

Living Bones

Do you know that babies have more bones than adult? Do you know that bones make blood cells? Do you know that bones are alive? Let's take a close look at our skeletal system and the surprises it holds.

The human skeletal system is made up of bones joined together by ligaments and joined to muscles by tendons. Bones are made of three layers, the outside skin of the bone, the hard compact bone, and the spongy bone marrow. The first layer of bone is the outside skin of the bone, which contains nerves and blood vessels and supplies the cells of the hard bone below with the needed nutrients. This skin layer of the bone is very sensitive. When a bone is broken, injured nerve fibers of the skin layer of the bone send pain messages to the brain.

Under the skin layer of the bone is the hard bone layer called the compact bone. It is shaped like a cylinder, a hard tube with a spongy center. This layer of the bone is so hard that doctors must use a saw to cut through it. It has thousands of tiny holes and passageways through which the nerves and blood vessels pass keeping the bone alive. This is also the layer that supports the body weight. It is made mostly of calcium and minerals.

Inside the compact bone layer is the marrow layer. This spongy layer contains a jelly-like material that is the marrow. The marrow of some bones produces red blood cells that carry nutrition to the other cells of the body. The marrow of different bones produces the infection fighting white blood cells. The marrow of still different bones produces platelets that allow blood to clot, which makes bleeding stop.

The human skeletal system has four main jobs it performs for our bodies. It gives support, protection, movement, and blood cells. The skeletal system is the body's support. It is the frame that gives the body size and shape. Without our skeletal system, our bodies would look like globs of JELL-O.

Many of our internal organs must be protected from injury. The skeletal system provides this protection. The cranium (skull) protects the brain. Ribs protect the lungs and heart. Hips protect many of the lower organs of the digestive system. Vertebra (backbone) protects the spinal cord.

The skeletal system works together with the muscular system to allow for body movement. Movement occurs at the point where two bones meet. This meeting point is called a joint. Some joints allow for movement, but many do not. The two main types of movable joints are hinge (knee, jaw, and elbow) and ball and socket (hip and shoulder). When babies are born, they have about 270 soft bones. As the bones harden, some of them fuse together at the joint making 206 hard permanent bones in adults.

The skeletal system also has the job of making blood cells. Various bones make red or white blood cells or platelets, all of which travel throughout the body bringing nutrition, fighting infection and aiding in blood clotting.

The skeletal system is more than just a group of bones. It works in many interesting ways to make our bodies strong and healthy.

Possible Implicit Questions
From the Article
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1. What shape does the skin layer of bone have? **Since we know the skin is the outer covering of the bone, it is implied that the skin is shaped like the bone it covers.**
2. Why do we need to eat a lot of calcium? **Since we know the compact bone layer is made mostly of calcium, it is implied that we need to eat calcium to maintain strong healthy bones.**
3. We hear on the news that some very ill people need marrow transplants. That means they will be getting marrow from other people. Why would sick people need marrow from others? **Since we know that marrow makes blood cells and platelets, needing marrow implies that the sick person's marrow isn't making enough blood cells or platelets to get well.**
4. Around your eyes are large circular bones. What is the job of this bone? **Since we know that one job of bones is to protect internal organs, it is implied that the bone around our eyes protect our eyeballs.**
5. What kind of joint is the jaw? **Since we know that the jaw only moves in one direction like the knee and elbow, we can imply that the jaw is a hinge joint like the knee.**
6. How many bones might a fourth grader have? **Since we know that babies have about 270 bones but some of them fuse together so that adults have only 206, it is implied that a fourth grader has between 270 and 206 bones.**
7. When we cut our fingers, how do we know that we will stop bleeding and not bleed to death? **Since we know that bone marrow is always making platelets that cause blood to clot, it is implied that these platelets will clot the blood in the cut and stop the bleeding.**

Living Bones Outline

I. Skeletal system parts

A. Bones

B. Ligaments

C. Cartilage

II. Layers of a bone

A. Outer skin

B. Compact bone

1. Cylinder

2. Hard

3. Made of calcium

4. Supports the body

C. Marrow

1. Red blood cells (carry nutrition)

2. White blood cells (fight infection)

3. Platelets (clots blood)

III. Jobs of skeletal system

A. Support

B. Protection

C. Movement

1. Joints

2. Fusing together as we grow

D. Make blood cells