

**SECTION 22-1 REVIEW**

**PLANT DIVERSITY**

**VOCABULARY REVIEW Define the following terms.**

- 1. cellulose \_\_\_\_\_  
\_\_\_\_\_
- 2. chlorophyll a and b \_\_\_\_\_  
\_\_\_\_\_
- 3. sporophyte \_\_\_\_\_  
\_\_\_\_\_
- 4. gametophyte \_\_\_\_\_  
\_\_\_\_\_
- 5. vascular tissue \_\_\_\_\_  
\_\_\_\_\_

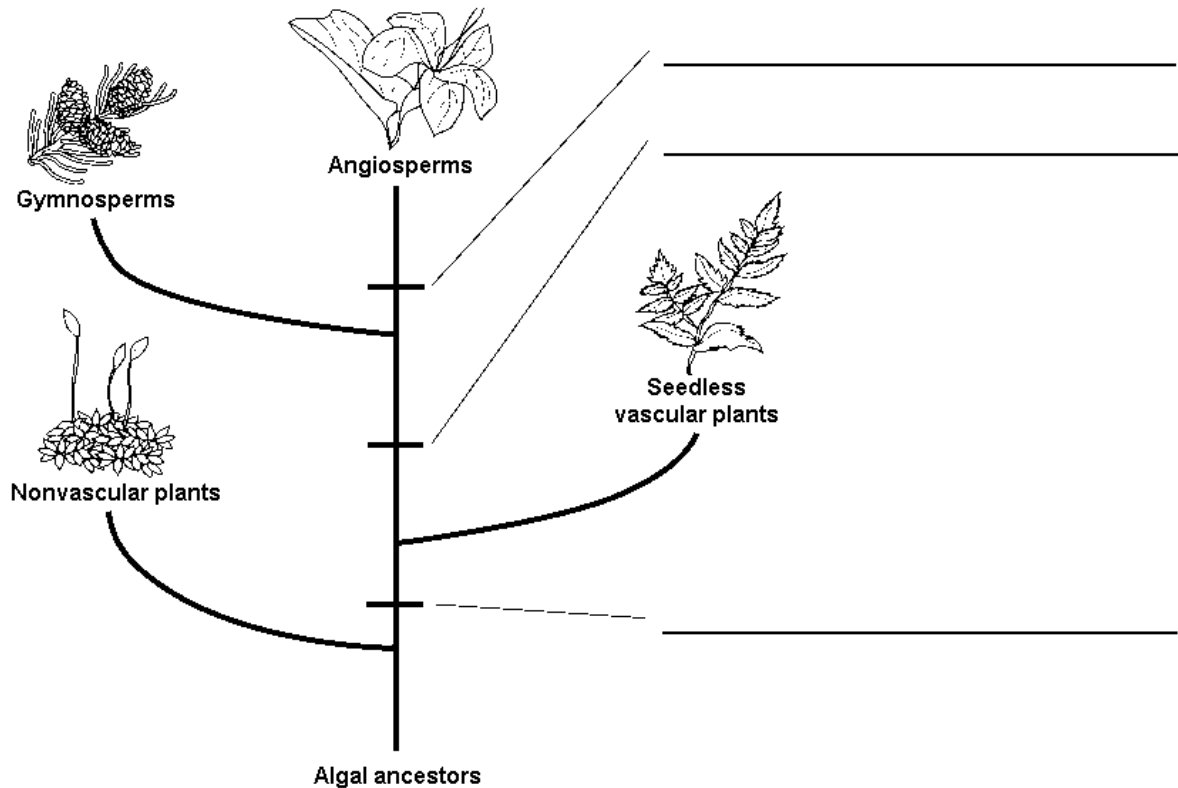
**MULTIPLE CHOICE Write the correct letter in the blank.**

- \_\_\_\_\_ 1. Which of the following is not a characteristic of plants?
  - a. eukaryotic
  - b. multicellular
  - c. cell walls containing chitin
  - d. contain chlorophyll
- \_\_\_\_\_ 2. The two types of reproductive cells produced by plants are
  - a. epidermal and bark.
  - b. parenchyma and collenchyma.
  - c. xylem and phloem.
  - d. gametes and spores.
- \_\_\_\_\_ 3. The first plants are thought to have evolved from
  - a. brown algae.
  - b. golden algae.
  - c. red algae.
  - d. green algae.
- \_\_\_\_\_ 4. Without gas exchange, a plant would be unable to
  - a. make food.
  - b. absorb sunlight.
  - c. make minerals.
  - d. produce water.
- \_\_\_\_\_ 5. Living on land required plants to
  - a. evolve photosynthetic pigments.
  - b. exchange gases for photosynthesis.
  - c. conserve water.
  - d. grow tall like trees.

**SHORT ANSWER** Answer the questions in the space provided.

1. Name three adaptations that plants have made to life on land. (p.554) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. Describe three similarities between modern green algae and plants. (pp.553-554) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
3. How are the gametophyte and sporophyte phases different from each other? (p.552) \_\_\_\_\_  
 \_\_\_\_\_
4. How were early plants similar to today's mosses? (p.554) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**STRUCTURES AND FUNCTIONS** The diagram below is a phylogenetic tree of plants and their algal ancestors. In the spaces provided, name the important adaptation(s) that each evolved at each of the positions indicated on the phylogenetic tree. Use the following terms: produces fruits, vascular tissue present, and produces seeds. (p.554)



**SECTION 22-2 REVIEW**

**BRYOPHYTES**

**VOCABULARY REVIEW Define the following terms.**

- 1. **bryophyte** \_\_\_\_\_  
\_\_\_\_\_
- 2. **rhizoid** \_\_\_\_\_  
\_\_\_\_\_
- 3. **gemma** \_\_\_\_\_  
\_\_\_\_\_
- 4. **protonema** \_\_\_\_\_  
\_\_\_\_\_

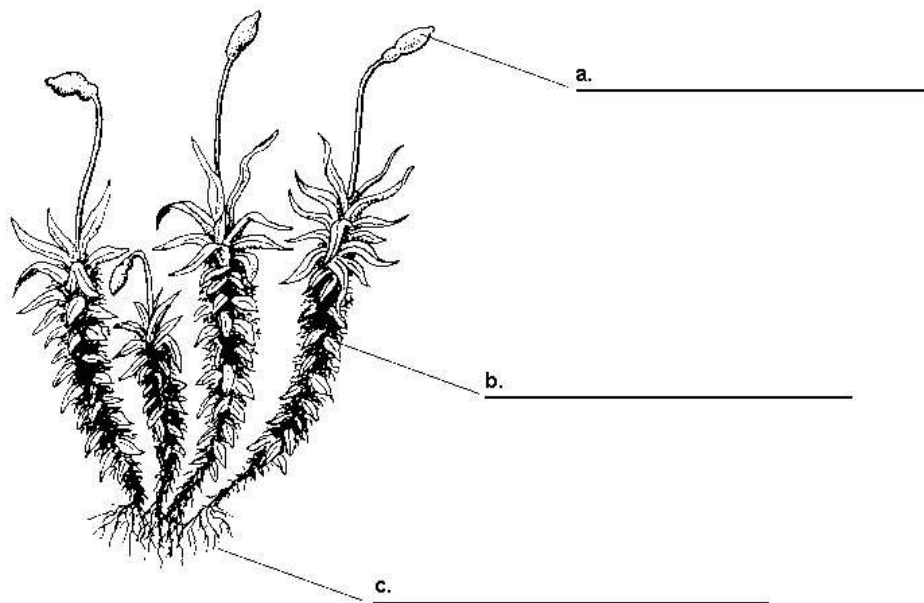
**MULTIPLE CHOICE Write the correct letter in the blank.**

- \_\_\_\_\_ 1. Bryophytes have
  - a. true roots, stems, and leaves.
  - b. a dominant gametophyte stage.
  - c. vascular tissue.
  - d. seeds.
- \_\_\_\_\_ 2. Bryophytes include all of the following plants except
  - a. ferns.
  - b. hornworts.
  - c. liverworts.
  - d. mosses.
- \_\_\_\_\_ 3. Mosses are the most abundant plant living in the
  - a. polar regions.
  - b. desert regions of Africa.
  - c. tropical rain forest.
  - d. grasslands of northern Europe.
- \_\_\_\_\_ 4. Bryophytes are small in size and are always found in damp or moist environments because they lack
  - a. chlorophyll a and b for photosynthesis.
  - b. vascular tissue for conducting water and minerals.
  - c. a process for transporting cellulose which is called active transport.
  - d. cell walls made of cellulose.
- \_\_\_\_\_ 5. In liverworts, the structures that produce eggs and sperm look like
  - a. a fern leaf called a frond.
  - b. tiny, green umbrellas.
  - c. the shape of a human liver.
  - d. a slender, green horn.

**SHORT ANSWER** Answer the questions in the space provided.

1. What is the difference between a true root and a rhizoid? Which do moss have? (p.557) \_\_\_\_\_  
\_\_\_\_\_
2. Why do bryophytes require a moist environment for sexual reproduction? (p.558) \_\_\_\_\_  
\_\_\_\_\_
3. Describe two ways that humans use sphagnum moss. (p.559) \_\_\_\_\_  
\_\_\_\_\_
4. How did the bryophytes called liverworts get their name? (p.557) \_\_\_\_\_  
\_\_\_\_\_
5. Why can't the bryophytes grow taller than your fist? (p.556) \_\_\_\_\_  
\_\_\_\_\_
6. In what way are antheridia different from archegonia? (p.559) \_\_\_\_\_  
\_\_\_\_\_

**STRUCTURES AND FUNCTIONS** The drawing below illustrates the main parts of a moss. Identify the phases of the moss life cycle represented by *a* and *b*, and name the structure labeled *c*. Use the following terms: gametophyte, rhizoids, and sporophyte. (p.557)



**SECTION 22-3 REVIEW**

**SEEDLESS VASCULAR PLANTS**

**VOCABULARY REVIEW** Distinguish between the terms in each of the following pairs of terms.

- 1. **xylem, phloem** \_\_\_\_\_  
\_\_\_\_\_
- 2. **rhizoid, root** \_\_\_\_\_  
\_\_\_\_\_
- 3. **vascular plant, nonvascular plant** \_\_\_\_\_  
\_\_\_\_\_
- 4. **rhizome, stem** \_\_\_\_\_  
\_\_\_\_\_

**MULTIPLE CHOICE** Write the correct letter in the blank.

- \_\_\_\_\_ 1. Horsetail plants do not
  - a. have xylem tissue.
  - b. have phloem tissue.
  - c. produce seeds.
  - d. have roots.
- \_\_\_\_\_ 2. Which of the following structures in ferns is diploid?
  - a. gametophyte
  - b. sporophyte
  - c. egg
  - d. sperm
- \_\_\_\_\_ 3. Which of the following includes all of the other terms?
  - a. xylem
  - b. vascular tissue
  - c. tracheid
  - d. phloem
- \_\_\_\_\_ 4. Club mosses are
  - a. nonvascular plants.
  - b. seedless, vascular plants.
  - c. seed producing plants.
  - d. extinct, but once formed great forests.
- \_\_\_\_\_ 5. Which plants have abrasive stems containing silica crystals and were often called scouring rush?
  - a. ferns
  - b. mosses
  - c. horsetails
  - d. club mosses
- \_\_\_\_\_ 6. During the dominant stage of their life cycle, ferns are
  - a. visible as haploid sporophytes.
  - b. visible as haploid gametophytes.
  - c. visible as diploid sporophytes.
  - d. visible as diploid gametophytes.

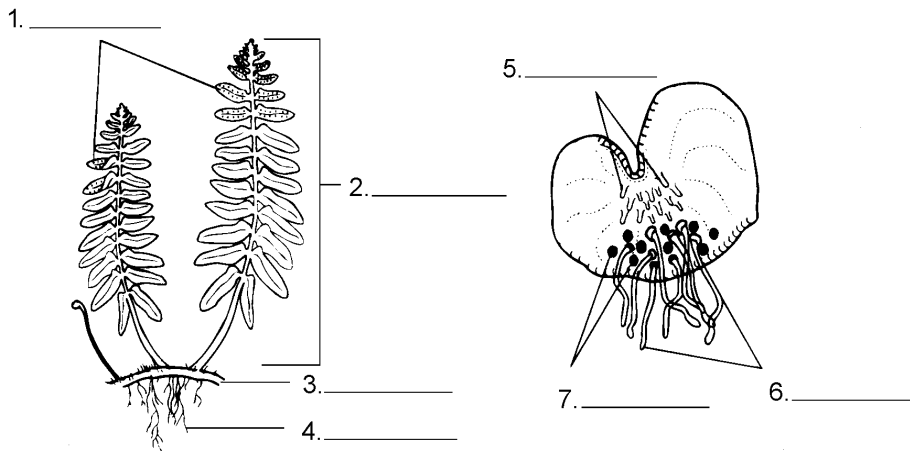
**SHORT ANSWER Answer the questions in the space provided.**

1. Identify two ways that vascular plants differ from nonvascular plants. (p.560) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. What can you infer about the needs of ferns from the fact that they thrive on the floors of thick forests? (p.562)  
 \_\_\_\_\_  
 \_\_\_\_\_
3. What does lignin help the plants do? (p.560) \_\_\_\_\_  
 \_\_\_\_\_
4. What are rhizomes? (p.562) \_\_\_\_\_  
 \_\_\_\_\_
5. Where are the antheridia and archegonia found in ferns? (p.562) \_\_\_\_\_
6. Why does fertilization in ferns require at least a thin film of water? (p.562) \_\_\_\_\_

**STRUCTURES AND FUNCTIONS** Use the following terms to label the diagrams of the stages in a fern's life cycle: antheridia, archegonia, frond, rhizoid, rhizome, root, and sporangium. (p.563)

**Sporophyte Generation**

**Gametophyte Generation**



8. How do structures 5 and 7 differ in their function? \_\_\_\_\_  
 \_\_\_\_\_

**SECTION 22-4 REVIEW**

**SEED PLANTS**

**VOCABULARY REVIEW Define the following terms.**

- 1. **gymnosperm** \_\_\_\_\_  
\_\_\_\_\_
- 2. **angiosperm** \_\_\_\_\_  
\_\_\_\_\_
- 3. **seed** \_\_\_\_\_  
\_\_\_\_\_
- 4. **pollen grain** \_\_\_\_\_  
\_\_\_\_\_
- 5. **embryo** \_\_\_\_\_  
\_\_\_\_\_

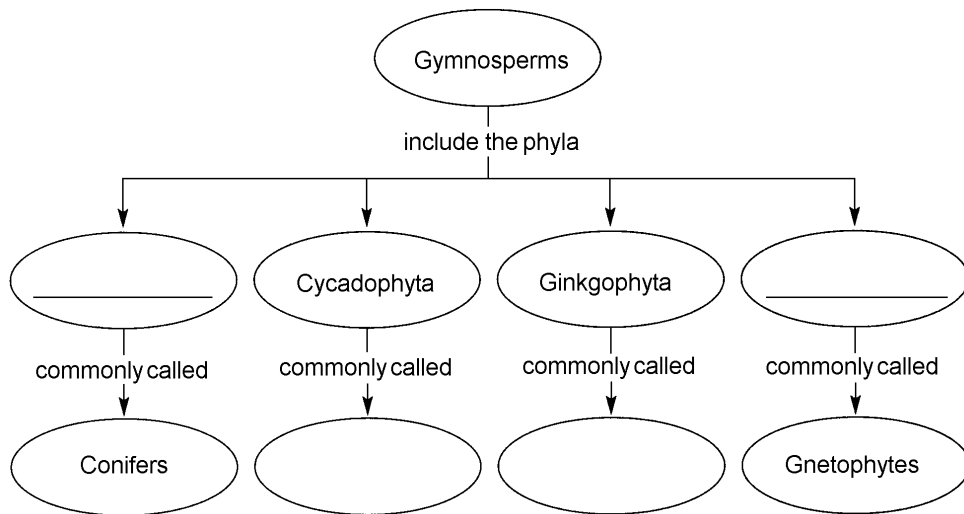
**MULTIPLE CHOICE Write the correct letter in the blank.**

- \_\_\_\_\_ 1. Each of the following is part of a seed except the  
a. embryo.                      b. stored food.                      c. seed coat.                      d. gametophyte.
- \_\_\_\_\_ 2. Pine trees are a type of  
a. nonvascular plant.                      b. angiosperm.                      c. gymnosperm.                      d. flowering plant.
- \_\_\_\_\_ 3. One of the adaptive advantages of seeds is that seeds  
a. lack a tough outer coat.                      c. do not remain inactive for long periods of time.  
b. can germinate without water.                      d. contain a nutrient supply.
- \_\_\_\_\_ 4. What type of seed plant bears its seeds directly on the surface of cones?  
a. a bryophyte                      b. a gymnosperm                      c. an angiosperm                      d. a pterophyte
- \_\_\_\_\_ 5. Seed bearing plants differ from all other plants in that  
a. they have vascular tissue consisting of xylem and phloem.  
b. they do not have a gametophyte generation.  
c. their gametes do not require water for fertilization to occur.  
d. All of the above are correct.

**SHORT ANSWER** Answer the questions in the space provided.

1. What are cones and flowers? (p.564) \_\_\_\_\_  
\_\_\_\_\_
2. What is pollination? (p.565) \_\_\_\_\_  
\_\_\_\_\_
3. What is the strategy that allows seeds to survive long periods of bitter cold, extreme heat, or drought? (p.565)  
\_\_\_\_\_  
\_\_\_\_\_
4. Why is the ginkgo tree sometimes called a living fossil? (p.567) \_\_\_\_\_  
\_\_\_\_\_
5. Why are the leaves of most conifers long and thin? (p.568) \_\_\_\_\_  
\_\_\_\_\_
6. How are larch and baldcypress trees different from other conifers? (p.568) \_\_\_\_\_  
\_\_\_\_\_

**STRUCTURES AND FUNCTIONS** Complete the concept map below about gymnosperms. (pp.566-567)





**SECTION 22-5 REVIEW**

**ANGIOSPERMS - FLOWERING PLANTS**

**VOCABULARY REVIEW** Define the following terms.

- 1. **fruit** \_\_\_\_\_  
\_\_\_\_\_
- 2. **cotyledon** \_\_\_\_\_  
\_\_\_\_\_
- 3. **dicot** \_\_\_\_\_  
\_\_\_\_\_
- 4. **monocot** \_\_\_\_\_  
\_\_\_\_\_
- 5. **perennial** \_\_\_\_\_  
\_\_\_\_\_

**MULTIPLE CHOICE** Write the correct letter in the blank.

- \_\_\_\_\_ 1. Most monocots
  - a. bear their seeds in cones.
  - b. lack vascular bundles.
  - c. do not produce flowers.
  - d. have parallel venation.
- \_\_\_\_\_ 2. A plant that has a life cycle that lasts for two years is a
  - a. dicot.
  - b. monocot.
  - c. biennial.
  - d. perennial.
- \_\_\_\_\_ 3. In angiosperms, the mature seed is surrounded by a
  - a. cone.
  - b. flower.
  - c. fruit.
  - d. cotyledon.
- \_\_\_\_\_ 4. Which term below is least closely related to the others?
  - a. fruit
  - b. seed
  - c. ovary
  - d. leaf
- \_\_\_\_\_ 5. The number of seed leaves (cotyledons) distinguishes
  - a. club mosses from true mosses.
  - b. the two classes of angiosperms.
  - c. angiosperms from gymnosperms.
  - d. seed plants from seedless plants.

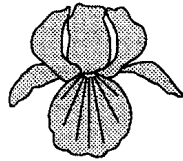
**SHORT ANSWER Answer the questions in the space provided.**

- How do the reproductive structures of angiosperms differ from those of other plants? (p.569) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- How do herbaceous plants differ from woody plants? (p.571) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- Describe the life cycle of an annual, a biennial, and a perennial. (p.572) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- What is the evolutionary advantage that flowers have over other plants? (p.569) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

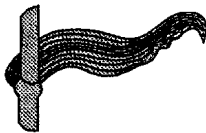
**STRUCTURES AND FUNCTIONS** Use the diagram and table to answer the following questions. (p.570)



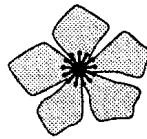
Maple



Iris



Corn



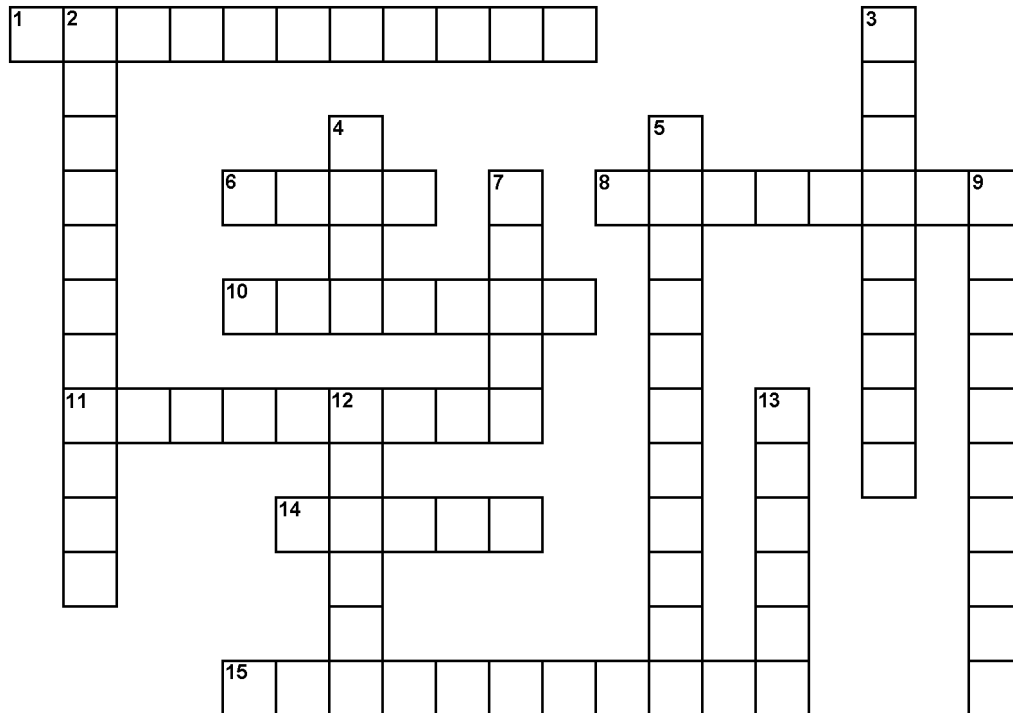
Periwinkle

	Monocots	Dicots
Leaves	Parallel veins	Branching veins
Flowers	Multiples of three	Multiples of four or five
Vascular bundles	Scattered	Arranged in a ring
Roots	Fibrous	Taproot
Seeds	One seed leaf	Two seed leaves

- A corn seed is a monocot. According to the table, does a corn seed have one or two seed leaves? \_\_\_\_\_
- Is the maple leaf a monocot or dicot? \_\_\_\_\_ How do you know? \_\_\_\_\_
- How are the vascular bundles in a corn plant arranged? \_\_\_\_\_
- Which flower is a monocot? \_\_\_\_\_
- A bean plant is a dicot. What type of root will it grow? \_\_\_\_\_

## VOCABULARY - CHAPTER 22

The crossword puzzle is a simple way to master some of the more important vocabulary terms in this chapter.



**Across**

1. the haploid generation in plants that produces gametes by mitosis
6. a reproductive structure with a plant embryo inside a protective coat; produced by gymnosperms and angiosperms only
8. plants that have a parallel venation pattern, flower parts in multiples of 3s, and one cotyledon
10. waxy covering on plant surfaces
11. the stored food that is inside some seeds
14. green \_\_\_\_\_ is considered to be the ancestor of the plant kingdom
15. cone bearing plants

**Down**

2. flowering plants
3. a common name for all nonvascular plants like moss liverworts and hornworts
4. sphagnum moss may become \_\_\_\_\_ moss and sold as a soil additive or burned as a fuel
5. \_\_\_\_\_ plants, like moss, hornwort, and liverwort, cannot grow tall because they lack the ability to move substances efficiently through their bodies
7. vascular tissue that transports water and minerals
9. the diploid generation in plants that produces spores by meiosis
12. vascular tissue that transports sugar and other organic compounds
13. plants that have a net venation pattern, flower parts in multiples of 4s and 5s, and two cotyledons

The following terms are **not** in this chapter but are found in this puzzle. Use a reference book and look up their meaning. **cuticle, endosperm, peat, and nonvascular.**