

SECTION 2: THE SKELETAL SYSTEM

Introduction to the Musculoskeletal System:

From our head to our toes, our bones provide support for our bodies and help form our shape. The skull protects the brain and forms the shape of our face. The spinal cord, a pathway for messages between the brain and the body, is protected by the backbone, also called the spinal column. The ribs form a cage that shelters the heart, lungs, liver, and spleen; the pelvis helps protect the bladder, intestines, and other organs. Although they are very light, bones are strong enough to support our entire weight.

Joints occur where two bones meet. They make the skeleton flexible; without them movement would be impossible. Muscles are also necessary for movement. They are the masses of tough, elastic tissue that pull our bones to make us move.

Together, our bones, muscles, and joints, along with tendons, ligaments, and cartilage, form our musculoskeletal system and enable us to do everyday physical activities.

Words to Know: Words or phrases are listed here to provide you with definitions and/or pronunciations. If a definition is not listed here, it appears elsewhere in this section.

Arthritis (ar thry' tis): Arthritis is a disease where the synovial fluid at moving joints is thin and weak, making it painful to move the joints. Eventually, the bones undergo modifications, becoming larger to deal with the extra wear and tear. That further increases the pain associated with moving the joints.

Ball-and-Socket joints: Ball-and-Socket joints are what God used for your hips and shoulders. They offer a wide range of motion allowing multidirectional movement and rotation but are less stable than hinge joints.

Bone marrow (mar' oh)

Calcaneus (kal kay' nee us): The calcaneus is the heel bone and is also one of the tarsals.

Callus (kal' us): A callus is a bulge under the periosteum that is formed when osteoblasts make bone to fill in the bulge made from a blood clot after the bone is broken.

Cancellous bone (kan'sell us)

Carpals (kar' pulz): The carpals are the eight short bones in your wrist.

Cervical vertebrae (sur' vih kul): Cervical vertebrae are the 7 vertebrae in the back of your neck. They are called cervical vertebrae because 'cervical' refers to the neck.

Clavicles (klav' ih kuls): Clavicles are the bones right below your shoulders that lead inward towards to your throat. They are also known as collar bones.

Coxae: The coxae are your hip bones.

Cranium (kray' nee uhm): The cranium is the part of the skull that protects the brain. It is made up of eight bones that have fused together.

Digits: Another name for fingers is digits.

Ellipsoidal joints (ih lip' soyd uhl): Ellipsoidal joints, also called Condylod joints, are like flattened ball-and-socket joints. Ellipsoidal joints allow movement in two axes. Therefore, you can bend it, straighten it, move it from side to side, and rotate it. An example is your wrist joint.

Femur (fee' mur)

Fibula (fih' byuh luh)

Flat bone: Flat bones are strong, flat plates of bone with the main function of providing protection to the bodies vital organs and being a base for muscular attachment. The classic example of a flat bone is the scapula (shoulder blade). The sternum (breast bone), cranium (skull), coxa (hip bone), pelvis and ribs are also classified as flat bones. In adults, the highest numbers of red blood cells are created in flat bones.

Humerus (hyoo' muh rus)

Hinge joints: A hinge joint can move in the axis at a right angle to the joint involved. An example is the elbow joint, which connects the humerus and the ulna. Movements allowed by this joint include flexion (bending) and extension (straightening) of your elbow.

Incus (ing' kus)

Irregular bone: Irregular bones are bones in the body which do not fall into any other category due to their non-uniform shape. Good examples of these are the vertebrae, sacrum, and mandible (lower jaw). They primarily consist of cancellous bone with a thin outer layer of compact bone.

Ligament (lih' guh ment): Ligaments are tissues made up of tough collagen fibers that hold the bones at a joint in place.

Lipids (lip' idz): Lipids are fats.

Long bone: Long bones are some of the longest bones in the body, such as the femur, humerus, and tibia. They are also some of the smallest bones in the body, including the metacarpals, metatarsals, and phalanges. The classification of a long bone includes having a body which is longer than it is wide, with a growth plate (epiphyseal plate) at either or both ends, having a hard outer surface of compact bone, and a spongy inner known as cancellous bone containing bone marrow. Both ends of the bone are covered in hyaline cartilage to help protect the bone and aid shock absorption.

Lumbar vertebrae (lum' bar): Lumbar vertebrae are the 5 vertebrae in your lower back area. They are called lumbar vertebrae because 'lumbar' refers to the lower back.

Malnutrition (mal' new trish' uhn): Malnutrition is when a person does not get enough food and/or does not get the right kinds of nutrients.

Malleus (mal' ee us)

Metacarpals (met' uh kar' pulz): The metacarpals are the bones between your digits and your carpals.

Metatarsals (met' uh tar' sulz): The metatarsals are the bones in between your phalanges and your tarsals.

Minerals (min' ur uhlz): A mineral is a chemical substance that occurs naturally in certain foods and are important for good health. Some examples of minerals are iron, zinc, copper, magnesium, calcium, phosphorus, potassium, and selenium.

Osteoporosis (ahs' tee oh puh roh' sis): Osteoporosis is a disease caused by lack of calcium, which results in weak bones with lots of small holes in the bones.

Periosteum (pare ee os' tee um)

Pectoral girdle (pek' tur uhl): The pectoral girdle is a group of bones that connect your arms to your sternum.

Pelvic girdle: The pelvic girdle connects the spine to the legs. It contains the coxae, sacrum, and tail-bone.

Phalanges (fuh lan' jeez): Phalanges are the bones in your digits. There are three in each finger and two in the thumb. Your toe bones are also called phalanges.

Pivot joints: Pivot joints only allow rotation. One bone serves like a ring while the other bone has a rounded process rotating within the ring. This type is found in your neck, particularly in your first two cervical bones, and allows you to rotate your head.

Patella (puh tel' luh)

Radius (ray' dee us)

Resilient (rih zil' yent): To be resilient means to have the ability to expand back to its original shape after being compressed.

Rickets (rik' its): Rickets is a disease caused by a lack of vitamin D, which results in weak bones. People with rickets often have bowed leg bones.

Saddle joints: Saddle joints are what God used for your ankles. The range of motion is less than ball-and-socket joints but more than hinge joints.

Scapulae (skap' yuh lay): The scapulae are your two shoulder blade bones.

Sesamoid bone (seh' suh moyd): Sesamoid bones are usually short or irregular bones imbedded in a tendon. The most obvious example of this is the patella (knee cap), which sits between the patellar ligament and the quadriceps tendon. Other sesamoid bones are the pisiform (smallest of the carpals), and the two small bones at the base of the 1st metatarsal. Sesamoid bones are usually present in a tendon where it passes over a joint, which serves to protect the tendon.

Short bone: Short bones are defined as being approximately as wide as they are long and have a primary function of providing support and stability with little movement. Examples of short bones are the carpals and tarsals, also known as the wrist and foot bones. They consist of only a thin layer of compact, hard bone with cancellous bone on the inside along with relatively large amounts of bone marrow.

Sliding joints: Sliding joints are what God used to connect your vertebrae. They allow you to bend and twist your back.

Stapes (stay' peez)

Synovial fluid (sih noh' vee uhl): The synovial fluid is found in moving joints and lubricates them so they move more easily.

Tarsals (tar' sulz): The tarsals are the seven bones in between the lower leg and the metatarsals.

Talus (tal' iss): The talus is a large bone in the ankle.

Thoracic vertebrae (thu ras' ik): Thoracic vertebrae are the 12 vertebrae that are in the back of your chest area. They are called thoracic vertebrae because "thoracic" refers to the chest.

Tibia (tih' bee uh)

Ulna (ul' nuh)

Vertebrate (vur' tuh brayt): A vertebrate is an organism which has vertebrae.

Fascinating Facts about the Skeletal System God Created

Directions:

Some of the words are not on the writing lines so that you can practice writing them on your own. Where the words have been removed, the first letter of each line is there to help guide you.

1. Read the fact.
2. Trace the words and letters provided, and then write the rest of the fact on your own.
3. Make sure your letters are the same shapes and sizes as the examples.
4. Read the fact again.

God created your skeleton with a
framework of bones.

God created your skeleton with a
f

Together your bones and skeleton
provide an anchor for your muscles.

support your skin, give you form,
hold you up, help you move, make
blood cells, store and release
minerals and fats, and protect your
vital organs.

Together your bones and skeleton

p

s

h

b

m

w

An adult's skeleton has 206 bones.

An adult's skeleton has 206 bones.

Your bones began to develop before
birth as God knitted you in your
mother's womb.

Your bones began to develop before

b

m

When your skeleton first forms, it is made of flexible cartilage, but within a few weeks it begins the process of ossification.

When your skeleton first forms, it

i

w

p

Ossification is when the cartilage is replaced by hard deposits of calcium phosphate and stretchy collagen, the two main components of bone. It takes about 20 years for this process to be completed.

Ossification is when the cartilage is

r

r

p

t

t

t

A baby is born with about 300 bones. Some of these bones fuse together as babies grow older resulting in 206 adult bones.

A baby is born with about 300

b

t

r

The skeleton has two main parts: the axial skeleton and the