Name_____ Class_____ Date _____

Section 25–2 Plant Responses (pages 639–642)

Key Concepts

- What are plant tropisms?
- What is photoperiodism?
- How do deciduous plants prepare for winter?

Tropisms (page 639)

1. What are tropisms? They are responses of plants to external stimuli.

2. What do tropisms demonstrate about plants? Tropisms demonstrate the ability of plants to respond effectively to external stimuli such as gravity, light, and touch.

3. Complete the table about plant tropisms.

PLANT TROPISMS

Tropism	Definition
Gravitropism	The response of a plant to gravity
Phototropism	The response of a plant to light
Thigmotropism	The response of a plant to touch

4. Circle the letter of each sentence that is true about the effects of thigmotropism.
   - (a.) The tendrils of a grapevine wrap tightly around any object they encounter.
   - (b.) A plant that is touched regularly may be stunted in growth.
   - (c.) The stems of climbing plants don't grow straight up.
   - d. When the tip of a vine encounters an object, it breaks off.

Rapid Responses (page 640)

5. The folding together of mimosa leaflets when touched is the result of what changes in cells at the base of each leaflet? It is the result of changes in osmotic pressure.

6. What does a fly trigger in a Venus' flytrap that causes the leaf to snap shut? It triggers sensory cells on the inside of the flytrap's leaf.

Photoperiodism (page 641)

7. Why are plants such as chrysanthemums and poinsettias called short-day plants? They flower when days are short.

8. What are long-day plants? They are plants that flower when days are long.

Name_____ Class_____ Date _____

9. What is photoperiodism? It is the response of plants to periods of light and darkness.

10. What is photoperiodism in plants responsible for? It is responsible for the timing of seasonal activities such as flowering and growth.

11. What plant pigment is responsible for photoperiodism? Phytochrome

12. How does phytochrome control photoperiodism? It absorbs red light and activates a number of signaling pathways within plant cells. Plants respond to regular changes in these pathways, and these changes determine the patterns of a variety of plant responses.

Extra

Winter Dormancy (pages 641–642)

13. What is dormancy? It is the period during which an organism's growth and activity decrease or stop.

14. How do shorter days and lower temperatures affect photosynthesis? They gradually reduce the efficiency of photosynthesis.

15. As cold weather approaches, what happens to deciduous plants? They turn off photosynthetic pathways, transport materials from leaves to roots, and seal leaves off from the rest of the plant.

16. When days shorten at summer's end, what changes start a series of events that gradually shuts down the leaves of a flowering plant? The phytochrome in leaves absorb less light, auxin production drops, and the production of ethylene increases.

17. The layer of cells at the petiole that seals off a leaf from the vascular system is called the abscission layer.

18. Why doesn't a tree's sap freeze during a cold winter? At the onset of winter, xylem and phloem tissues pump themselves full of ions and organic compounds. These molecules act like antifreeze in a car, preventing the sap from freezing.

Reading Skill Practice

A flowchart can help you remember the order in which events occur. On a separate sheet of paper, create a flowchart that describes the steps that take place when flowering plants lose their leaves as winter approaches. This process is explained in the subsection Winter Dormancy. For more information about flowcharts, see Organizing Information in Appendix A at the back of your textbook.

Students' flowcharts should begin with the shortening of days, which causes the phytochrome in leaves to absorb less light, and should end with leaves falling to the ground.