All multicellular animals that can move to escape harm or to capture food have an advantage over those animals that cannot move.

After the successful completion of this unit, you should be able to do the following:

1. Explain the advantage of movement for animals.
2. Explain how the skeletal system works with the muscular system to allow an animal to move.
3. Explain how muscles work to move a bone.
4. Explain the components and purpose of the skeletal system.
5. Explain the components and purpose of the muscular system.
6. Be able to use the following words correctly:

<table>
<thead>
<tr>
<th>multicellular</th>
<th>Tendons</th>
</tr>
</thead>
<tbody>
<tr>
<td>skeletal system</td>
<td>joints</td>
</tr>
<tr>
<td>muscular system</td>
<td>contracting</td>
</tr>
<tr>
<td>unicellular</td>
<td>bicep</td>
</tr>
<tr>
<td>ligaments</td>
<td>tricep</td>
</tr>
<tr>
<td></td>
<td>vertebrate</td>
</tr>
</tbody>
</table>
All multicellular animals need to move in order to capture food and escape harm. Movement in animals is controlled by 2 systems working together:

1) The skeletal system
2) The muscular system

Unlike unicellular organisms, multicellular organisms are often much larger and harder to move.

Skeletal System:

Your skeletal system consists of all the bones and joints in your body and all of the tissue that connects the bones together and the tissue that connects the bones to the muscles. The primary function of the skeletal system is to provide support for the body. The skeleton also protects vital organs as a secondary function. The skull protects the brain and the sternum and rib cage protect the lungs and heart.

Bones are connected to other bones by tissue called ligaments. Ligaments are strong strands of tissue that keep bones from separating. A joint is where 2 bones meet. Usually ligaments surround the joints to help keep the bones in place. Tendons are tissue that holds bones and muscles together. They are also strong strands of tissue.

Interesting Scientific Fact: There are 206 bones in the human body. That is the same number of bones as a giraffe.

Interesting Scientific Fact: The femur is name of the largest bone in the human skeleton. It is the bone between your hip and knee.

REMEMBER THIS !!!

The skeletal system provides support for the body.

Question 1. What are the main components of the skeletal system?
Question 2. What is the primary function of the skeletal system?
Question 3. What is the secondary function of the skeletal system?
Muscular System:

Your muscular system consists of all of the muscles in your body. Although there are many different types of muscles in your body, we will look at those that connect to the bones. The main function of the muscular system is to move the bones in your skeleton. When the muscles move the bones, the body moves.

Skeletal muscles work together. They work by contracting, or getting smaller. Usually at least 2 muscles are required to move a bone. One muscle moves a bone in a certain direction. The other muscle moves the bone back. The muscles work together but opposite of each other. A good example of this is the work done by the bicep and tricep muscles in your arm. When the bicep muscle contracts, it moves the bones in the arm and the elbow bends. When the tricep muscle contracts, it moves the bones back and the elbow straightens.

**Interesting Scientific Fact:** For most humans, it takes 13 muscles to smile and 43 muscles to frown.

**REMEMBER THIS !!!**

The muscular system moves bones. Animals move when their muscles move their bones.

**Question 4.** What are the main components of the muscular system?

**Question 5.** What is the job of the muscular system?

**How it Works**

It is an advantage when animals can move. It allows them to search for food and avoid danger. Plants cannot move to prevent being eaten by a cow. Since multicellular animals can be quite large, like elephants, they are unable to use the simple means of movement like the unicellular organisms. The system most animals use is a combination of bones and muscles.

In the simplest terms, you are able to move because your brain tells your muscles to move your bones. Then, you move. Joints are also needed because they allow the skeleton to be flexible—to bend in many different ways. Cartilage surrounds joints and holds neighboring bones together. Tendons hold bones to their muscle. The skeletal and muscular systems work together to move a body.

**Question 6.** Explain in detail how the skeletal and muscular systems work together to move a body.
Animals must be able to move. They must be able to find their food and avoid becoming food for other organisms. In order to move, larger animals with a backbone, called vertebrates, need bone and muscle. Bone is part of the skeletal system and muscle is part of the muscular system.

Vertebrates have muscle attached to their bones. The muscle is attached with tissue called tendons. A muscle works by getting shorter. This is called contracting. If the muscle is not attached to anything, no movement can occur. When a muscle relaxes, it gets a little longer.

One example of a muscle is called the bicep. It bends your lower arm toward your upper arm. When the bicep is contracted, it shortens. Because the tendon of the bicep attached to the lower arm, the shortened muscle pulls the lower arm toward the upper arm. The elbow bends. There is another muscle to produce the opposite motion. It is called the tricep. When it contracts, or shortens, it causes the lower arm to extend away from the upper arm, or straighten the elbow.

Muscles tend to be paired to work in the opposite direction. A bicep will bend an arm and a tricep will straighten it. The two muscles can only get shorter. It is the tendons that are attached to the arm bones that allow the muscle and bone to work together to produce movement.
Movement in Animals—Skeletal Muscular System
Test Yourself

Matching

_____ 1. bicep  
   a. a muscle that straightens the elbow joint

_____ 2. tricep  
   b. a muscle that bends the elbow joint

_____ 3. contract  
   c. tissue that connects muscle to bone

_____ 4. tendon  
   d. how a muscle works

True or False

_____ 1. The skeletal system includes bones, muscles and tendons.

_____ 2. The skeletal system includes all of the bones.

_____ 3. Tendons attach bone to other bones.

_____ 4. Tendons attach muscle to bones.

_____ 5. When a muscle contracts, it gets shorter.

_____ 6. When a muscle contracts, it gets longer.

_____ 7. The bicep muscle causes the knee to bend.

_____ 8. The bicep muscle causes the elbow to bend.

_____ 9. The tricep muscle causes the elbow to bend.

_____ 10. When the tricep contracts, the elbow is straightened.

_____ 11. In order for a vertebrate to move, its bones and muscles must work together.
Fill in the Blank

1. A muscle is attached to a bone with a _________________.
2. When a bicep contracts, it causes the elbow to ____________.
3. A ______________ is an example of a muscle that bends a joint.
4. When a tricep contracts, it causes the elbow to __________________.
5. A _______________ is an example of a muscle that straightens a joint.
6. To produce movement, a vertebrate must use its ______________ and ____________ together.

Answer the Following

1. List and explain all of the part of the skeletal system.

2. List and explain all of the parts of the muscular system.

3. Why do vertebrates need to be able to move?

4. Explain how the skeletal and muscular systems work together in order for movement to occur.
Question 1. What are the main components of the skeletal system?

Question 2. What is the PRIMARY function of the skeletal system?

Question 3. What is the Secondary function of the skeletal system?

Question 4. What are the main components of the muscular system?

Question 5. What is the job of the muscular system?

Question 6. Explain in detail how the skeletal and muscular systems work together to move a body.