

Generalized Concepts

Fungi

- why are they discussed with plants?
- what makes the Fungi a unique group; characteristics, features, lifestyle, lifecycle?

Algae/mosses

- The first plants; what makes something a plant; why?
- What makes them plants?
- Alternation of generations
 - what is Alternation of Generations
 - what is the sporophyte...describe its position/role in the lifecycle
 - what is the gametophyte...position/role in the lifecycle
- what are lichens?

Vascular plants

- what makes them vascular? From whence did they originate? What changes do they show over their evolutionary ancestors? Why were these changes favored?

Ferns/Gymnosperms

- What "advances" are shown by these groups? What was the evolutionary "force" leading to the success of these groups? Describe and understand the expression of Alternation of Generations in these groups.

Angiosperms

- What are they and how do they differ from earlier evolved plants? Where did they evolve from and what was the driving evolutionary force? What "advances" did they make? What is the status of Alternation of Generations in this group; specifically understand what has happened to the sporophyte and gametophyte?

Cells and tissues

- know general categories of cells making up the plant body; functions and distributions.

Roots

- what makes something a root? what features distinguish an organ as a root? which plants have roots? How does a root function... specifically understand the functioning of the endodermis and Casparian strip. What is a lateral root and where does it come from?

Shoots-primary structure

- what is primary growth and where does it come from? What tissues/cells are primary? What is the shoot apex/shoot meristem? Where is/are it located on a plant? How do we define the apex? What does it do? Where do leaves form and from what? Where do buds form and from what? What is a node? What is an internode?

Shoots, secondary structure/growth

- What is secondary structure/growth? Where does it come from? Which groups show it? How does it differ from primary growth? What does it result in?

What is an annual ring? How does it form? What information does it provide?

What is a knot hole. How does it arise?

What is the vascular cambium and how it forms? In which groups? ...in which organs?

Describe what cells make up the cambium. How does the cambium function...what does it make? What is an annual ring? What information can you "read" from an annual ring?

What is the cork cambium? How does it differ from the vascular cambium? Which groups have it? Which organs have it? How does it arise....in which tissues and how often? What does it form? What is the relationship of cork and secondary phloem?

SAMPLE QUESTIONS

1. All of the following are true of the Alternation of Generations cycle **except**
 - a. spores directly produce gametes
 - b. spores are haploid
 - c. gametes fuse to form a zygote
 - d. the gametophyte may or may not be free living
 - e. the sporophyte may or may not be free living
2. The process of double fertilization in the **gymnosperms** results in
 - a. the $2n$ zygote
 - b. the megagametophyte tissue
 - c. the seed coat
 - d. both a and b
 - e. double fertilization is not found in the gymnosperms
3. Orchid, monocots, produce very small seeds with a very poorly developed embryo. This means that
 - a. endosperm is never present
 - b. double fertilization likely did not occur
 - c. megagametophyte tissue still fills most of the seed
 - d. a seed coat is absent
 - e. none of the above seems reasonable.
4. When you look at a typical pine tree you are observing the
 - a. sporophyte generation
 - b. the gametophyte generation
 - c. the independent generation
 - d. both a and c are correct
 - e. both b and c are correct
5. The fungus *Pilobolus* discharges its spores towards the light (it is phototropic). Why?
 - a. this increases the chance for photosynthesis in the spore, helping it become established as a new organism.
 - b. this moves the spore away from the original dung where all nutrients are likely to be eventually exhausted.

- c. this increases the likelihood that herbivores such as cows will eat the fungus and transport it to a new place.
d. both "a" and "b" are likely.
e. both "b" and "c" are likely.
6. Which of the following would be examples of primary growth.
a. production of flowers
b. outgrowth of a bud
c. production of new leaves
d. a,b and c
e. only a and c
7. As a dicot tree trunk enlarges, the vascular cambium
a. moves further from the primary xylem
b. moves closer to the primary xylem
c. moves closer to the primary phloem
d. breaks up in to separate, discontinuous pieces
e. both a and d are correct
8. Angiosperms are believed to have evolved from a now extinct gymnosperm ancestor. Of the characteristics listed, which definitely were NOT shown by this **gymnosperm** ancestor?
a. alternation of generations
b. wind pollination
c. 3N megagametophyte tissue
d. possession of archegonia
e. presence of xylem
9. In the trunk of a very old gymnosperm tree all of the following tissues would be present EXCEPT:
a. primary xylem
b. primary phloem
c. pith
d. secondary xylem
e. all of the above will likely be present
10. Some angiosperms have reverted (re-evolved) to wind pollination. The advantages of this re-evolved mechanism for pollen dispersal include
a. fewer pollen grains need to be produced then when a plant is wind pollinated.
b. there is a greater chance of success of pollination with wind pollination compared to insect pollination.
c. wind pollination would be beneficial if insects died or were unavailable.
d. the wind-transported microspore is smaller than the insect-transported microspore and therefore more easily moved.
e. both a and c are possible.

11. Assume you found a tree in which the positions of the primary xylem and phloem were reversed relative to the center of the stem. The consequences of such a reversal would be;

- a. eventual loss of the primary xylem
- b. xylem on the top side of a leaf
- c. xylem on the bottom side of a leaf
- d. the largest vessels in an annual ring towards the outside of an individual annual ring
- e. a, c and d are all possible