegonium*, *sperm*, *egg*, *fertilization*, *zygote*.



25. Which generation is dominant in ferns? Is it haploid or diploid?
26. Throughout this chapter, we have looked at problems of a terrestrial life faced by plants. Use the following chart to summarize the solutions that are seen to some of these problems.

PROBLEM	SOLUTIONS
1. Obtain water	
2. Transport water	
3. Transport products of photosynthesis	
4. Prevent desiccation of embryo	
5. Prevent desiccation of plant body	
6. Support against gravity	
7. Protect embryo	
8. Transport sperm	
9. Increase surface area for photosynthesis	

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. _____