

## Chapter 22 Assessment

### Reviewing Content

1. b    5. d    9. c  
2. b    6. b    10. c  
3. d    7. a  
4. c    8. d

### Understanding Concepts

11. The two alternating phases of a plant's life cycle: the gametophyte, or haploid phase, and the sporophyte, or diploid phase.
12. The fact that some green algae resemble small plants in color and shape. Green algae also have photosynthetic pigments, cell walls, and reproductive cycles that are similar to those in plants.
13. Botanists divide the plant kingdom into four groups based on water-conducting tissues, seeds, and flowers.
14. Because they lack vascular tissue, bryophytes draw up water by osmosis.
15. Bryophytes depend upon the presence of water to complete their life cycle, because the only way the sperm can reach the egg is to swim through standing water or dew.
16. In bryophytes, a protonema is the tangled mass of green filaments that forms the young gametophyte. It is haploid.
17. Tracheids are hollow cells with thick cell walls that make up xylem. The function of tracheids is to transport water through a plant.

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18. The evolution of lignin made the cell walls of plants rigid. This enabled plants to grow upright and reach great heights.
19. The dominant stage in the life cycle of a fern is the diploid sporophyte, which when mature consists of roots, underground stems called rhizomes, and fronds, which are large leaves. On the undersides of the fronds grow small containers called sporangia, which grow in clusters called sori that release spores.
20. Rhizoids are long, thin cells that anchor bryophytes in the ground and absorb water and minerals. The water moves from cell to cell through the rhizoids to the rest of the plant. Rhizomes are creeping or underground stems that live through the winter and produce new leaves in spring. Roots are underground organs that absorb water and minerals from the soil.
21. In seed plants, the male gametophyte is contained in pollen grains.

22. Features of conifers that suggest they evolved to live in dry habitats include long, thin needles to reduce the surface area of their leaves; the leaves' waxy outer covering; and the placement of leaf openings in cavities in the surface of the leaves to reduce water loss by evaporation.

23. Angiosperms contain the most living species.

24. Fruits attract and are eaten by animals that spread the seeds enclosed in the fruits widely, increasing the ranges that the angiosperms inhabit.

25. Drawings should show that monocots have leaves with parallel veins. Dicots have leaves with branched veins.

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### Critical Thinking

26. Student answers should be consistent with the information in the chapter.
27. Vascular tissue supports a tall plant and carries water and nutrients from the soil to its upper regions. Thus, ferns, which have vascular tissue, grow tall, whereas moss plants cannot grow tall, because they lack vascular tissue. Plants require a method to transport water and nutrients throughout the plant body in order to survive.
28. She needs to provide constant moisture for the mosses and liverworts and protection from too much sun.
29. Student answers should reflect the concept that angiosperms have protected seeds and many ways in which the seeds can be dispersed, which increase the chances of survival.
30. The rootlike structures, similar to rhizoids, might have been used for transport of water and minerals. The branched stalks have capsulelike structures on the ends that might have been used for reproduction.
31. *Cooksonia* resembles mosses living today. Both have simple structures and grow close to the ground. They have similar rootlike structures and reproductive structures. Mosses today have more complex leaflike structures absent in *Cooksonia*.

32. Essays should include the major characteristics of plants: multicellular eukaryotes with cell walls made of cellulose; multicellular embryos; photosynthetic pigments, chlorophyll *a* and *b*. Students should also describe the characteristics of bryophytes, seedless vascular plants, gymnosperms, and angiosperms that are used to classify these plant groups. Last, students should explain how similarities in DNA sequences are used to show which plant species are more closely related.

33. Concept maps should show vascular tissue as the main system with xylem and phloem branching off it as subsystems. Tracheids should branch off xylem as cells that carry water. Branching off phloem should be cells that transport dissolved nutrients.

34. The plant is a monocot, since monocots can have floral parts in multiples of three.

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## Standardized Test Prep

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|------|------|-------|
| 1. E | 5. B | 9. B  |
| 2. B | 6. A | 10. C |
| 3. C | 7. D | 11. B |
| 4. B | 8. C |       |