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Date _____ Professor/TA _____

Activity 29/30.2 What can a study of extant species tell us about the evolution of form and function in the plant kingdom?

Fill in the chart on the next pages to compare the major features of key groups of land plants with one another and with the charophyceans.

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Feature	Plant group					
	Bryophytes	Lycophytes	Pterophytes	Gymnosperms	Angiosperms	Charophyceans (green algae)
Peroxisomes	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Chlorophylls *a* and *b*	*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						
Flagellated sperm						

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Feature	Plant group					
	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						

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Use the information in the chart to answer the questions.

1. Some of the major plant groups are listed in the following chart 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						

2. 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 division 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?

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