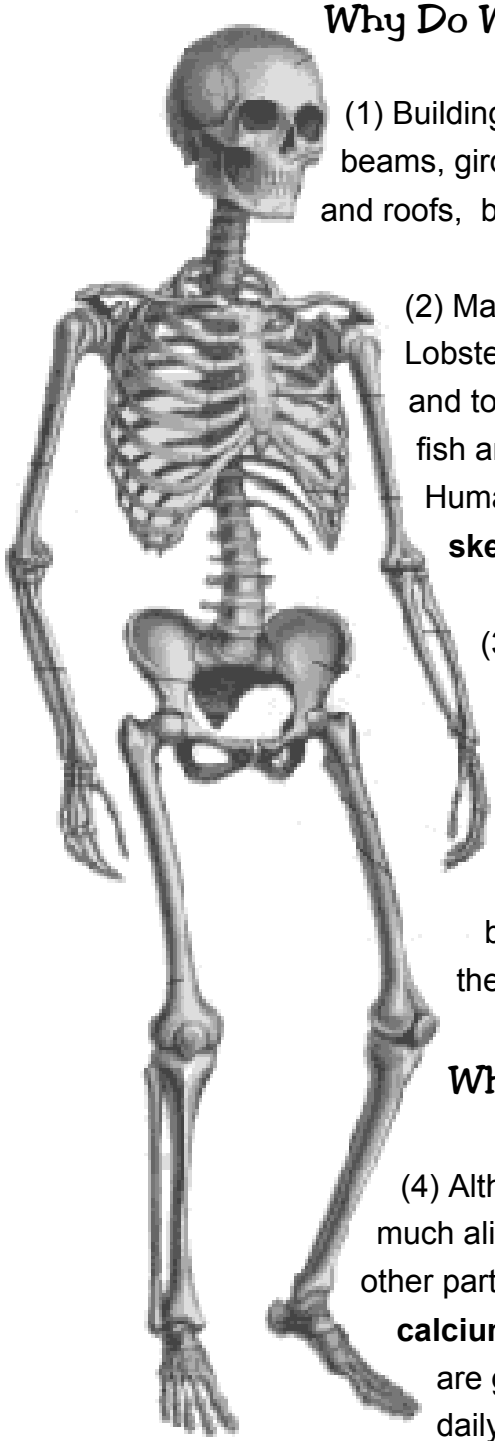
The Skeletal System

Why Do We Have a Skeleton?



(1) Buildings we **construct** must have **supports**. Without beams, girders and trusts to keep up the floors, walls, windows and roofs, buildings like our homes would **collapse**.

(2) Many living things have supporting structures too. Lobsters, for example, have outer shells to give them shape and to protect them from enemies. Mammals, birds, some fish and most reptiles have inner supporting structures. Humans do too. Made of **bone**, this structure is called a **skeleton**.

(3) An adult human skeleton has **206 bones** to support the fleshy parts of the body. With the help of muscles and ligaments which are attached to the bones, the skeleton enables us to move. The skeleton also protects important **internal** organs such as the heart, lungs, liver and kidneys. Without a skeleton, we would be like a jellyfish out of water, just a **immobile** lump on the ground.

What Are Our Bones Like?

(4) Although they look like they are dead, bones are very much alive. They are growing and changing all the time, like other parts of your body. The building blocks of these bones is **calcium**. Milk and milk products such as cheese and yogurt are good sources of calcium and should be part of our daily diet. The bones are hallow in the middle and contain marrow which makes the blood cells important for fighting diseases.

How Bones Grow

(5) When we were babies, we all had tiny heads, feet, and hands! In fact, everything about us was tiny. Slowly, as we grew older, everything became a bit larger. Our bones were no **exception**.

(6) When a baby is born, its body contains 300 bones. Most of these are not hard and sturdy like the bones in an adult skeleton. Baby bones are made of a special material called **cartilage.** It is soft and **flexible**. Your earlobes and nose are made of cartilage. Over the course of childhood, the cartilage-like bones slowly hard. During **puberty** some bones start to grow together to produce the 206 adult skeleton.

(7) It is not until people reach between 17 and 21 years of age that the cartilage has completely hardened into bone. Once completed, there can be no more growth. The bones are as big as they will ever be.

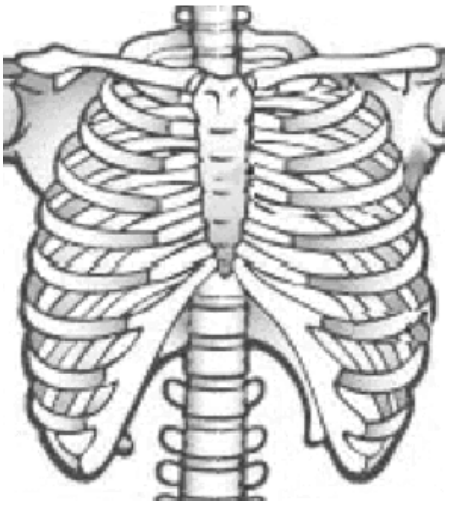
The Spine

(8) Your spine runs the full length of your back. It allows you to twist and bend and it holds your body upright. It also provides protection for the **spinal cord**, a large bundle of nerves that helps to **transmit** information from your brain to the rest of your body. The spine is special because it isn't made of one or even two bones: it's made of 33 bones in all! These bones are called **vertebrae** (say: **vurt**-uh-bray). Each one is shaped like a ring.

(9) In between each vertebra (the name for just one of these spinal bones) are small cookie shaped **disks** made of cartilage. These disks keep the vertebrae from rubbing against one

another. They also act as your spine's natural **shock absorbers**. When you jump, these disks provide the **cushioning** your vertebrae need to support the force placed on them when you land. Without these disks, movement of any kind would be extremely painful.

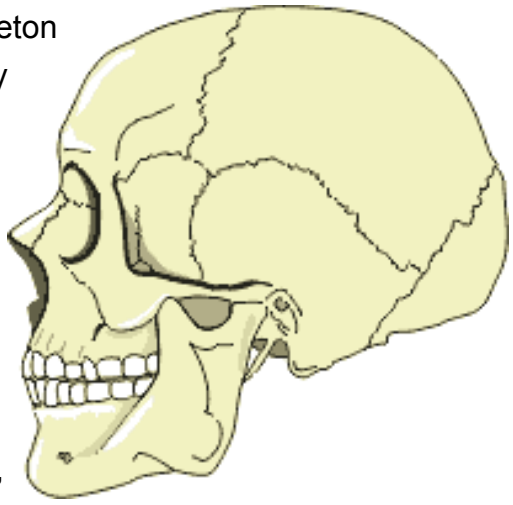
The Ribs



(10) Your heart, lungs, kidneys and liver are all vital organs. Your could not live without them. Protecting them are the ribs. Ribs look and act like a cage and form the chest portion of our bodies. It's easy to feel this cage. Simply run your fingers along the sides and front of your body.

(11) Ribs come in pairs. The left and right sides of each pair are **identical**. Most people have 12 pairs of ribs, but about 5% of people are born with one or more extra.

The Skull

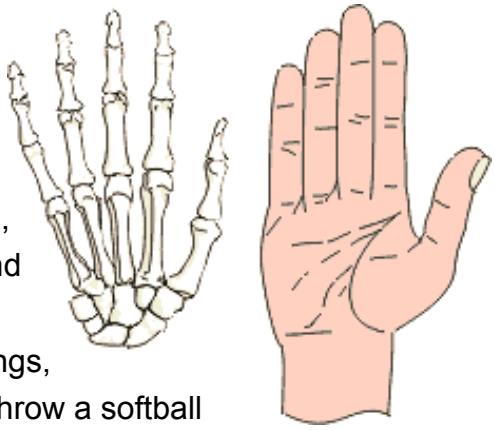


(12) The skull is the part of your skeleton that protects the most important body part of all, the brain.

(13) Although it might look like one ball shaped hallow bone, the skull is actually made up of 30 different separate bones. Some of these bones protect your brain, while others make up the structure of your face. If you touch beneath your eyes, you can feel the ridge of the bone

that forms the hole where your eye sits. Just below, you can feel the cheek bones which help give our faces their distinct look. And while you can't see it, the smallest bone in your whole body is located not too far away: the stirrup bone behind your eardrum is only 2.6-3.4 millimetres long! Even though you might be able to bat your eyes or wiggle your ears, the only part of your skull that can truly move is your lower jawbone. Muscles open and close it to enable you to talk and chew food.

The Hand

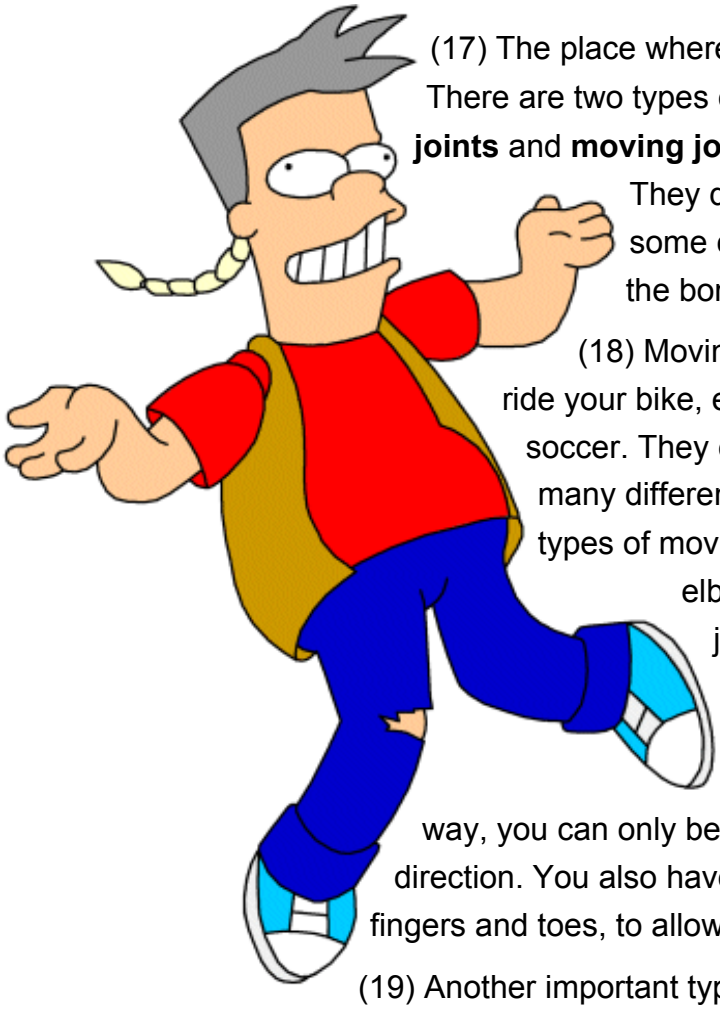


(14) The centre part of your hand contain five **separate** bones. Each finger on your hand has three bones, except for your thumb, which has two. Between both your wrists, hands, and all your fingers, you've got a grand total of 54 bones. With the help of muscles they enable you to grasp things, write your name, pick up the phone, throw a softball and complete millions of other tasks!

(15) The **ankle** is a bit different from the wrist; it has three larger bones and four smaller ones. But the main part of the foot is very similar to the hand, with five bones too. Each toe has three tiny bones, except for your big toe, which like the thumb, has just two. This brings the bone total in both feet and ankles to 52!

(16) Most people don't use their toes and feet for grabbing things or writing, but they do use them for two very important things: standing and walking. Without all the bones of the foot working together and a little gravity from earth and friction between your feet and the floor it would be impossible to **balance** properly.

The Joints



(17) The place where two bones meet is called a **joint**. There are two types of joints in every person's body: **fixed joints** and **moving joints**. Fixed joints are fixed in place. They don't move at all. Your skull contains some of these joints. They **fuse** or cement the bones of the skull together.

(18) Moving joints are the ones that allow you to ride your bike, eat pizza, climb a tree, and play soccer. They enable you to twist, bend, and move many different parts of your body. One of the main types of moving joints is called a **hinge** joint. Your elbows and knees each have a hinge joint, which let you bend and then straighten your arms and legs. These joints are like the hinges on a door; just as most doors can only open one way, you can only bend your arms and legs in one direction. You also have many smaller hinge joints in your fingers and toes, to allow them to bend.

(19) Another important type of moving joint is the **ball and socket** joint. These joints are at your **shoulders** and hips. One of the bones in the joint is rounded at the end and fits into a small cuplike area of the second bone in the joint. Ball and socket joints allow for lots of movement in every direction.

Keeping the Joints Well Oiled

(20) In all of the machines we have created, moving parts that are in contact need to be **lubricated** to help them move easily and to reduce wear. Joints come well lubricated too. They have their own special fluid that to help them move freely. There is also some cartilage between ones that are in contact with one another that helps the bones move smoothly.

The Skeletal System Worksheet

Complete the following.

Quickfacts (Read carefully!)

a. The number of bones in an adult human skeleton . . . . . _____

b. Number of bones in each hand . . . . . _____

c. Number of bones in each foot . . . . . _____

d. Age range at which bones are fully developed . . . . . _____

e. Number of vertebrae in the spine . . . . . _____

f. Number of ribs in most people . . . . . _____

g. Number of bones in the skull . . . . . _____

h. The finger with only two bones . . . . . _____

i. The toe with only two bones . . . . . _____

j. The difference in the number of bones in a baby skeleton and an adult skeleton . . . . . _____

Long Answer Questions

Answer the following in your science exercise book. Use cursive writing.

1. Write a definition for each of the following terms: skeleton, cartilage, spinal cord, vertebrae.
2. What purpose does the skeleton serve?
3. What purpose does cartilage serve?
4. What is the difference between a hinge joint and a ball and socket joint?

Vocabulary

Find the word in bold print in the passage that matches the following meanings.

a. Inside the body . . . . . _____

b. Nutrient in food important in bone growth . . . . . _____

c. Able to be bent easily . . . . . _____

d. Age at which a child's body begins the change to adulthood . . . . . _____

e. To move signals from one place to another . . . . . _____

f. Exactly alike . . . . . _____

g. Greased or oiled to reduce friction . . . . . _____

h. Fall down or fall apart . . . . . _____