Name _____ Date _____ Class _____



# The Muscular System

## Key Concepts

- What types of muscles are found in the body?
- Why do skeletal muscles work in pairs?

There are about 600 muscles in your body. The muscles that are not under your conscious control are called **involuntary muscles.** Involuntary muscles are responsible for activities such as breathing and digesting food. The muscles that are under your control are called **voluntary muscles.** Smiling and turning the pages in a book are actions of voluntary muscles.

**Your body has three types of muscle tissue—skeletal muscle, smooth muscle, and cardiac muscle. Some of these muscle tissues are involuntary, and some are voluntary. Skeletal muscles** are attached to the bones of your skeleton. At the end of a skeletal muscle is a tendon. A **tendon** is a strong connective tissue that attaches muscle to bone. Because you have conscious control of skeletal muscles, they are classified as voluntary muscles. These muscles provide the force that moves your bones. Skeletal muscles react quickly and tire quickly. Skeletal muscle cells appear banded, or striated. For this reason, they are sometimes called **striated muscles.**

**Smooth muscles** are called involuntary muscles because they work automatically. They are inside many internal organs of the body, and control many types of movements inside your body, such as those involved in the process of digestion. Smooth muscles react more slowly and tire more slowly than skeletal muscles. **Cardiac muscles** are involuntary muscles found only in the heart. Cardiac muscles do not get tired.

Muscles work by contracting, or becoming shorter and thicker. **Because muscle cells can only contract, not extend, skeletal muscles must work in pairs. While one muscle contracts, the other muscle in the pair relaxes to its original length.** For example, in order to move the lower arm, the biceps muscle on the front of the upper arm contracts to bend the elbow. This lifts the forearm and hand. As the biceps contracts, the triceps on the back of the upper arm returns to its original length. To straighten the elbow, the triceps muscle contracts while the biceps returns to its original length.

Exercise is important for maintaining both muscular strength and flexibility. Exercise makes individual muscle cells grow wider, thicker, and stronger. Sometimes, muscle injuries such as strains and cramps, can occur. Resting the injured area can help it heal.