Biology Chapter 21Student Notes

**Plant Evolution and Adaptations**

When scientists compare present-day plants and present-day green algae, they find the following common characteristics:

* + cell walls composed of cellulose
  + cell division that includes the formation of a cell plate
  + the same type of chlorophyll used in photosynthesis
  + similar genes for ribosomal RNA
  + food stored as starch
  + the same types of enzymes in cellular vesicles

Cuticle

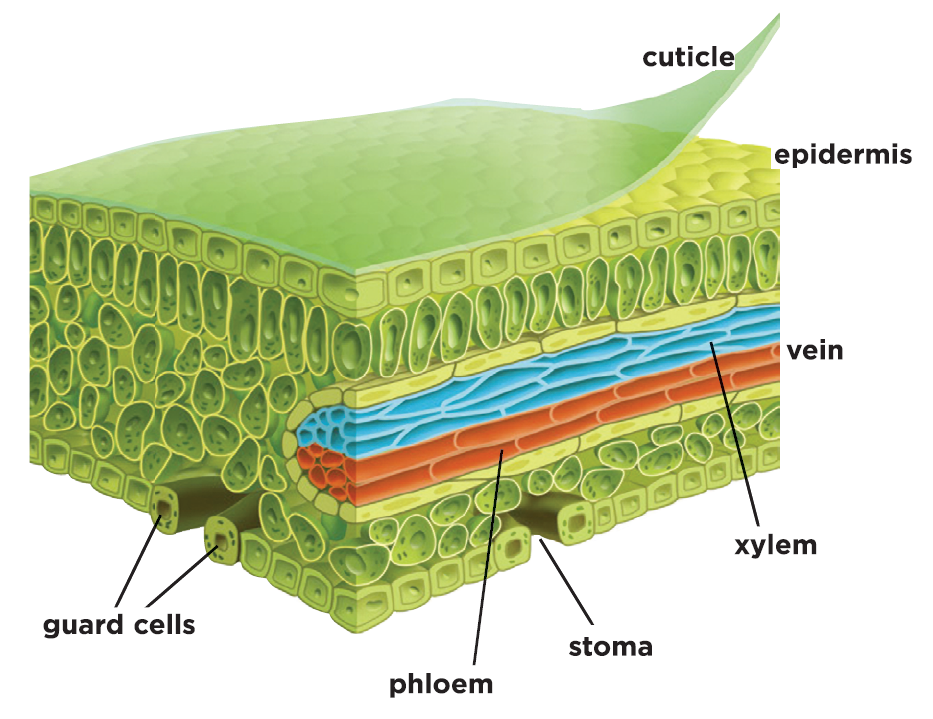
* Helps prevent the evaporation of water from plant tissues
* Acts as a barrier to invading microorganisms

Epidermis – skin of plant under the cuticle

Vein: contains xylem and phloem

Stoma – pore / holes that exchange oxygen and carbon dioxide

Guard cells – open and close the stoma



Stomata

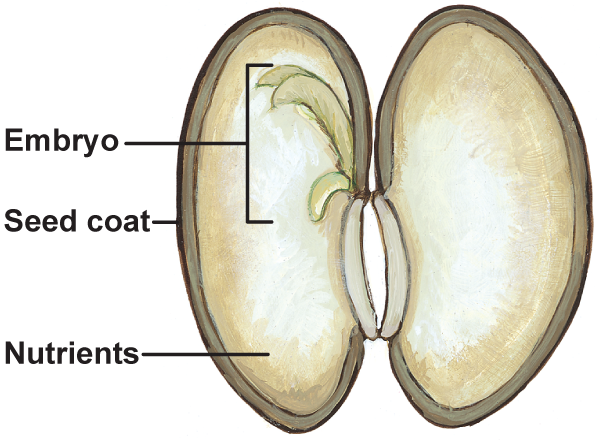
* Adaptations that enable the exchange of gases even with the presence of a cuticle on a plant
* Openings in the outer cell layer of leaves and some stems

Vascular Tissues

* Vascular tissue enables faster movement of substances than by osmosis and diffusion, and over greater distances.
* Vascular tissue provides support and structure, so vascular plants can grow larger than nonvascular plants.

Seeds

* A plant structure that contains an embryo ( baby plant), contains nutrients for the embryo, and is covered with a protective coat called a seed coat.
* These features enable seeds to survive harsh environmental conditions and then sprout when favorable conditions exist.



Alternation of Generations

* Gametophyte generation produces gametes.
* Sporophyte generation produces spores that can grow to form the next gametophyte generation.
* During plant evolution, the trend was from dominant gametophytes to dominant sporophytes that contain vascular tissue.

Plant Categories

* Nonvascular
  + Ex: Liverworts, mosses, hornworts
* Vascular
  + Seed plants
    - Conifers, cycads, ginkgoes
  + Nonseed plants
    - Ferns
    - Horsetails
    - Club mosses