AP Biology 12
Plant Form and Function

Nam
Date
Bloc

Key: Thanks to a student in AP 12, 2011

Concept 1: Analyzing the structure, growth, development and nutrition of plants (Ch 35, 37)

There are many new terms in this concept. The purpose of this handout is to organize and apply the language of plants!

1. Complete the following table:

System	Structure	Primary Function	Example of Adaptations
Root System	Roots	- anchors the plant, absorbs water and minerals, stores sugars and starches	- tiny root hairs to increase surface area to absorb water and minerals
Shoot System	Stem	- hold the leaves to display them to the light	- different components for added support
	Terminal bud	- prohibits growth of axillary buds to direct the plant growth upward	- adapted to increase chance for more photosynthesis
	Axillary bud	- have the potential to form a branch (structural support for the leaves)	- can increase support
	Leaves	- primary area for photosynthesis	- vary in size depending on location to maximize photosynthesis

2. Complete the following table:

Tissue	Description of Structure	Description of Function	Example
Dermal Tissue	- single layer of dense cells, covering entire plant	protect against water loss	- epidermis
Vascular Tissue – Xylem	- Internal tube like tube	- transports water and minerals up from roots	Angiosperms have central vascular cylinder
Vascular Tissue– Ploem	- Another internal tube	- transports food from leaves else where in the plant	Stems and leaves have vascular bundles with separated xylem + phloem
Ground Tissue	- varies in location, any tissue not dermal or vascular	- storage, photosynthesis, support	internal to vascular = pith external to vascular = cortex

stele

3. Complete the following table:

Cell Type	Structure and Location	Function
Parenchyma Cells	- walls thin + flexible (mostly only one wall) large central vacuole - in leaves, stems, roots	- perform metabolic functions i.e photosynthesis
Collenchyma Cells	- grouped in strands or cylinders - thick primary walls, uneven - lack secondary walls	- support young parts of shoot
Sclerenchyma Cells Sclereids, fibers	- thick secondary walls present - in regions which have stopped growth	- support
Xylem Cells - tracheids	- tubular, elongated, thin cells, lignified - in xylem	- transport of water
Xylem Cells - vessels	- wider, shorter, thinner walled, less tapered than tracheids	- transport of water
Phloem Cells - sieve-tubes	- no nucleus, ribosomes, organelles reduced, cytoskeleton - pores, made of chains	- nutrient transport
Phloem Cells - companion	- non-conducting cell next to sieve-tube with nucleus and ribosome	- nutrient transport

dead at maturity

alive @ maturity

4. Compare and contrast annuals, biennials and perennials.
   Annuals - life cycle completed in one year
   perennial - Life cycle occurs for many years
   biennials - Life cycle lasts for 2 years

5. Define **meristem**.
   Tissues which are perpetually embryonic so that plant growth becomes indeterminate. Growth occurs as a result of cell division in meristem tissue.

6. Compare and contrast primary growth (with apical meristems) and secondary growth (with lateral meristems).
   Primary growth allows plant to grow in length so that roots extend and shoots lengthen. Apical meristems provide cells for primary Secondary growth increases thickness of a plant and is caused by activity in lateral meristems

7. List all of the macronutrients and micronutrients that a plant requires to complete its life cycle.
   Macro - Carbon, Oxygen, hydrogen, nitrogen, potassium, calcium, magnesium
   Micro - chlorine, iron, manganese, boron, zinc, copper, nickel, molybdenum

8. Explain the difference between a macronutrient and a micronutrient.
   Macronutrients - required in relatively large amounts
   Micronutrients - necessary in tiny quantities

9. Define **rhizosphere**.
   The soil layer that is bound to the plant's roots.

10. Complete the following chart:

Organism in Mutually Symbiotic Relationship with plants	Description of relationship - What does the plant get? What does the other organism get?
Rhizobacteria	- plant's photosynthetic production fuels these organisms - plant growth is enhanced or roots are protected
Rhizobium	- fix atmospheric nitrogen for plant use - plant provides food into root nodule for bacteria
Mycorrhizae	- plant provides sugar to the fungus - fungus increases surface area for water uptake

11. Complete the following chart

Plant	Description	Example
Parasitic plants	Rely on other plants for nutrients; not photosynthetic	Mistletoe
Epiphytes	Not parasitic but grow on surfaces of other plants	Orchids
Carnivorous plants	photosynthetic, get nitrogen and other minerals by digesting small animals	venus - fly trap