

## Chapter 24 Assessment

### Reviewing Content

1. a      5. b      9. c  
2. a      6. a      10. d  
3. a      7. d      11. c  
4. a      8. a

### Understanding Concepts

12. A gametophyte plant produces male and female gametes (sperm and eggs). A sporophyte plant produces spores.
13. An ovule is a structure in which the female gametophyte develops. When a pollen grain reaches an ovule, the grain splits open and grows a pollen tube, which contains two haploid sperm nuclei. Once the pollen tube reaches the female gametophyte, one sperm nucleus disintegrates and the other fertilizes the egg within the female gametophyte.
14. Male pollen cones produce male gametophytes called pollen grains. Later, one of the nuclei in the pollen grain divides to produce two sperm nuclei.
15. Check students' diagrams against Figure 24-4 for accuracy.
16. The carpel, which produces the female gametophytes, is the innermost part of the flower. Each carpel has a broad base that contains an ovary. The diameter narrows into a stalk called the style. At the top of the style is the stigma.
17. Pollen may be transferred from plant to plant by wind, insects, birds, or bats.

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18. Germination is followed by growth of the sporophyte. In anthers, cells undergo meiosis, reproducing haploid spore cells that develop into pollen grains. In ovules, cells undergo meiosis, producing eggs. Pollen grains are released from the anther and deposited on a stigma. After pollination and fertilization, eggs develop into zygotes, ovules develop into seeds, and ovaries develop into fruits. Seeds are dispersed, and the cycle repeats.
19. Seed dormancy can allow for long-distance dispersal, and it may allow seeds to germinate under ideal conditions.
20. Vegetative reproduction is asexual reproduction in which new plants are produced from horizontal stems, plantlets, or underground roots.

21. Plants can be propagated asexually by cuttings, grafting, and budding. In cuttings, a length of stem is cut and placed in a rooting mixture. In grafting and budding, a piece of a parent plant is attached to another plant.

22. Endosperm is the stored food supply in angiosperm seeds that nourishes the embryo plant.

### Critical Thinking

23. It provides a sticky landing site for pollen grains. Without it, pollen grains would not stick to the cones and fertilization would not occur.
24. Fruit could not form on flowers that lack carpels because fruit develops from the ovary, which is part of the carpel.
25. If pollen grains of wind-pollinated flowers were sticky, they might stick to anything, not just the female flowers. To test their answers, students should suggest a controlled experiment.
26. One possible answer is that, in such harsh environments, a seed might have to wait many years before suitable conditions for germination and growth occur.
27. Students' experimental designs will vary. One possible answer is to choose seeds with large cotyledons and remove the cotyledons before planting. Leave the cotyledons on some seeds as a control.
28. In monocots, the single cotyledon remains within the seed. The growing shoot emerges while protected by a sheath. In some species of dicots, the cotyledons emerge above the ground and protect the first foliage leaves. In other species, the cotyledons remain below the ground, providing a food source for the developing seedling.
29. The seed needs water from the soil for germination. The root emerges first to obtain water and nutrients from the soil.
30. Pollen is produced inside the anthers, labeled C. The stigma is labeled A; it is where pollen grains land. Seeds develop in the ovary, labeled F. A sepal is labeled G and a petal is labeled H.
31. Grafting is the method of artificial propagation that fuses together pieces of two different plants, so it would be an appropriate method for producing an apple tree that will bear two different kinds of apples. Cuttings, however, generate clones of a plant but do not combine two different plants.

## Standardized Test Prep

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