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Section 22–4 Seed Plants (pages 564–568)

Key Concepts

- What adaptations allow seed plants to reproduce without standing water?
- What are the four groups of gymnosperms?

Introduction (page 564)

1. Complete the table about the two groups of seed plants.

SEED PLANTS

Group	Description	Examples
	Seed plants that bear seeds directly on the surfaces of cones	
	Seed plants that bear their seeds within a layer of protective tissue	

Reproduction Free From Water (pages 564–565)

2. What are three features that allow seed plants to reproduce without water?

a. _____

b. _____

c. _____

3. What are cones and flowers? _____

_____

_____

_____

4. Why don't the gametophytes or the gametes of seed plants need standing water to function? _____

_____

_____

_____

5. What is pollination? _____

_____

_____

_____

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Match the structure with its description.

	Structure	Description
_____	**6.** pollen grain	**a.** An embryo encased in a protective covering
_____	**7.** seed	**b.** Structure that surrounds and protects the plant embryo
_____	**8.** endosperm	**c.** Early developmental stage of an organism
_____	**9.** embryo	**d.** Male gametophyte of seed plants
_____	**10.** seed coat	**e.** Seed's food supply

11. What tissues or structures do seeds have that aid in their dispersal to other habitats?

_____

_____

12. What is the strategy that allows seeds to survive long periods of bitter cold, extreme heat, or drought? _____

_____

_____

_____

Evolution of Seed Plants (page 566)

13. How did conditions on Earth change during the Carboniferous and Devonian periods, and how did those changes affect plants? _____

_____

_____

_____

_____

_____

14. What link do seed ferns represent in the fossil record? _____

_____

_____

_____

15. What adaptations did seed plants have that allowed them to replace spore-bearing plants as continents became drier? _____

_____

_____

_____

_____

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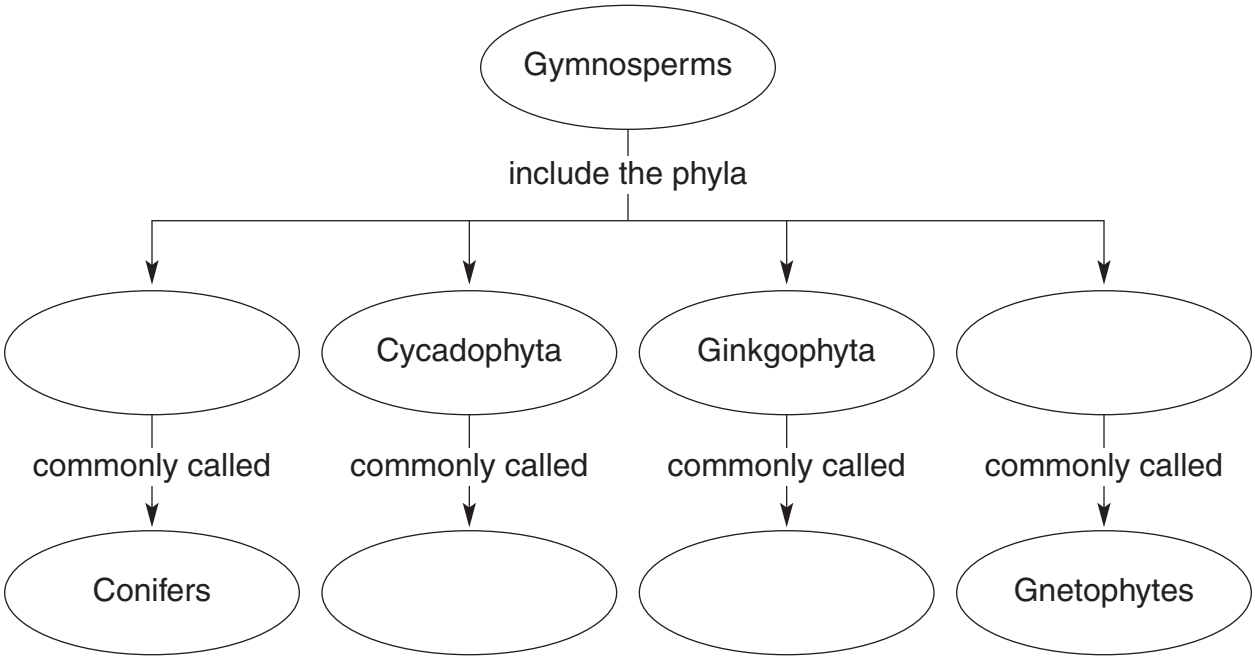
Gymnosperms—Cone Bearers (pages 566–568)

16. Complete the concept map about gymnosperms.



17. Where are the reproductive scales of gnetophytes found? _____

_____

18. What do cycads look like? _____

_____

19. In what kinds of habitats can cycads be found growing naturally today?

_____

_____

20. Why is the ginkgo tree sometimes called a living fossil? _____

_____

_____

21. What kinds of plants do conifers include? _____

_____

_____

22. Why are the leaves of most conifers long and thin, such as pine needles?

_____

_____

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23. In addition to the shape of the leaves, what are two other adaptations that help conifers conserve water?

a. _____

b. _____

_____

24. Circle the letter of the reason conifers never become bare.

a. They never lose their needles.

b. The gametophyte supplies needles to the sporophyte.

c. Older needles are gradually replaced by newer needles.

d. The needles conserve water throughout the year.

25. How are larches and baldcypresses different from most other conifers?

_____

_____