

Broken Bones

It happened so fast. A skid. A swerve and he was sailing through the air over the handlebars. A heavy thud on the hard ground followed by a loud groan and the damage was done. Sean had broken something. Lucky for him, his mum was nearby and could help him home.

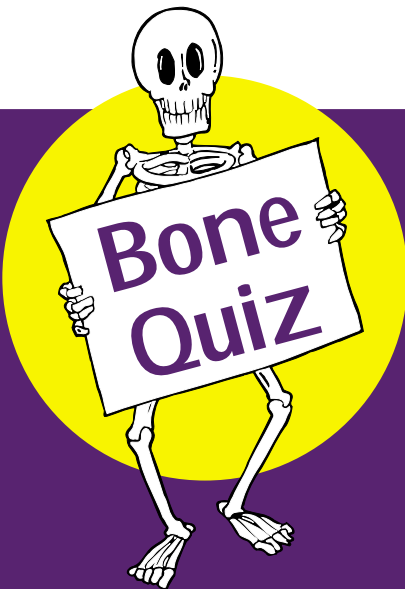
Later on in the hospital the doctor examined his leg carefully. 'You will need an X-ray' said the doctor. She explained

to Sean that the X-ray machine is like a camera but instead of light it uses X-rays which can detect even the tiniest break or chipped bone. Sean's lower leg was broken.

The doctor carefully set the bone in place and soft bandage was wrapped around his leg. A hard cast made from plaster of paris was then put on his leg. This kept Sean's bones in one position for a few weeks to give them time to mend.



Inside the cast, Sean's broken bones are growing and will mend the break.



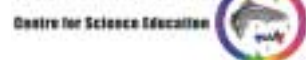
1. If a giraffe has 7 bones in its neck, how many has a human?
2. What helps our bones to move?
3. What type of joint would you find at your elbow?
4. If your thigh bone is 30 cm long predict how tall you might be?
5. Where are your blood cells made?
6. What mineral do you need to keep your bones strong and healthy?
7. What do you call an animal that has no backbone?

Answers to Bone Quiz.
 1. Seven. 2. Muscles. 3. Hinge joint. 4. 120cm.
 5. Bone marrow. 6. Calcium. 7. An invertebrate.

Answers to Skeleton Quiz.
 A. Skull. B. Jaw bone. C. Collar bone. D. Ribs.
 E. Thigh bone. F. Knee cap. G. Hip bones. H. Spine.

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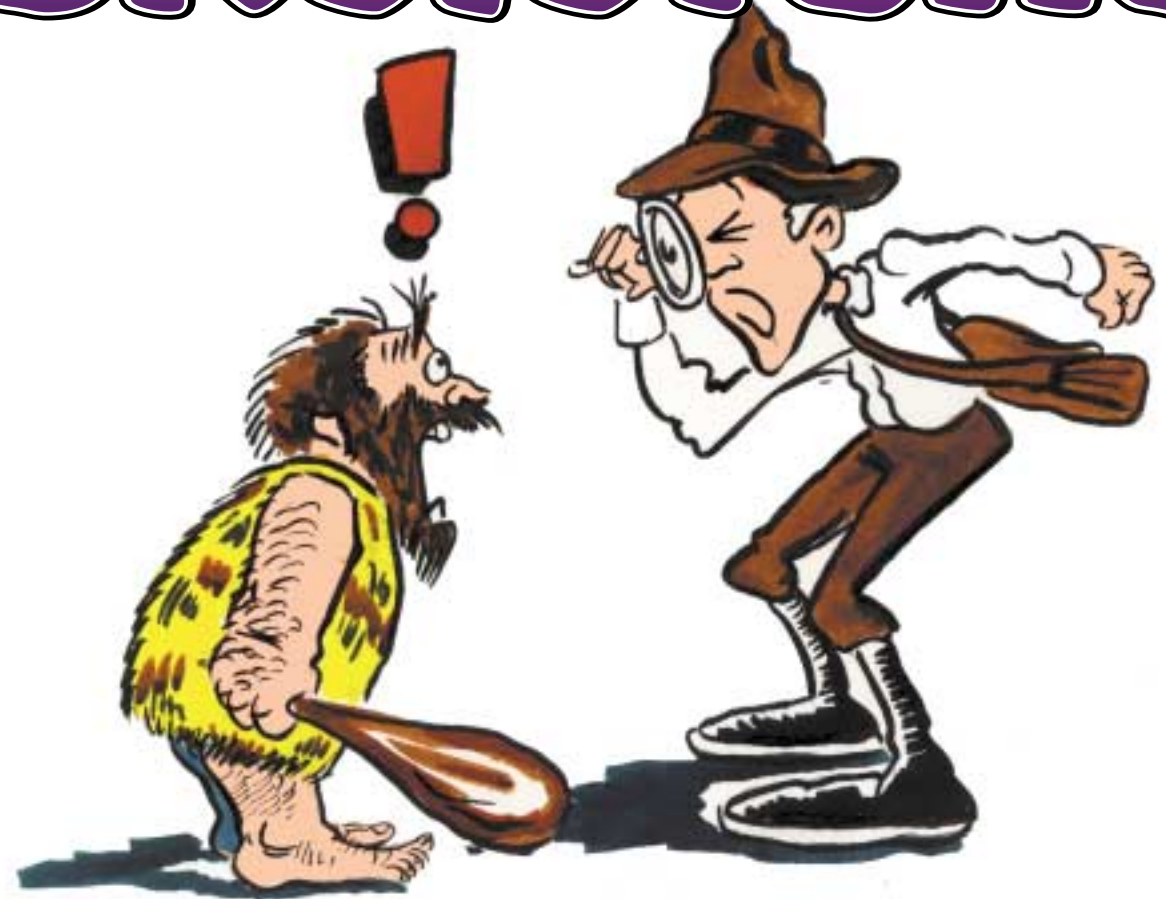
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Skeletons



Have we met? Have I seen you somewhere before? Your face is familiar

The Story of Lucy

On 24th November 1974 two scientists called Donald Johanson and Tom Gray were out in their landrover in Ethiopia. After a long, hot morning's work they decided to take a different route back to their landrover. As they were walking, Johanson spotted a bone in the dirt. It was an arm bone from the skeleton of a very, very, old type of

human that had not been discovered before. Eventually they dug up a skull, leg bone, ribs, hip bones and lower jaw. In fact after a careful search 40 percent of a skeleton was found.

Johanson and Gray were thrilled with their discovery and celebrated their find with a party for all their friends. During the party they kept playing a song from one of their favourite pop groups - the Beatles - called

'Lucy in the sky with diamonds'. Because of this, the skeleton was named Lucy.

From Lucy's 3.18 million year old skeleton **anthropologists** are learning more about our ancestors. An anthropologist is a person who studies humans and how the modern human has developed from early man. Before Lucy was discovered, scientists were not sure if early humans walked on four limbs like gorillas or if they walked upright.

By examining Lucy's bones anthropologists could tell how she moved. Her knee and ankle joints were quite similar to humans. This suggested that Lucy walked upright. Her spine and hip bones also suggested that she walked on two legs.

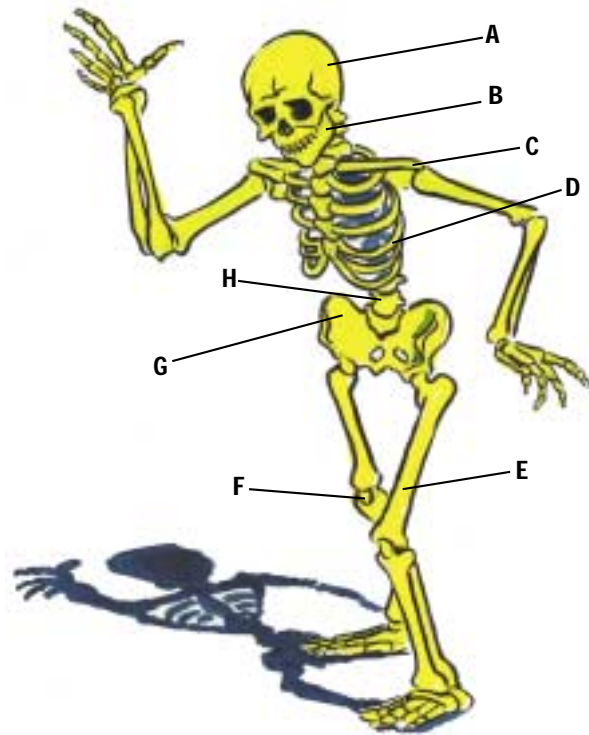
Lucy's skeleton is stored in a special safe in a museum in Addis Ababa, Ethiopia. Models have been made of each bone so scientists can continue to study them.

Zone in on bones

As Hallowe'en approaches skeletons can be seen everywhere - in the shops, in people's houses and on Hallowe'en night walking the streets. Don't be scared! Your skeleton is just a body without all the blood and guts.

Your skeleton is a very important part of your body. Your bones give you a

shape. Without your skeleton you would not be able to move. Some parts of your skeleton provide a safe place in which to store your body organs. **The skull protects the brain, the ribs act as a cage around our heart and lungs and the backbone protects the spinal cord.** Take a look at this skeleton. How many bones can you name?



Bone list

Can you match these bones with the letters?

- | | | |
|-----------------|------------------|-------------------|
| Knee cap | Spine | Jaw bone |
| Hip bones | Thigh bone | Collar bone |
| Skull | Ribs | |

Answers on back page.

The gory inside story

Did you ever watch a dog trying to gnaw at the inside of a bone? Some bones are hollow in the middle. They are filled with red jelly stuff called **marrow**. This is what the dog is after. Your body makes its **blood cells** in the bone marrow. In fact 173 billion blood cells are made by your bone marrow every day!



Get a move on lazy bones



How do we get our bones to move? Muscles are attached to our bones. When they **contract** they get shorter, causing the bones to move. See what happens to your muscles when you bend your arm at the elbow. You should find that the muscle on your upper arm gets shorter and fatter.

Bones are linked together at joints. Joints come in different designs

Hinge joints like the knee work like a door hinge. They move backwards and forwards but not side to side. Can you think of another hinge joint in your body?

Gliding joints in the ankle can move from side to side as well as up and down.

Ball and socket joints are found in our shoulders and hips. They allow the bones to move in most directions.

A **pivot joint** is found in your neck. It allows you to twist and turn your head.

Strong strings called **ligaments** hold your bones together at the joint. Good thing too, otherwise your leg would fall off every time you tried to kick a ball. Not a pretty sight!

Fascinating facts

- ◆ A child has more bones than an adult. Young children have 350 bones. As they grow some of these bones join together and by the time you become an adult you have only 206 bones.
- ◆ It is possible to have more than 206 bones. Some people are born with an extra set of ribs and a few people even have extra fingers and toes!
- ◆ The largest bone in the human body is the thighbone and the smallest is in the ear.
- ◆ You can predict a person's height by multiplying the length of their thighbone by 4. Try it!
- ◆ When a bone breaks it can repair itself. A doctor sets the broken ends and new bone grows over the break.
- ◆ Who has more bones in their neck - you or a giraffe? In fact your neck has the same number of bones as a giraffe. Their bones are just longer!
- ◆ If you had no bones in your body you would look like a wobbly puddle of guts and skin and you would find it very difficult to move.
- ◆ Two hundred years ago wooden furniture was stuck together using glue made from animal bones. Bones were ground up into powder and then dissolved in water.



Giraffes have some neck! But the same number of bones as us.

Dem bones dem bones need calcium and exercise too

All of us need to think about keeping our bones strong and healthy. Getting enough calcium in our diet will ensure this. Drinking milk is the best way to make sure you get enough calcium.

Unfortunately Ms Bones here really hates milk to drink but she does like cheese and yoghurt which of course are made from milk. See if you can find out what other foods she can eat to keep her bones strong and healthy.



Calcium helps us to build strong bones and teeth

To keep joints flexible they need to be moved regularly. It is good to do some stretching to warm up before exercise. **Weight-bearing** exercises like walking, jogging, dancing and football make your bones stronger by building more cells. They are called weight-bearing exercises because you are on your feet all the time, carrying your weight. Try to exercise your bones at least 4 times a week and your body will thank you for it when you are older!

Activity

Try keeping an exercise diary for a week. Don't forget to include times when you walk to school or the shops.



Activity

Take away the calcium

Now that you have read all about how to keep your bones strong and healthy, think about what would happen if you had too little calcium in your diet. Try this activity and find out. Eggshells are used instead of bones. They have a lot of calcium in them too. Vinegar is used in this experiment to remove calcium from the eggshells.

MATERIALS

- 2 Small bowls per group
- Vinegar
- water
- large pieces of egg shell
- cling film

INSTRUCTIONS

1. Put some eggshell pieces into each bowl.
2. Pour vinegar into 1 bowl and water into the other. Make sure the eggshells are completely covered. Cover the bowls with cling film because the smell will be strong.
3. After 2 - 3 days remove the eggshells and rinse off the vinegar.
4. Compare the shells soaked in vinegar with the ones soaked in water. What do you notice?
5. What does tell you about not having enough calcium in your diet?

Safety: Do not get vinegar in your eyes. Rinse well with water if you do.



Activity

Design and make a skeleton Hallowe'en costume



HERE ARE SOME MATERIALS YOU COULD USE

- Black fabric
- Black paper
- Glue
- Stapler
- Glitter glue
- Old black clothes
- White card
- Scissors
- Fluorescent card

INSTRUCTIONS

- Plan and make what you are going to wear as a black background for your skeleton body. Make sure you can move easily in it. Now think about where you can find skeleton pictures. These will help you to get the bones in the correct place.
- Sketch the bones on the card and then cut them out. Stick them on to the black background.
- You could make a skeleton face using a mask or face paints.

THINGS TO THINK ABOUT: Will your costume have a back and front?

Did you know?

There's one bone in your body that you can never break. It's your funny bone. The reason is because it is not really a bone at all. The funny feeling you sometimes get when you bump your elbow is because you have hit a nerve.



Bones on the outside

Not all creatures have a skeleton on the inside like us. We have a backbone and are called **vertebrates**. Animals who have no backbone are called **invertebrates**. They may have a hard skeleton on the outside instead. Crabs and lobsters have skeletons like this.

