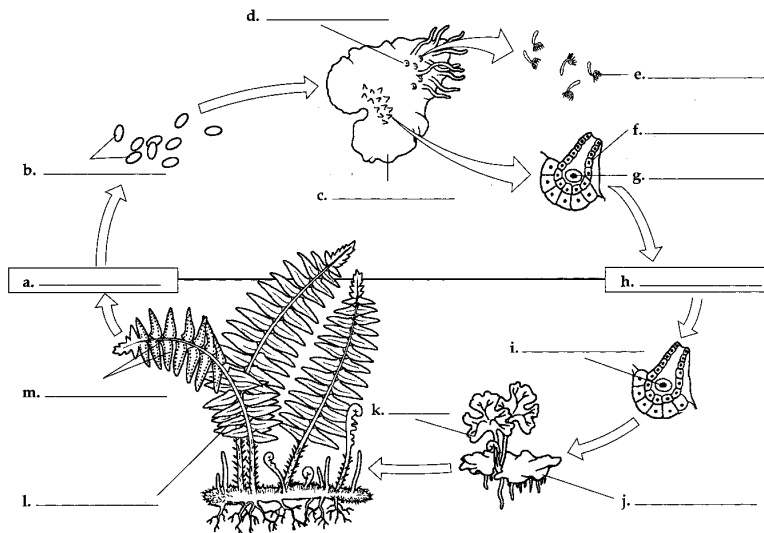


IQ

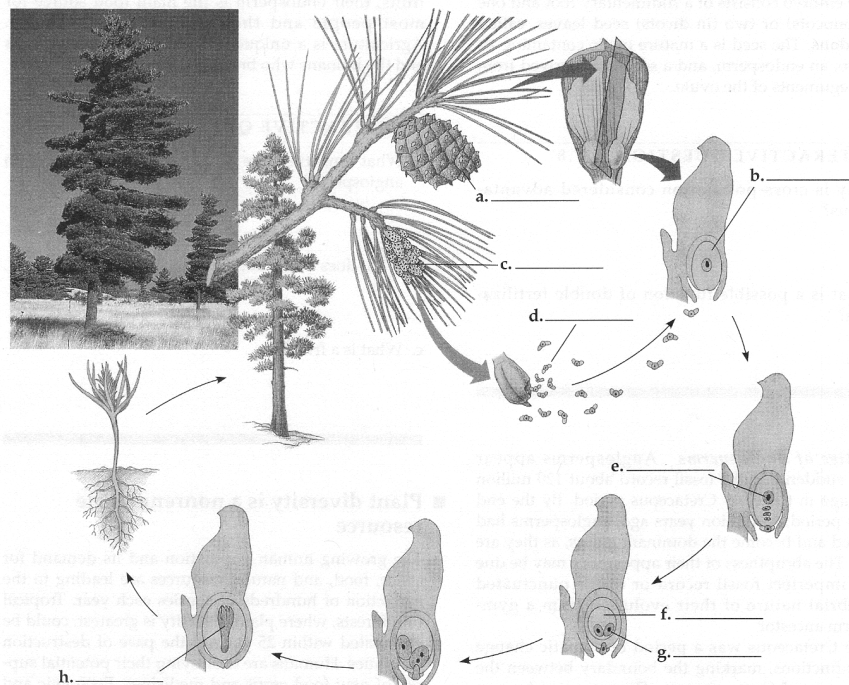
- List the 10 major characteristics of plants.
- How might alternation of generations have originated in the ancestor of plants?
- Review the life cycle of a typical mss plant by filling in the following blanks.

The dominant generation is the \_\_\_\_\_. Female gametophytes produce eggs in \_\_\_\_\_. Male gametophytes produce sperm in \_\_\_\_\_. Sperm \_\_\_\_\_ through the damp environment to fertilize the egg. The zygote remains in the archegonium and grows into the \_\_\_\_\_ still attached to the female gametophyte. Spores are formed by the process of \_\_\_\_\_ in the \_\_\_\_\_. When shed, spores develop into the \_\_\_\_\_.

- What is the structure and function of xylem?
- What is the structure and function of phloem?
- In the following diagram of a fern life cycle, label the processes (in the boxes) and structures (on the lines). Indicate which portion of the life cycle is haploid and which is diploid.



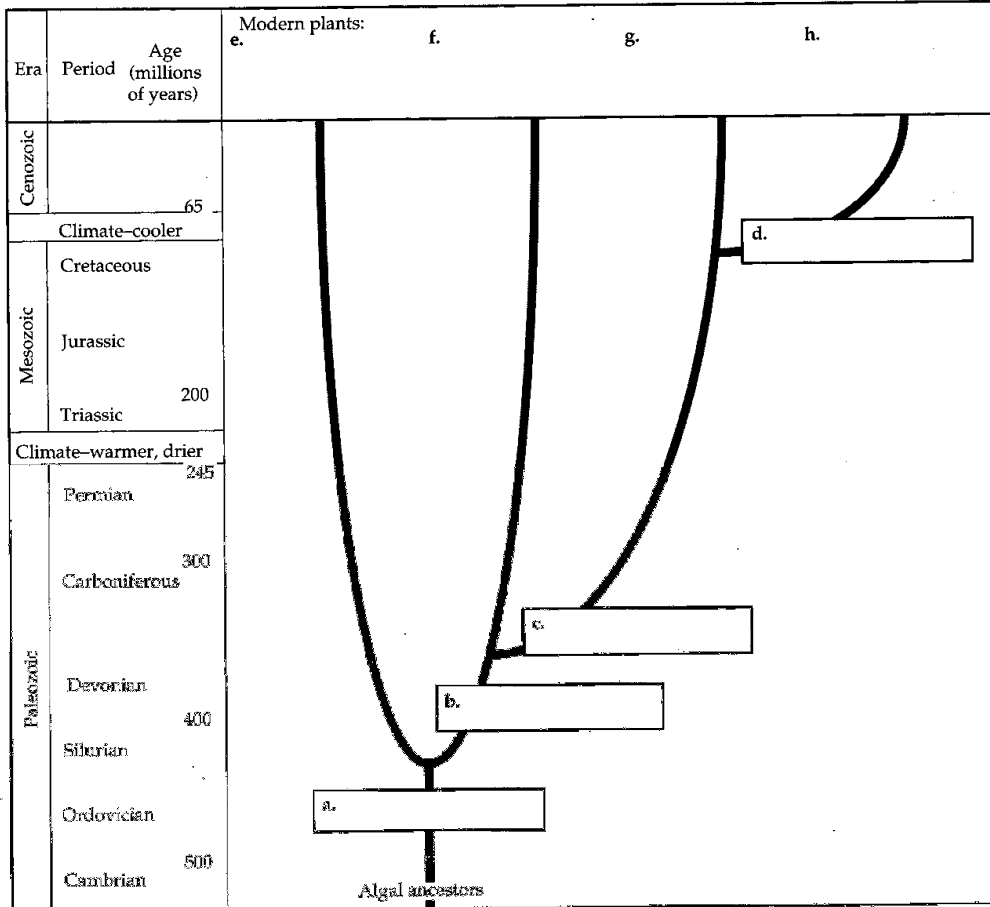
- What advantage would come from having the diploid sporophyte as the dominant generation?
- What advantage would come from retaining the gametophyte generation in the life cycle?
- In the diagram of the life cycle of a pine, label the indicated structures and show where meiosis, pollination, and fertilization take place. Which structures represent the gametophyte generation?



10. Why is cross-pollination considered advantageous?
11. What is a possible function of double fertilization?
12. What constitutes the gametophyte generation of an angiosperm?
13. What does a seed consist of?
14. What is a fruit?

SYJ

15. Fill in the evolutionary events and modern plant groups (include some common name examples) on this phylogenetic tree that shows the major lines of plant evolution on a geological time frame. Indicate the periods of dominance for the major groups. What was the impact of the major climatic changes that occurred between the Paleozoic, Mesozoic, and Cenozoic eras?



16. The evolution of plants shows a trend of increasing adaptation to a terrestrial habitat. List the characteristics that were novel adaptations for the following major plant groups.

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

1) The term living fossil is sometimes used to describe a living member of a mostly extinct group. An example of a living fossil in the plant kingdom would be a \_\_\_\_\_ 1) \_\_\_\_\_

- A) moss.
- B) sunflower.
- C) bristle-cone pine.
- D) horsetail.
- E) wind-pollinated angiosperm.

2) In flowering plants, meiosis occurs specifically in the \_\_\_\_\_ 2) \_\_\_\_\_

- A) megaspore mother cells.
- B) microspore mother cells.
- C) endosperm.
- D) Only a and b are correct.
- E) a, b, and c are correct.

3) Of the following list, flagellated (swimming) sperm are present in which groups? \_\_\_\_\_ 3) \_\_\_\_\_

1. Lycophyta
2. Bryophyta
3. Angiospermae
4. Chlorophyta
5. Pterophyta

- A) 2, 3, 5      B) 1, 2, 4, 5      C) 2, 3, 4, 5      D) 1, 2, 3      E) 1, 3, 4, 5

The following four questions refer to the generalized life cycle for plants shown in Figure 27.1. Each number within a circle or square represents a specific plant or plant part, and each number over an arrow represents either meiosis, mitosis, or fertilization.

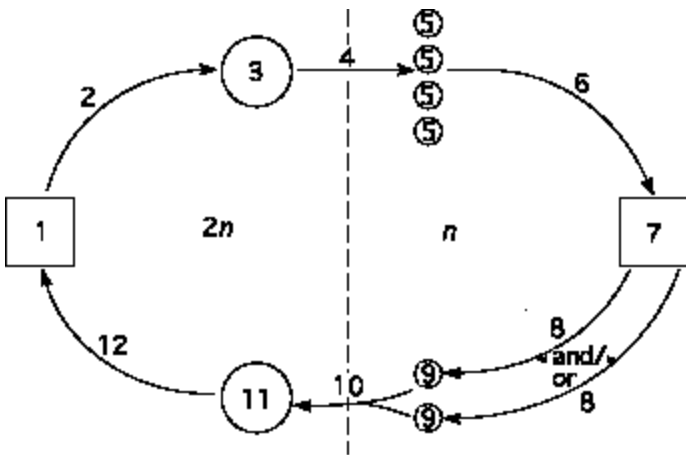


Figure 27.1

4) Which number is a megaspore mother cell? \_\_\_\_\_ 4) \_\_\_\_\_

- A) 5      B) 7      C) 3      D) 11      E) 1

- 5) In ferns, what does the spore become? 5) \_\_\_\_\_
- A) gametophyte
  - B) sporophyte
  - C) rhizome
  - D) sporangium
  - E) fiddlehead
- 6) A number of characteristics are very similar between the Charophyta green algae and the kingdom Plantae. Of the following, which characteristic does NOT provide evidence for an evolutionarily close relationship between these two groups? 6) \_\_\_\_\_
- A) chloroplast structure
  - B) ribosomal RNA base sequences
  - C) sperm cell structure
  - D) alternation of generations
  - E) cell plate formation during cytokinesis
- 7) Along with the seed, the seed plants have evolved several additional adaptations to the land environment. Which one of the following is NOT such an adaptation? 7) \_\_\_\_\_
- A) The seed contains nutrients for the enclosed embryo.
  - B) Flagellated gametes are not required for seed formation.
  - C) The female gametophyte is protected from dessication by the surrounding tissues of the sporophyte.
  - D) Seed formation introduces a new type of genetic recombination.
  - E) The seed and/or associated structures serve as a means of dispersal.
- 8) In addition to seeds, which of the following characteristics are unique to the seed-producing land plants? 8) \_\_\_\_\_
- A) a haploid gametophyte retained within tissues of the diploid sporophyte
  - B) lignin present in cell walls
  - C) pollen
  - D) Only a and c are correct.
  - E) a, b, and c are correct.
- 9) What is one reason why the Chlorophyta are believed to be the ancestors of plants? 9) \_\_\_\_\_
- A) They are the only multicellular algal protists.
  - B) They do not have flagellated gametes.
  - C) They exhibit an alternation of generations.
  - D) Some of their members have developed holdfast, stipe, and blades – ancestral to root, stem, and leaves.
  - E) They have similar chloroplasts and pigment composition.

- 10) Agricultural modifications of plants have progressed to the point that a number of cultivated plant species probably could not survive in the wild. Why is this so? 10) \_\_\_\_\_
- A) Special conditions not found in nature are needed for their growth and reproduction.
  - B) Environmental conditions have changed since the plants evolved.
  - C) Cultivated plants are more vulnerable to human-caused pollution and disasters.
  - D) Their seeds cannot be dispersed without agricultural machinery.
  - E) Seeds can be obtained only from seed banks in agricultural countries.