Chapter 13

Control and Movement

Photo Credit: Anne-Marie Keppel

13.4 The Skeleton

The human skeleton, shown in Figure 13.9, is made up of the bones and cartilages that protect and support the body. Adults have 206 bones in all. Babies are born with more, but many of these bones fuse during growth. The largest bone in the body is the femur, or thigh bone. The smallest is the stirrup, a bone in the middle ear that is about a quarter of a centimeter long. Besides bones, the skeleton includes several cartilages, including your external ears (pinnas) and the tip of your nose.

One function of the skeleton is to protect the body. For example, the skull protects the brain, the vertebrae protect the spinal cord, and the ribs protect the heart and lungs. A second function of the skeleton is to support the body and, with the help of the muscles, move it. Joints are movable connections between bones. Some joints, like the elbow and knee, act like hinges, bending in only one direction. Other joints, like the one between the hip and thigh, resemble a ball and socket and allow for a greater range of motion. At a joint, the ends of connecting bones are covered with smooth cartilage and enclosed in a fluid-filled capsule. The fluid lubricates the joint so that the bones can move smoothly, without rubbing against each other. *Arthritis* is a condition where the tissues of the joint become inflamed and produce too much fluid. Both the inflammation and excess fluid cause painful bone damage.

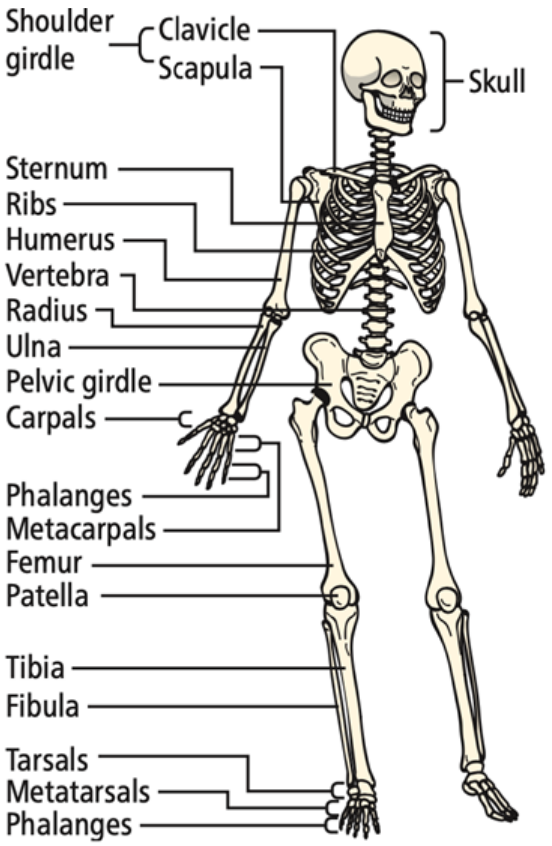

FIGURE 13.9

The human skeleton includes 206 bones (in adults) as well as a number of cartilages.

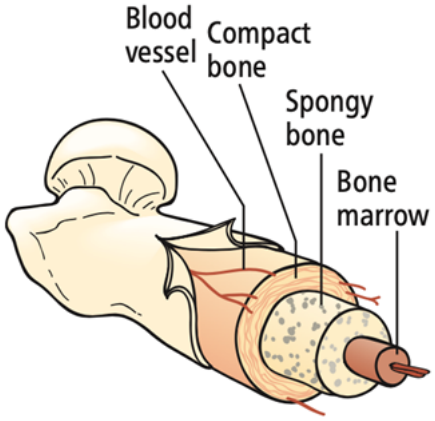

FIGURE 13.10
In bones, compact bone surrounds a layer of spongy bone, which surrounds the bone marrow.

Bones are made up of three layers. First, there is a strong, hard outer layer of *compact bone*. Compact bone surrounds a lighter layer of *spongy bone*. Spongy bone surrounds a jellylike substance called **bone marrow** (Figure 13.10). *Red bone marrow* makes red and white blood cells for the circulatory system. *Yellow bone marrow* stores fat. Like other parts of the body, bones are made of living cells. These cells secrete the hard calcium-containing matrix that gives bones both strength and flexibility.

READING CHECK

What are two functions of the skeleton?

CHECK YOUR ANSWER

To protect organs in the body, such as the brain, heart, and other internal organs, and to support and move the body.

You can read more about the human skeleton here:

https://www.livescience.com/22537-skeletal-system.html

And more about joints here:

https://www.visiblebody.com/learn/skeleton/joints-and-ligaments