

Feature	Plant Group						
	Bryophytes	Lycophytes	Pterophytes	Gymnosperms	Angiosperms	Charophyceans (green algae)	
Peroxisomes	Yes	Yes	Yes	Yes	Yes	Yes	
Chlorophylls <i>a</i> and <i>b</i>	Yes	Yes	Yes	Yes	Yes	Yes	
Jacketed gametangia	Yes	Yes	Yes	Yes	Yes	No	
Cuticle							
Stomata							
Vascular tissue							
Stems containing vascular tissue							
Roots or rhizomes							
True leaves (contain vascular tissue)							
Antheridia							
Archegonia							
Flagellate sperm							

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	Bryophytes	Lycophytes	Pterophytes	Gymnosperms	Angiosperms	Charophyceans (green algae)
Pollen						
Seed						
Flower						
Fruit						
Gametophyte dominant						
Sporophyte dominant						
Sporophyte dependent on gametophyte for energy						
Sporophyte and gametophyte both independent						
Gametophyte dependent on sporophyte						

Use the information in the chart you have completed to answer the questions.

- Some of the major plant groups are listed in the following table from most primitive to most advanced. For each group, indicate what major characteristics make it more advanced than the preceding group. For example, how are ferns more advanced than mosses?

	Plant group					
	Charophyceans	Bryophytes	Lycophytes	Pterophytes	Gymnosperms	Angiosperms
Advance(s) over preceding group						

- How do the bryophytes differ from the seedless vascular plants? How are they similar?

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3. The life cycle of all land plants includes an alternation of generations between a multicellular gametophyte phase and a multicellular sporophyte phase.

Diagram the life cycle of a seed plant.

- a. What cellular division process always precedes formation of the gametophyte generation?
- b. What cellular process always precedes formation of the sporophyte generation?
- c. If the sexual generation gives rise to the gametes, what part of an angiosperm is sexual?
- d. If the sexual generation gives rise to the gametes, what part of a bryophyte moss is sexual?

4. Until the evolution of the seed plants, land plants were dependent on the availability of water for reproduction. Explain why this was true. Explain how seed plants overcame the need for water in reproduction.

5. Pollen, seeds, flowers, and fruits are considered among the most advanced characteristics in the plant kingdom. What evolutionary advantage(s) does each of these offer (relative to what existed before)?