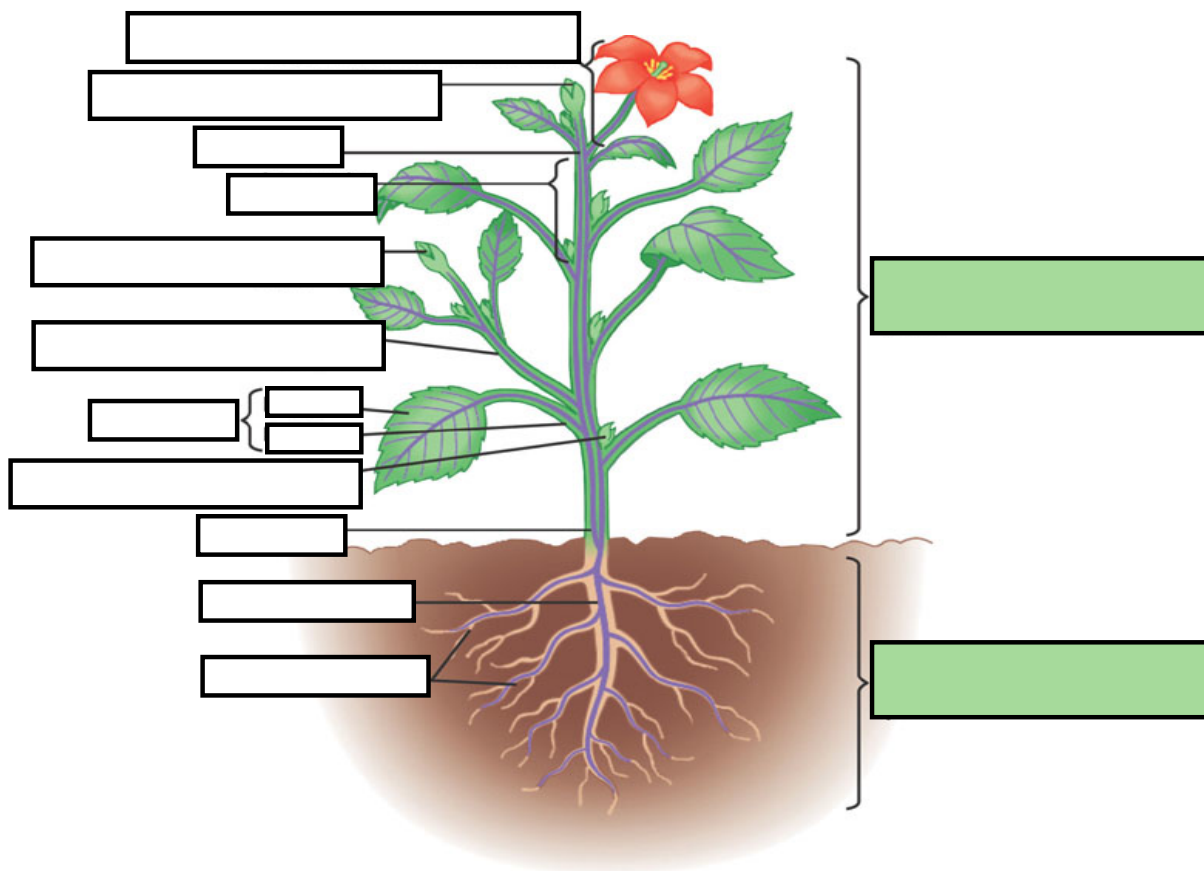


- Please print out these pages and **HANDWRITE** the answers directly on the printouts. Typed work or answers on separate sheets of paper will not be accepted.
- Importantly, guided readings are **NOT GROUP PROJECTS!!!** You, and you alone, are to answer the questions as you read. You are not to share them with another students or work together on filling it out. Please report any dishonest behavior to your instructor to be dealt with accordingly.
- Get in the habit of writing legibly, neatly, and in a **NORMAL, MEDIUM-SIZED FONT**. AP essay readers and I will skip grading anything that cannot be easily and quickly read so start perfect your handwriting.
- Please **SCAN** documents properly and upload them to Archie. Avoid taking photographs of or uploading dark, washed out, side ways, or upside down homework. Please use the scanner in the school's media lab if one is not at your disposal and keep completed guides organized in your binder to use as study and review tools.
- **READ FOR UNDERSTANDING** and not merely to complete an assignment. Though all the answers are in your textbook, you should try to put answers in your own words, maintaining accuracy and the proper use of terminology, rather than blindly copying the textbook whenever possible.

*"In this entire unit, the challenge for students will be to learn the new vocabulary. As we work through this unit, you will find an emphasis on labeling and explaining plant diagrams and specific directions what you should know." [2]*

**The Plant body has a hierarch of organs, tissues, and cells. [2]**

- This concept is organized into three sections—plant organs, tissues, and cells. Begin by defining a **tissue**. [2]
  - Next, define an **organ**. [2]
- The three plant organs are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. [2]
- On Figure below, label the **shoot system**, **root system**, and **anatomical parts** of a typical flowering plant. [2]



b. In what way does the shoot systems rely of the root system and vice versa?

4. a. What is a root?

b. Most gymnosperms and angiosperms have a taproot system. What is the difference between the taproot and the lateral roots in their positioning in the taproot systems and their possible functions.

c. Other plants have fibrous root systems. How does a fibrous root system differ physically from the taproot system?

d. What environmental conditions would have favored the evolution of fibrous root systems instead of taproot systems and vice versa in different plant species?

5. a. This photograph shows the root hairs of a radish. What is the function of root hairs?

b. How do they differ from lateral roots?



6. Some species of plants have modified roots. What are some examples of modified roots and their functions?

7. What are the nodes of shoots?

8. Where does most shoot elongation occur?

9. a. What is apical dominance?

b. What is the **benefit of apical dominance**?

c. **Axillary buds can grow into lateral shoots, also referred to as branches.** Under what **two conditions does an axillary bud break dormancy and start elongating?**

1.

2.

10. In addition to elongating shoots and branches, what are some **extra functions performed by stems referred to as...**

a. Rhizomes

b. Bulbs

c. Stolons

d. Tubers

11. The main **function of a leaf** is \_\_\_\_\_. [2]

12. What are **four additional functions that modified leaves can perform?** [2]

13. How can you tell whether or not you are looking at a **leaf or a leaflet** of a compound or double compound leaf?

14. **Plants have three types of tissues.** Name the tissues and provide its function. [2]

a. \_\_\_\_\_ Tissue

Function:

b. \_\_\_\_\_ Tissue

Function:

c. \_\_\_\_\_ Tissue

Function:

15. What is the function of the **cuticle**? [2]

16. **Xylem** conducts \_\_\_\_\_. [2]

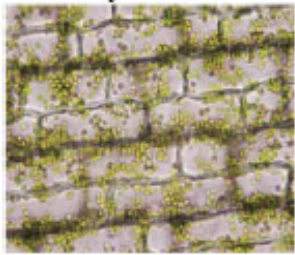
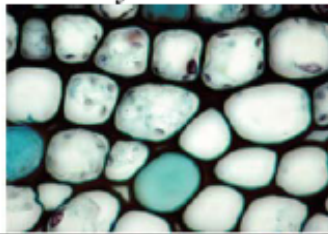
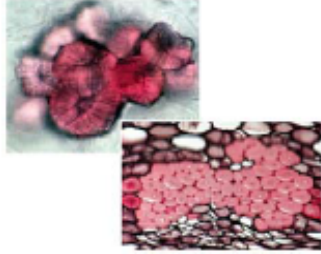


17. **Xylem transport tends to be in one direction, but phloem transport is more complicated.** Explain the pattern of **sugar flow in phloem** tissue. [2]

18. a. What is the **stele**?

b. How does the shape of the stele differ in the roots and stems of angiosperms?

19. The **two major tissues of the ground tissue system are pith and cortex.** Where are they found in the plant? [2]

20. **Plants have five major types of cells.** Below you will find a picture of each cell type. Give the major function of each cell type. Specific questions may follow your general description of the cell type. [2]

<u>Cell Type</u>	<u>Description &amp; Function</u>
<b><i>Parenchyma cells</i></b> 	
<b><i>Collenchyma cells</i></b> 	
<b><i>Sclerenchyma cells</i></b> 	
<b><i>Xylem cells</i></b> 	<p>Label <b>vessel elements</b>, <b>tracheids</b>, and <b>pits</b>.</p>
<b><i>Phloem cells</i></b> 	<p>Label <b>companion cell</b>, <b>sieve tube element</b>, and <b>sieve plate</b>.</p>

21. Compare & Contrast the structure and function of Tracheids and vessel elements. [2]

22. Compare & Contrast the structure and function of Sieve-Tube elements & Companion Cells. [2]

23. Lets not lose sight of the big picture. Complete the following summary charts. [2]

**The three plant organs are**

--	--	--

**The three basic plant tissues are**

--	--	--

**The five basic plant cells are**

--	--	--	--	--

***Meristems generate cells for new organs.*** [2]

24. a. What is the difference between indeterminate and determinate growth? [2]

b. What kind of growth do you as a human experience? Explain.

- c. Although plants generally show indeterminate growth, what are three examples of plant parts that show determinate growth? [2]

25. Flowering plants can be classified based on the length of their life cycle. Explain the difference between...

- a. Annuals
- b. Biennials
- c. Perennials

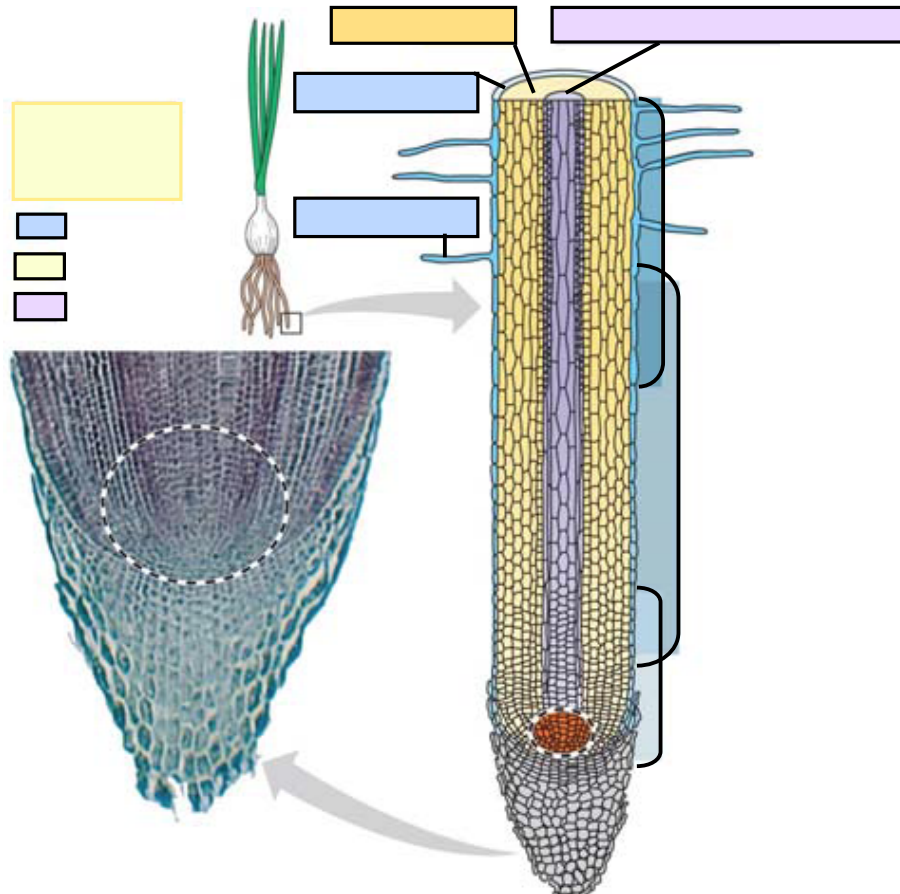
26. Plants are capable of indeterminate growth because they have perpetually embryonic tissues called \_\_\_\_\_. [2]

27. Explain the following relationships. [2]

- a. Apical meristems and primary growth
- b. Lateral meristems and secondary growth
- c. Primary growth and secondary growth

**Primary growth lengthens roots and shoots. [2]**

28. a. See the cross section of a root tip below. Label the structures shown in this figure including the cortex, vascular cylinder, epidermis, apical meristem, root cap, root hair, zone of differentiation, zone of elongation, and zone of cell division. [2]



- b. Explain what happens in the following root zones. [2]

i. Zone of Cell Division

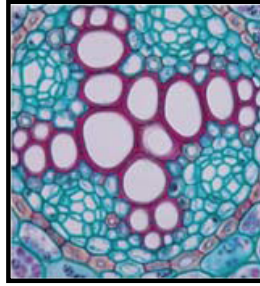
ii. Zone of Elongation

iii. Zone of Differentiation

29. a. The phloem and xylem are found in most roots together in a solid cylinder of vascular tissue at the center of the root. What is this structure called?



- b. The figure below shows this stele of a dicot. (*Remember monocots and dicots refer to types of angiosperms*). Label the **xylem, phloem, endodermis, and pericycle**. [2]



- c. Define the terms endodermis and pericycle [2] and explain their function in the plant.

**Endodermis**

**Pericycle**

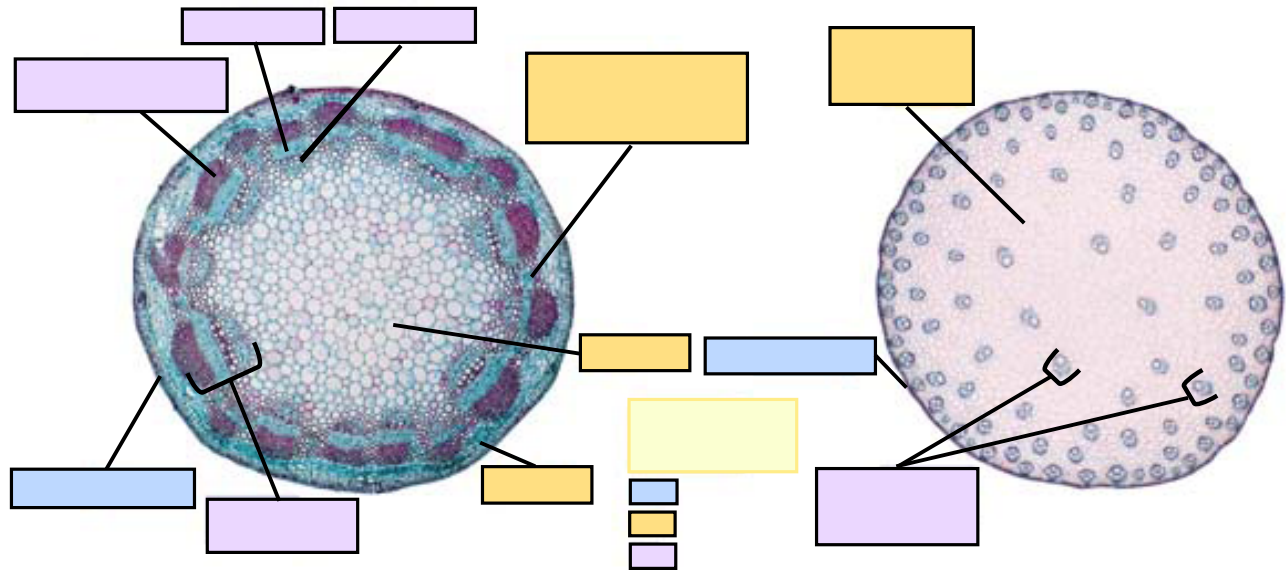
- d. Why must **new roots formed by the pericycle originate in the center of the root?** [2]

30. a. From Figure 35.16, label **shoot apical meristem, leaf primordia, young leaf, developing vascular strand, and axillary bud meristems**. [2]



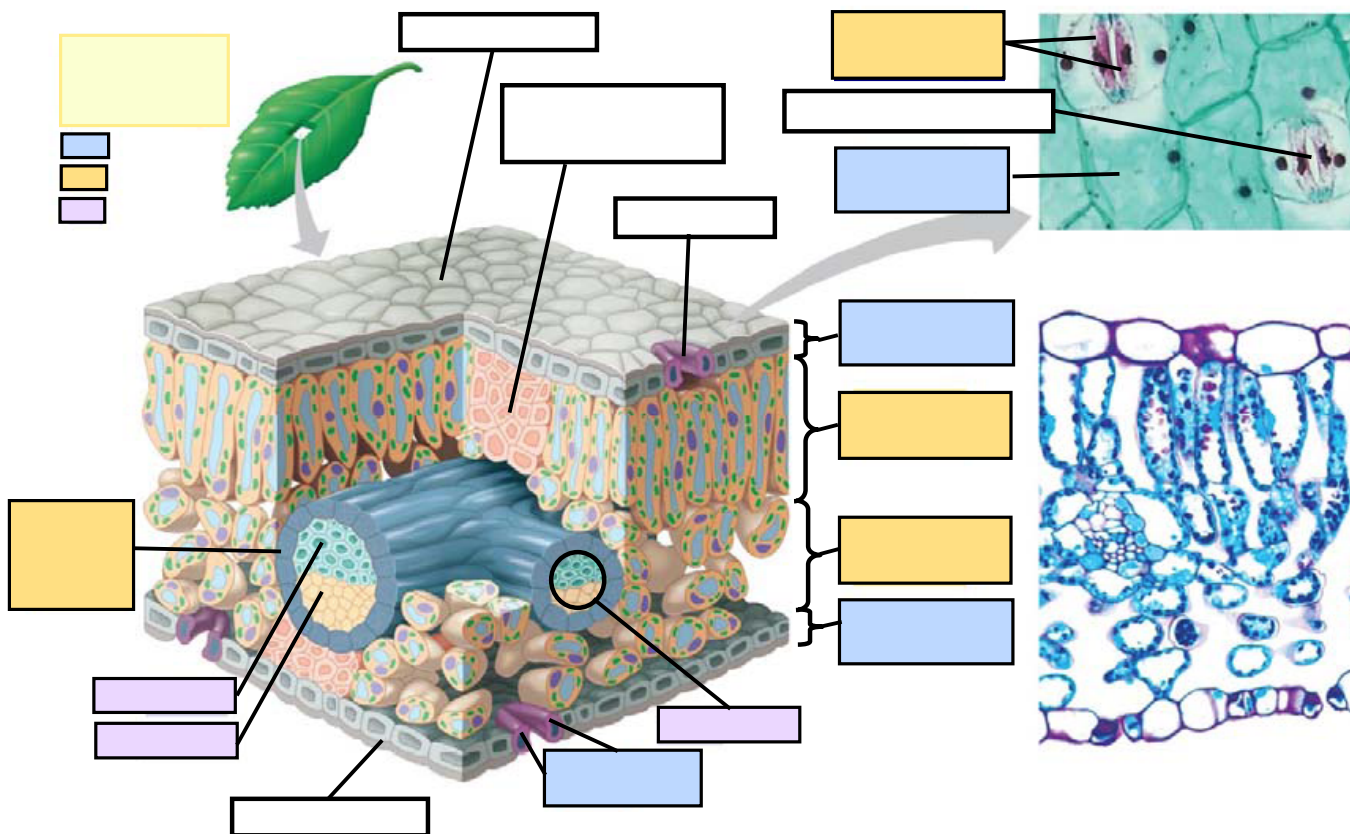
- b. What structure in this figure is responsible for **primary growth**? [2]
- c. What is the **leaf primordial**?

31. a. It is possible to tell a young eudicot from a monocot by the structure of the stem. In the following figure, label the parts including the **eudicot, monocot, epidermis, and vascular bundles**. [2]



- b. How is the **arrangement of vascular bundles different in monocot and dicot stems**? [2]

32. To understand the process of photosynthesis, students are expected to know **leaf structure** in greater detail. Using Figure 35.18, label each structure just as shown in the text. [2]



33. What **gas critical to photosynthesis enters the leaf through stoma**? [2]

34. What is **lost through the stoma that leads to transpiration**? [2]

35. a. Is this a **C3, C4, or CAM leaf**? Explain why?

b. What would be **similar or different in structure and function** if it were the other two. Include labeled drawings. (Refer back to chapter 10 for a complete and accurate answer.)

***Secondary growth adds girth to stems and roots in woody plants. [2]***

36. a. **Primary growth arises from apical meristems** and results in \_\_\_\_\_ of roots, stems, and leaves. [2]
- b. Secondary growth arises from \_\_\_\_\_ and \_\_\_\_\_ cambium and results in increased \_\_\_\_\_ of roots and stems. [2]
37. Describe the following structures and explain what they produce. [2]

**Vascular cambium**

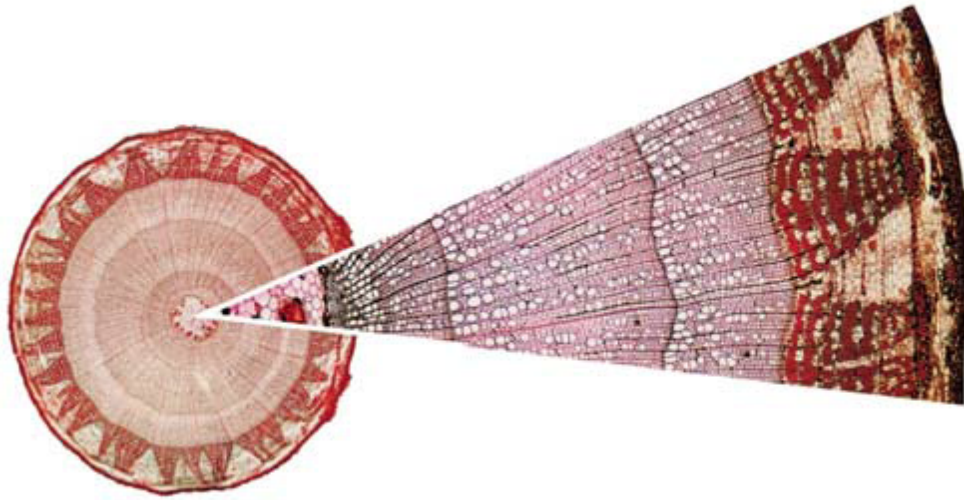
**Cork cambium**

38. Read the text that accompanies Figure 35.19 and then answer these questions. [2]
- a. What **results in primary growth of the stem?**
- b. What cells are formed to the inside and the **outside of the vascular cambium?**
- c. What is the difference in the formation of **primary xylem and phloem versus secondary xylem and phloem?**
39. a. Which tissues are a part of the **bark** of a tree?

b. What vascular tissue is a part of the bark? [2]

c. What is the function of this bark? [2]

40. On this figure, label the cork cambium, cork, periderm, bark, growth ring, secondary xylem, secondary phloem, and vascular cambium. [2]



41. Look back at the stem in Figure 35.19 and find the horizontal slits in the bark, known as lenticels. You may have noticed lenticels on the young twigs of trees or shrubs. What is the function of lenticels? [2]

### ***Skip section 35.5.***

42. Please answer the Self-Quiz at the end of your chapter. *Do your best to try it from memory first in order to test how well you grasped the material.*

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_

### References

1. Campbell *et al.* (2008). AP\* Edition Biology. 8th Ed. San Francisco: Pearson Benjamin Cummings.
2. Adapted from Fred and Theresa Holtzclaw
3. Adapted from L. Miriello