In your textbook, read about the structure of the skeletal system and joints.

Identify the following as being part of the axial or appendicular skeleton.

1. the tarsals, metatarsals, and phalanges in your foot
2. the seven vertebrae in your neck
3. your rib cage
4. the bones in your shoulder
5. your lower jaw
6. the humerus in your arm

For each answer below, write an appropriate question.

7. **Answer:** They are bands of connective tissue that attach muscles to bones.
   **Question:** __________________________________________________________________________

8. **Answer:** Fluid-filled sacs that reduce friction between bones in a joint.
   **Question:** __________________________________________________________________________

9. **Answer:** They connect bones to other bones.
   **Question:** __________________________________________________________________________

10. **Answer:** One allows the bones to move back and forth; the other allows the bones to rotate.
    **Question:** __________________________________________________________________________

In your textbook, read about the formation of bone and bone growth.

Complete each sentence.

11. In a human embryo’s skeleton, _________________ is gradually replaced by _________________ except in a few places like the tip of the ________________ .

12. Some cells in cartilage are stimulated to become ________________ . They secrete a substance in which ________________ ________________ and other minerals are deposited.

13. Your bones increase in length near their ________________ .

14. Even after you reach your full adult height, the bone-forming cells in your body will still be involved in ________________ and ________________ .
In your textbook, read about compact and spongy bone and skeletal system functions. 

Answer the following questions.

15. If you cut through to the center of a large leg bone, what bone components (in order, from the outside in) would you encounter?

16. How do blood vessels and nerves reach individual bone cells in compact bone?

17. What role does bone marrow play in the functioning of your circulatory system?

18. In what way is the skeleton a storehouse?

In your textbook, read about growth, mineral storage, and injury and disease in bone. 

Determine if the statement is true or false.

19. Once you have finished growing, your bones no longer change.

20. Calcium is both deposited in and removed from bones.

21. Calcium removed from bone is rapidly excreted in the urine as an unnecessary body waste.

22. As a person ages, his or her bone density usually decreases.

23. Because bones in an adult’s skeleton are harder than children’s bones, adults are less likely to break a bone in a fall.

24. Osteoporosis is most common in older women because they rarely include milk in their diet.
In your textbook, read about three types of muscles and skeletal muscle contraction.

Complete the table by checking the correct column for each description.

<table>
<thead>
<tr>
<th>Description</th>
<th>Smooth</th>
<th>Skeletal</th>
<th>Cardiac</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. under voluntary control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. striated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. slow, prolonged contractions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. attached to bones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. found only in the heart</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. not under voluntary control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. lines cavities and surrounds organs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In your textbook, read about muscle strength and exercise.

If the statement is true, write true. If it is not, rewrite the italicized part to make it true.

8. Muscle strength depends on the number of fibers in a muscle.

9. When oxygen is limited, aerobic respiration becomes a muscle’s primary source for ATP.

10. During lactic acid fermentation, oxygen builds up in muscle cells.

11. A drop in the amount of lactic acid in the bloodstream indicates that muscular activity has decreased.
Basic Concepts

Skeleton and Joints

Use with Chapter 34, Section 34.2

- Shoulder: Ball-and-socket joint
- Neck vertebrae: Pivot joint
- Elbow: Hinge joint
- Wrist: Gliding joint
- Ligament
1. Explain how a pivot joint works.

2. What is the difference between ligaments and tendons?

3. Look at the different types of joints highlighted in the separate boxes on the transparency. What do all of the joints have in common? What type of joint is not highlighted in a separate box?

4. Describe the action of a gliding joint.

5. Why is it important for the structure known as a bursa to be located between movable bones in places such as the shoulder and knee?

6. Identify three hinge joints other than the elbow.


8. Where do most joint injuries tend to occur? Why?
Structure of Bone

Use with Chapter 34, Section 34.2

1. Describe the location and function of the osteon systems.

2. What is the function of the membrane that covers compact bone?

3. What are the various sites in the skeletal system where bone marrow can be found?

4. Briefly describe the formation of bone from cartilage.

5. Where do bones grow in diameter? Where do they grow in length?

6. What types of cells are produced by red bone marrow?

7. What is the function of yellow bone marrow?

8. What is the innermost layer component of a bone?

9. What component of bone secretes a substance in which minerals are deposited?

10. Describe a vital function of bones other than providing physical support for the body. What parts of the bone carry out this function?
Muscle Contraction

Use with Chapter 34, Section 34.3

Basic Concepts

Bone  Tendon  Skeletal muscle

Bundles of muscle fibers

Relaxed  Contracting  Maximally contracted

Two sarcomeres

Myofibril  Filaments  Sarcomere
1. What causes the striated appearance of skeletal muscles?

2. What is a sarcomere?

3. When a nerve signals a muscle to contract, where is calcium released?

4. Study the drawings in the transparency showing two sarcomeres in relaxed, contracting, and maximally contracted states. What happens in the presence of calcium?

5. What is needed besides calcium for contraction to occur?

6. What is the name of the theory of muscle contraction illustrated in the transparency?

7. In terms of your control over muscle contraction, how does skeletal muscle differ from smooth muscle or cardiac muscle?

8. In what way is the appearance of cardiac muscle similar to that of skeletal muscle?