Supplemental Test Items to accompany OpenStax College *Concepts of Biology*. Note that not all chapters of OpenStax College *Concepts of Biology* have accompanying test items. Building on the community-oriented nature of OpenStax College resources, we invite you to submit items to be considered for future inclusion.

**Chapter 14: Diversity of Plants**

1. Vascular plants have two main organ systems. What are they? (Outcome #6a) (DOK 1)
   1. stems and leaves
   2. roots and shoots\*
   3. roots and vasculatures
2. Plant tissue systems fall into two general categories. What are they? (Outcome #6a) (DOK 1)
   1. permanent and meristematic\*
   2. non-permanent and meristematic
   3. permanent and non-meristematic
3. To which of the two main pant organ systems do stems belong? (Outcome #6a) (DOK 1)
   1. roots
   2. dermal tissue
   3. shoots\*
4. Stems carry water through \_\_\_\_\_\_\_\_tissue and nutrients through \_\_\_\_\_\_\_\_\_tissue. (Outcome #6a) (DOK 1)
   1. xylem, phloem\*
   2. phloem, xylem
   3. veins, arteries
5. Root systems fall into two major categories:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (Outcome #Via) (DOK 1)
   1. bulb and tuber
   2. tap and fibrous\*
   3. monocot and dicot
6. The leaves of plants serve as the primary sites of what? (Outcome #6a) (DOK 1)
   1. reproduction
   2. growth
   3. photosynthesis\*
7. Which of the following is not usually part of a typical leaf? (Outcome #6a) (DOK 1)
   1. lamina
   2. midrib
   3. tendrils\*
8. The leaf stoma is the structure primarily responsible for the transport of what? (Outcome #6a) (DOK 1)
   1. carbon dioxide\*
   2. sugars
   3. sunlight
9. Annual growth rings in trees are the result of what? (Outcome #6a) (DOK 2)
   1. the cyclical growth and death of ground tissues in the phloem
   2. the seasonal variation in vascular cambium, consisting of the development of thin cell walls in secondary xylem in the spring and thicker cells walls in secondary xylem in the fall.\*
   3. the annual variation in rapid growth in the apical meristems that results in the thickening of the cork cambium layers.
10. The plant structure that consists of upper and lower epidermis and mesophyll consisting of two types of parenchyma is what? (Outcome #6a) (DOK 2)
    1. the root
    2. the stem
    3. the leaf\*
11. A single vascular bundle in a leaf consists of which tissues? (Outcome #6a) (DOK 2)
    1. both xylem and phloem\*
    2. xylem only
    3. phloem only
12. Scientists refer to the water potential of a plant in describing how water moves through a plant. Which of the following statements about the water potential is false? (Outcome #6a) (DOK 2)
    1. Water moves only when the water potential of the entire system is greater than or less than zero.
    2. Water moves only when the water potential of the entire system is equal to zero.\*
    3. Water moves in the plant as a result of changes in one or more variables including solute concentration, pressure, and matric potentials.
13. Streptophytes, Bryophytes, and Monilophytes are phyla within which general plant category? (Outcome #6a) (DOK 3)
    1. flowering gymnosperm plants
    2. spermatophyte plants
    3. homosporous seedless plants\*
14. A scientist traversing a remote wooded area discovers what he thinks is a new plant species. He makes observations of the plant, discovers that it produces a nut similar to an acorn, and concludes it is what type of plant? (Outcome #6a) (DOK 3) (Paired Item 1)
    1. Angiosperm\*
    2. Gymnosperm
    3. Ginkophyte
15. A scientist traversing a remote wooded area discovers what he thinks is a new plant species. He observes a variety of characteristics and concludes that the plant is an angiosperm. What is one possible supporting observation for this conclusion? (Outcome #6a) (DOK 3) (Paired Item 2)
    1. The plant produces nuts that are quite similar to maple tree seeds.\*
    2. The plant produces cones much like that of a pine tree.
    3. The plant produces spores and looks like a fern.
16. How would you test to see if organic nitrogen was required for optimal plant growth? (Outcome #6) (DOK 3)
    1. set up an experiment using different amounts of atmospheric nitrogen
    2. set up an experiment using different amounts of nitrogen fertilizer\*
    3. set up an experiment using different amounts of atmospheric carbon dixoide
17. Which of the following is the characteristic reproductive structure for angiosperm plants? (Outcome #6) (DOK 1)
    1. spore
    2. cone
    3. flower\*
18. The male gamete of a flowering plant is known as: (Outcome #6) (DOK 1)
    1. sperm
    2. pollen\*
    3. spores
19. How could you show experimentally that leaves are necessary for plant growth? (Outcome #6) (DOK 3) (Paired Item 1)
    1. Remove different numbers of leaves from plants in each test group, and measure their growth under the same conditions\*
    2. Expose groups of plants to different amounts of sunlight
    3. Test the effect of painting leaves of an experimental group with clear nail polish
20. How could you show experimentally that photosynthesis is important for plant growth? (Outcome #6) (DOK 3) (Paired Item 2)
    1. Remove different numbers of leaves from plants in each test group, and measure their growth under the same conditions
    2. Expose groups of plants to different amounts of sunlight\*
    3. Test the effect of painting leaves of an experimental group with clear nail polish
21. Which of the following is used by plants to transport sugars and amino acids? (Outcome #6) (DOK 1)
    1. roots
    2. xylem
    3. phloem\*
22. Which type of plant tissue has cells which actively divide throughout a plant’s lifetime? (Outcome #6) (DOK 1)
    1. meristematic\*
    2. permanent
    3. metaplastic