32 Assessment

32.1 The Skeletal System

Understand Key Concepts

1. The network of tubes that runs through compact bone is called the
   a. periosteum.
   b. joint.
   c. Haversian canals.
   d. marrow.

2. What occurs during ossification?
   a. Bones lose minerals and mass.
   b. Cartilage is replaced by bone.
   c. Vitamin D is synthesized.
   d. Bones fracture more easily.

3. Small sacs of synovial fluid that help reduce friction between the bones of a joint are called
   a. bursae.
   b. ligaments.
   c. tendons.
   d. cartilage.

4. What types of tissues are found in the skeletal system?

5. What is the advantage of spongy bone tissue in the ends of long bones?

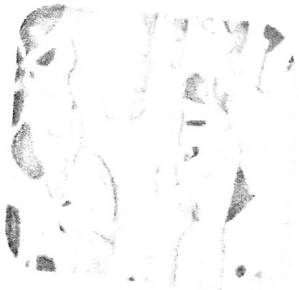
6. Draw a diagram of a long bone and label the structures.

7. Which type of freely movable joint allows for the most range of motion?

Think Critically

8. **Interpret Visuals** Which bone sample shows signs of osteoporosis, choice *a* or choice *b*? Explain.

a.



b.

9. **Infer** Disks of rubbery cartilage are found between the individual bones in the spinal column. What function do you think these disks serve?

10. **Craft and Structure** Blood vessels bring oxygen and nutrients to all parts of the body. Ligaments contain fewer blood vessels than some other tissues do. Explain how this difference might relate to the rate of healing in injured ligaments?

11. **Use Models** Suppose you want to build a robotic arm that works the way the human elbow works. Describe or sketch three facts about the elbow that you could use in your planning.

32.2 The Muscular System

Understand Key Concepts

12. In which part of the body would you find striated muscle tissue with relatively small cells that have one or two nuclei?
   a. thigh
   b. stomach
   c. blood vessels
   d. heart

13. Two proteins that are involved in the contraction of muscle are
   a. sarcomere and myofibril.
   b. actin and myosin.
   c. periosteum and cartilage.
   d. ATP and acetylcholine.

14. The point of contact between a motor neuron and a skeletal muscle cell is called a
   a. cross-bridge site.
   b. gap junction.
   c. sarcomere.
   d. neuromuscular junction.

15. Describe the primary function of each of the three types of muscle tissue.

16. **Key Ideas and Details** Use the sliding-filament model to trace how skeletal muscles work.

17. Describe how the release of acetylcholine from a motor neuron affects a muscle cell.

18. **Craft and Structure** Explain the meaning of the statement: "Most skeletal muscles work in opposing pairs."

19. **Craft and Structure** How does the difference between the structure of fast-twitch and slow-twitch

Think Critically

20. **Relate Cause and Effect** Certain bacteria produce a toxin that prevents the release of acetylcholine from the motor neurons. Explain why this can result in a fatal loss of muscle movement.

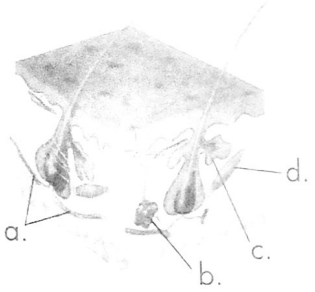
21. **Research to Build and Present Knowledge** Although exercising can increase your strength and endurance, over-exercising can have adverse effects on the body. Use multiple library and Internet resources to find out about these adverse effects. Summarize your findings in a brief report. Include a list of the sources you use.

32.3 Skin—The Integumentary System

Understand Key Concepts

22. The outer layer of skin is called the
    a. dermis.
    b. keratin.
    c. epidermis.
    d. melanin.

23. Which structure releases a secretion that contributes to the formation of acne?



24. Where are new skin cells produced to replace old cells that have been shed?
    a. in the outer layer of the epidermis
    b. in the inner layer of the epidermis
    c. in the dermis
    d. in the sebaceous glands

25. Describe three ways the integumentary system performs the function of protection.

26. Compare the structures of the inner and outer layers of the skin.

27. Describe two ways the skin helps to maintain homeostasis.

28. How do fingernails and toenails grow?

solve the CHAPTER MYSTERY

THE DEMISE OF A DISEASE

The search for the cause and a cure for rickets revealed two findings. Both cod liver oil and exposure to ultraviolet light could prevent and cure rickets.

The first finding indicated that cod liver oil contains a nutrient involved in bone health. Starting in the 1930s, many parents in the United States—including the parents of one of this textbook's authors—gave their children a daily dose of bitter cod liver oil.

The second finding indicated that exposure to the sun influences bone health. This explained why children in colder climates were more susceptible to rickets. They had little sun exposure during cold, dark winter months.

But scientists still wondered, what was the connection between cod liver oil and ultraviolet light? How could both treatments result in the same positive outcome?

Through the work of many scientists, we now know that vitamin D is the responsible nutrient in cod liver oil. And, when exposed to ultraviolet light, the skin makes compounds that can be converted to vitamin D. We've also learned that vitamin D helps the body absorb calcium and phosphorus from the digestive system.

Children today are spared cod liver oil doses because vitamin D is added to milk. Rickets is now a rare disease in the United States.

1. **Explain** Why were children in southern cities less likely to develop rickets?

2. **Compare and Contrast** Describe the structure of the bones of a healthy child in comparison to the bones of a child who developed rickets.

3. **Connect to the Big Idea** Explain how vitamin D is related to the structure and function of the three systems you learned about in this chapter.