

Chapter 36

Skeletal, Muscular, and Integumentary Systems

Section 36–1 The Skeletal System (pages 921–925)

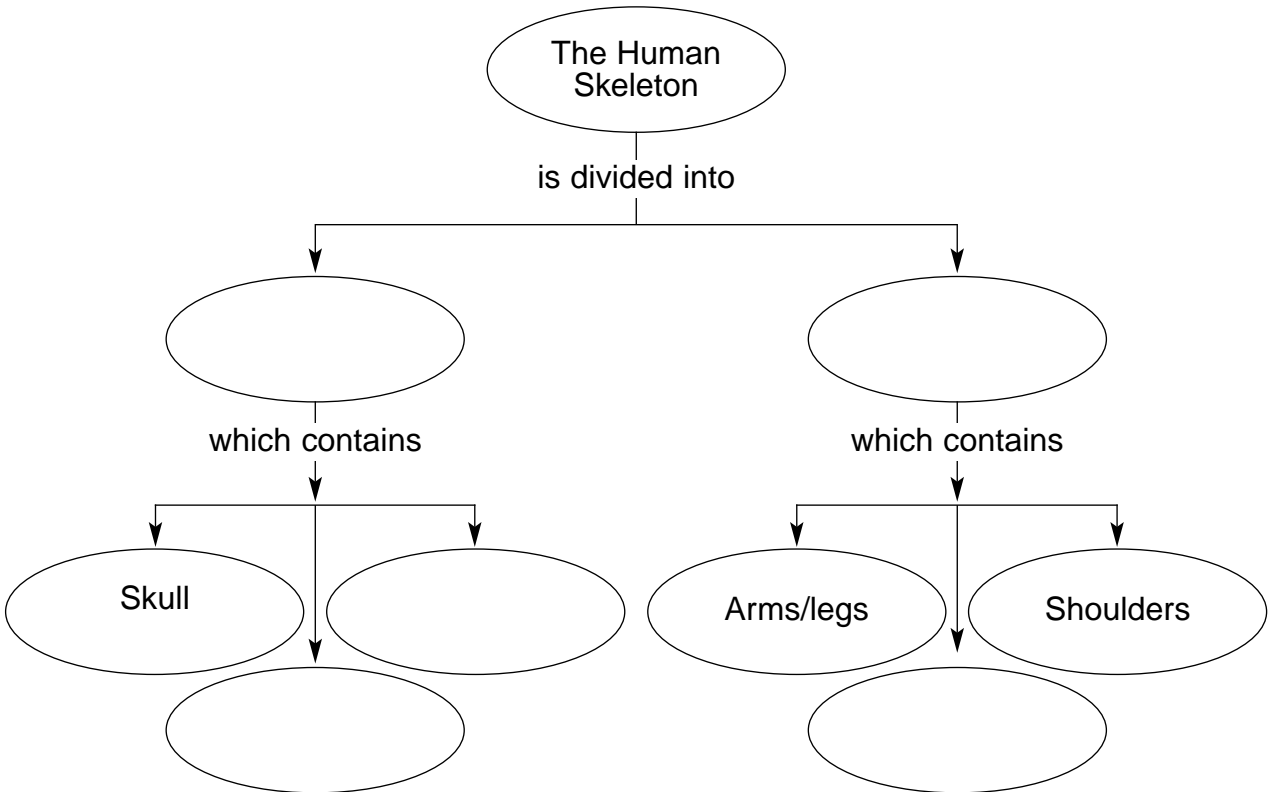
This section describes the skeletal system and its functions.

Introduction (page 921)

1. What forms the skeletal system? _____

The Skeleton (page 921)

2. List the functions of the skeletal system.
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
3. Is the following sentence true or false? Bones act like levers on which muscles act to produce movement. _____
4. Is the following sentence true or false? There are 106 bones in the adult human skeleton. _____
5. Complete the concept map.



© Pearson Education, Inc. All rights reserved.

6. What is the general function of the axial skeleton? _____

Chapter 36, Skeletal, Muscular, and Integumentary Systems *(continued)*

Structure of Bones *(page 922)*

7. The two minerals that make up most of the mass of bone are _____ and _____.
8. Is the following sentence true or false? Bones are living tissue.

Match each structure in a bone with its description.

Structure	Description
_____ 9. Periosteum	a. Network of tubes running through bone
_____ 10. Compact bone	b. Soft tissue contained in bone cavities
_____ 11. Haversian canals	c. Tough layer of connective tissue surrounding bone
_____ 12. Spongy bone	d. Thick layer of dense bone beneath the periosteum
_____ 13. Bone marrow	e. Bone with a latticework structure

Development of Bones *(pages 922–924)*

14. The skeleton of a newborn baby is composed almost entirely of a type of connective tissue called _____.
15. The network of fibers in cartilage is made from two proteins called _____ and _____.
16. Circle the letter of each sentence that is true about cartilage.
- | | |
|-------------------------------|------------------------------|
| a. It contains blood vessels. | c. It cannot support weight. |
| b. It is dense and fibrous. | d. It is extremely flexible. |
17. Cartilage is replaced by bone during the process of bone formation called _____.
18. Cells that create bone are called _____.
19. Is the following sentence true or false? By adulthood, all the cartilage in the body has been replaced by bone. _____

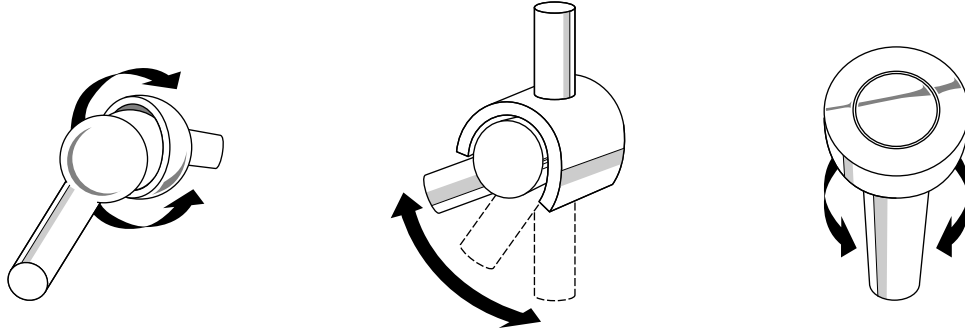
Types of Joints *(page 924)*

20. What is a joint? _____

21. List the three classifications of joints, based on their type of movement.
- | | | |
|----------|----------|----------|
| a. _____ | b. _____ | c. _____ |
|----------|----------|----------|
22. What are examples of immovable joints? _____

23. Is the following sentence true or false? The joints between the two bones of the lower leg are slightly movable joints.

24. Identify the type of freely movable joint represented in each of the drawings below.



25. Is the following sentence true or false? Ball-and-socket joints permit the widest range of movement. _____

Structure of Joints (page 925)

26. Circle the letter of each sentence that is true about the structure of joints.
- a. Cartilage protects the ends of bones as they move against each other at joints.
 - b. Ligaments hold bones together at joints.
 - c. Synovial fluid prevents the ends of bones from slipping past each other at joints.
 - d. A bursa is a swelling caused by inflammation of a joint.
27. A serious disorder that involves inflammation of one or more joints is _____.

Section 36–2 The Muscular System (pages 926–931)

This section describes types of muscles and explains how muscles contract.

Types of Muscle Tissue (pages 926–927)

1. List the three different types of muscle tissue.
 - a. _____
 - b. _____
 - c. _____
2. Is the following sentence true or false? Each type of muscle has the same structure. _____
3. Is the following sentence true or false? Skeletal muscles are usually attached to bones. _____
4. Circle the letter of each sentence that is true about skeletal muscles.
 - a. They have stripes.
 - b. Most of them are controlled by the central nervous system.
 - c. Their cells have just one nucleus.
 - d. Their cells are long and slender.

Chapter 36, Skeletal, Muscular, and Integumentary Systems *(continued)*

5. Circle the letter of each sentence that is true about smooth muscle cells.
 - a. They are spindle-shaped.
 - b. They can function without nervous stimulation.
 - c. They have two or more nuclei.
 - d. They are connected by gap junctions.
6. What are three functions of smooth muscles? _____

7. Is the following sentence true or false? Cardiac muscle cells always have two nuclei. _____
8. Complete the table that compares and contrasts the three types of muscle tissue.

TYPES OF MUSCLE TISSUE

Muscle Tissue Type	Striated/Not Striated	What It Controls
Skeletal	Striated	
	Not striated	Involuntary movements
Cardiac		

Muscle Contraction (page 928)

9. Circle the letter of the choice that lists the muscle structures from largest to smallest.
 - a. Myofibrils, filaments, muscle fibers
 - b. Muscle fibers, myofibrils, filaments
 - c. Muscle fibers, filaments, myofibrils
 - d. Myofibrils, muscle fibers, filaments

Match each type of muscle filament with the protein it contains.

Type of Filament	Protein It Contains
_____ 10. thick	a. Actin
_____ 11. thin	b. Myosin

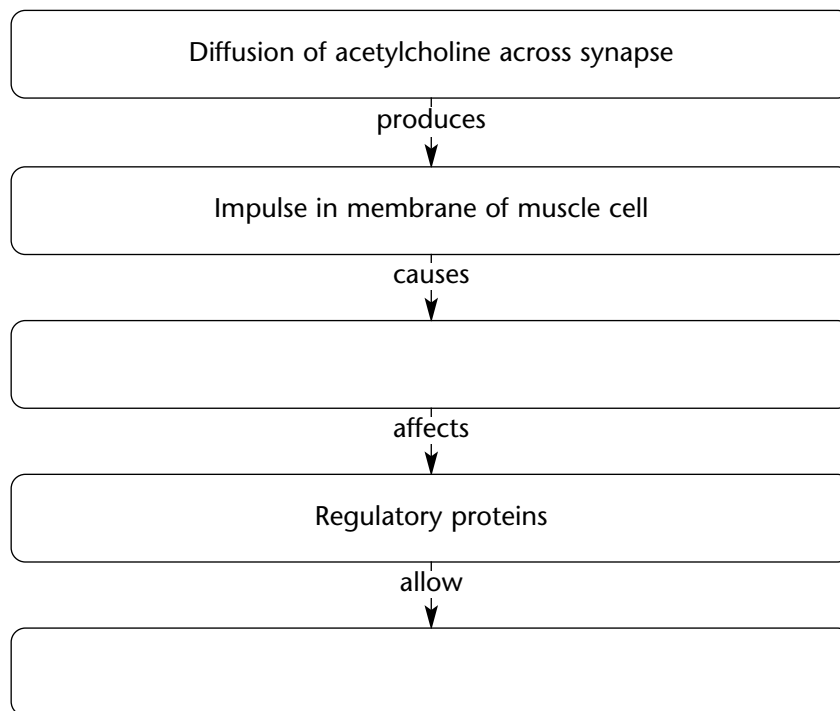
12. The filaments are arranged along the muscle fiber in units called _____.
13. Is the following sentence true or false? When a muscle is relaxed, there are only thin filaments in the center of a sarcomere.

14. How does a muscle contract according to the sliding-filament model of muscle contraction? _____

15. The energy for muscle contraction is supplied by _____.

Control of Muscle Contraction (page 929)

16. Is the following sentence true or false? Impulses from motor neurons control the contraction of skeletal muscles. _____
17. The point of contact between a motor neuron and a skeletal muscle cell is a(an) _____.
18. Complete the flowchart to show the missing steps in the stimulation of a muscle cell by a neuron.



19. What terminates a muscle contraction? _____

20. Is the following sentence true or false? A single motor neuron can form synapses with just one muscle cell. _____
21. How can there be strong and weak muscle contractions if a single muscle fiber always contracts to its full extent? _____

How Muscles and Bones Interact (pages 930–931)

22. Is the following sentence true or false? Individual muscles can pull in only one direction. _____

Chapter 36, Skeletal, Muscular, and Integumentary Systems *(continued)*

23. Circle the letter of the term that refers to the tough connective tissue joining skeletal muscle to bone.
a. cartilage b. ligament c. tendon d. bursa
24. If bones are like levers, what functions as a fulcrum? _____
25. What does it mean for muscles to “work in opposing pairs”? _____

26. Which two opposing muscles allow the elbow joint to bend and extend? _____

27. Is the following sentence true or false? Skeletal muscles generally remain in a state of total relaxation when you are at rest.

28. What is resting muscle tone? _____

29. How can muscle tone be increased? _____

Reading Skill Practice

When you read a section with many details, writing an outline may help you organize and remember the material. Outline Section 36–2 by first writing the section headings as major topics in the order in which they appear in the book. Then, beneath each major topic, list important details about it. Title your outline *The Muscular System*. Do your work on a separate sheet of paper.

Section 36–3 The Integumentary System (pages 933–936)

This section describes the integumentary system and its functions.

Introduction (page 933)

1. Circle the letter of each choice that is part of the integumentary system.
a. skin b. bones c. cartilage d. nails

The Skin (pages 933–935)

2. The most important function of the skin is _____.
3. List the four functions of the integumentary system.
a. _____
b. _____
c. _____
d. _____

4. The largest component of the integumentary system is the _____.
5. The outer layer of skin is called the _____.
6. Is the following sentence true or false? The inner layer of the epidermis is made up of dead cells. _____

Match each term with its definition.

	Term	Definition
_____	7. keratin	a. Tough, fibrous protein
_____	8. melanin	b. Inner layer of the skin
_____	9. dermis	c. Dark brown pigment

10. Circle the letter of each sentence that is true about melanocytes.
 - a. Melanocytes are cells that produce melanin.
 - b. Most people have roughly the same number of melanocytes in their skin.
 - c. All melanocytes produce about the same amount of melanin.
 - d. Most people have the same distribution of melanocytes in their skin.

11. Is the following sentence true or false? The epidermis contains blood vessels. _____

12. Circle the letter of each type of structure that is found in the dermis.

- | | |
|------------------|-------------------|
| a. blood vessels | c. glands |
| b. nerve endings | d. hair follicles |

13. How does the dermis help regulate body temperature? _____

14. List the two types of glands contained in the dermis.

- | | |
|----------|----------|
| a. _____ | b. _____ |
|----------|----------|

15. How does sweat help keep you cool? _____

16. What is the function of sebum? _____

Hair and Nails (page 936)

17. The basic structure of human hair and nails is _____.

18. List the two functions of head hair.

- | |
|----------|
| a. _____ |
| b. _____ |

Chapter 36, Skeletal, Muscular, and Integumentary Systems *(continued)*

19. How does hair in the nose and ears and around the eyes help protect the body? _____

20. Hair is produced by cells called _____.
21. Is the following sentence true or false? Hair is composed of cells that have died. _____
22. What causes hair to grow? _____

23. What is the nail root? _____

WordWise

Test your knowledge of the vocabulary terms from Chapter 36 by solving the clues. Then, copy the numbered letters in order to complete the hidden message.

Clues

Vocabulary Terms

Place where one bone attaches to another

— 1 — 2 —

Tough layer surrounding a bone

— 3 — — — 4 — — — —

Tough connective tissue that holds bones together

— — — 5 — — — 6 —

Inner layer of the skin

7 — — — 8 — —

Type of junction where a motor neuron and a skeletal muscle cell have contact

— — — 9 — — — — — 10 11 — — 12 — —

Type of connective tissue making up the skeleton of a newborn baby

— — — — — — — — — — 13

Replacement of cartilage by bone during the process of bone formation

— — — 14 — — — — — — — — — —

Protein in thick filaments in muscle

15 — — — 16 — — — —

Type of canal that runs through bone and contains blood vessels and nerves

— — — 17 18 — — — — —

Neurotransmitter that diffuses across a synapse to a muscle cell

— — — — — 19 — — — — — 20 — — — — —

Hidden Message: B

1 2 3 4 5 6 7

8 9 10 11 12 13 14 15 16 17 18 19 20 u.