

BUILD Vocabulary

RELATED WORD FORMS *Apex* and *apical* are related word forms. *Apex* is a noun meaning the narrowed or pointed end, or tip, and *apical* is an adjective describing something related to or located at the apex.

Apical Meristems Because the tip of a stem or root is known as the **apex**, meristems in these rapidly growing regions are called **apical meristems**. Unspecialized cells produced in apical meristems divide rapidly, and stems and roots increase in length. **Figure 23–4** shows examples of stem and root apical meristems.

At first, the new cells that are pushed out of meristems are all much alike: They are unspecialized and have thin cell walls. Eventually, they develop into mature cells with different structures and functions. This process is called **differentiation**. As the cells differentiate, they form each of the tissue systems of the plant, including dermal, vascular, and ground tissue.

Meristems and Flower Development The highly specialized cells found in cones and flowers (which are the reproductive organs of seed plants) are also produced in meristems. Flower development begins when the pattern of gene expression changes in a stem's apical meristem. These changes transform the apical meristem of a flowering plant into a floral meristem. Floral meristems produce the tissues of flowers, which include the plant's reproductive organs as well as the colorful petals that surround them.

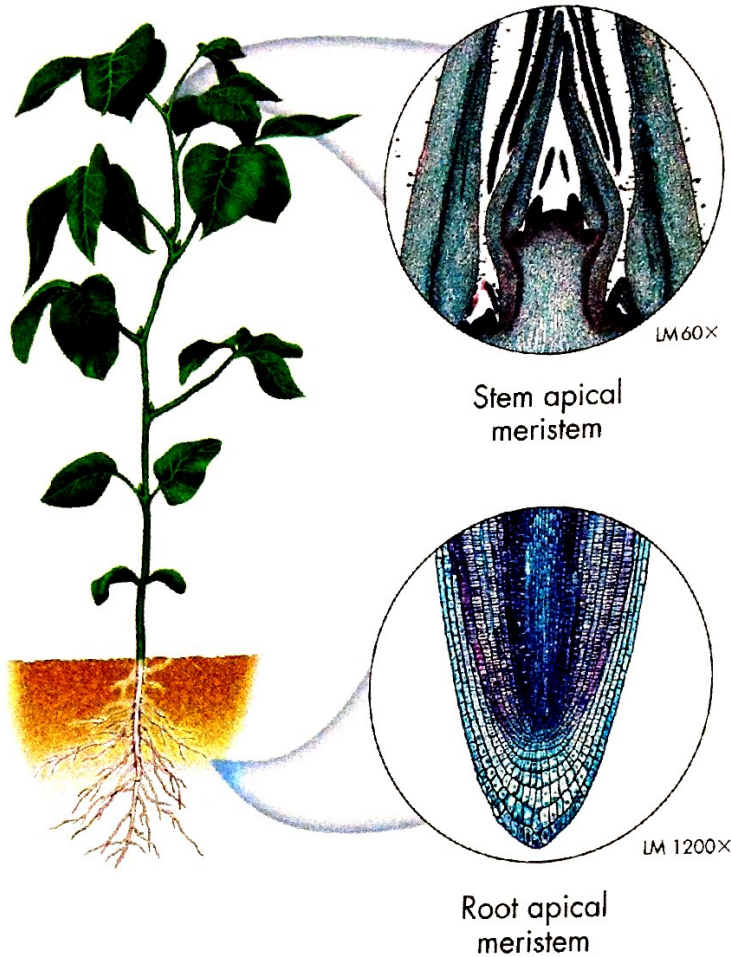


FIGURE 23–4 Apical Meristems Apical meristems are found in the growing tips of stems and roots. Within these meristems, unspecialized cells are produced by mitosis.

23.1 Assessment

Review Key Concepts

- a. Review** What are the three main organs of seed plants?

b. Interpret Diagrams Review **Figure 23–1**. How are the three main organs of seed plants similar in structure?
- a. Review** What are the three main tissue systems of plants?

b. Compare and Contrast How do the main functions of a plant's tissue systems differ?
- a. Review** What is the function of meristems?

b. Form a Hypothesis How might the presence of meristems explain the ability of plants to regenerate from cuttings?

Apply the Big Idea

Structure and Function

- You probably have some knowledge of the human circulatory system. Based on this knowledge, write a paragraph comparing and contrasting the structure and function of the vascular system of a plant to the human circulatory system. *Hint: Show how the systems are alike and different.*