



**Biology**

1 **Work with a partner. Look at the photo and discuss the questions.**

- 1 What does the photo show?
- 2 Point to these things in the photo: bone, joint, muscle.

2 **Quickly read the text. What are the main function of bones, joints and muscles?**

# Skeletal and muscular systems

## The skeleton

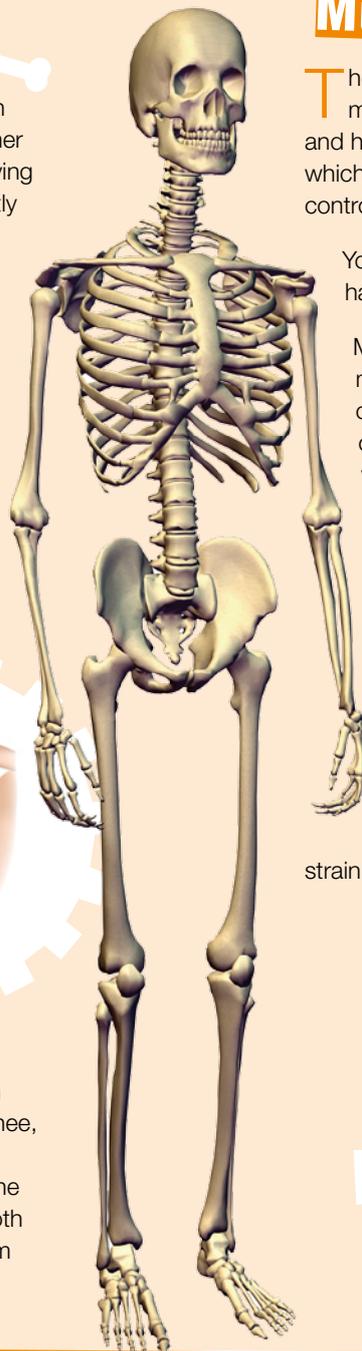
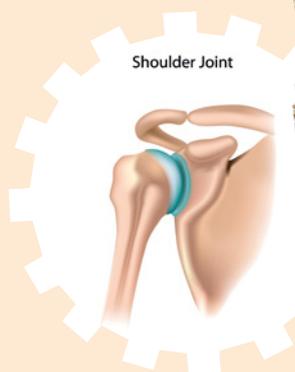
There are more than 200 bones in the human skeleton. They are made of calcium and other minerals and are strong but flexible. Bone is a living tissue with a blood supply. Our body is constantly forming bone tissue, and if we break a bone, the body will repair it.

The skeleton is the framework for the body. It supports the body and protects the vital organs, for example, the ribs protect our heart and lungs. Our bones also have another important job: to make blood cells in the bone marrow. They produce approximately 500 billion blood cells every day.

## Joints

Some of our bones are joined together and can't move, for example, in the skull. Others are flexible and can move. These are attached by joints and we use our muscles to move them.

There are two kinds of joints: a hinge joint which opens and closes like a door, for example the knee, and a ball and socket joint which can rotate, for example the shoulder. Strong ligaments inside the joints join the two bones and cartilage is a smooth tissue at the end of the bones, which stops them rubbing together.



## Muscles

The body has two kinds of muscles: voluntary muscles which are attached to the skeleton and help the body move and involuntary muscles which operate the internal organs and cannot be controlled.

Your heart is one of the most hard-working muscles in the body!



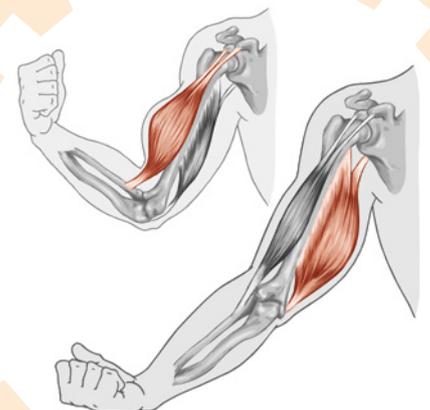
Muscles contract when they work; this means they become shorter. When a muscle contracts to create movement, it's an isotonic contraction. When a muscle contracts without creating movement, it's an isometric contraction.

Pairs of muscles that create movement are called antagonistic. One muscle contracts and the other relaxes. For example, the biceps and triceps muscles in the arm.

Regular indoor and outdoor exercise tones our muscles and makes them strong.

When we use our muscles regularly, they increase in size and help with our posture.

Good posture prevents injury and reduces strain on muscles, tendons and ligaments.



**3 Read the text again. Decide if the statements are True (T) or False (F).**

- 1 Bone is hard rigid tissue that makes up the skeleton. T / F
- 2 Bone is dead tissue. T / F
- 3 Our bone marrow is in our joints. T / F
- 4 Muscles helps our bones to move. T / F
- 5 An isotonic muscle contraction creates movement. T / F
- 6 Antagonistic muscles can't move. T / F

**4 Read the sentences. What do they refer to? Write bones (B), joints (J) or muscles (M).**

- 1 They allow us to move. ....
- 2 Our body makes this tissue all the time. ....
- 3 They can bend or rotate. ....
- 4 They protect our organs. ....
- 5 They become shorter when they contract. ....
- 6 They make red blood cells. ....
- 7 They contain a strong material. ....
- 8 We can't control some of them. ....

**5 Work with a partner and discuss the questions.**

- 1 What exercise or sports do you do?
- 2 How do you think these sports can help the body: swimming, tennis, running?
- 3 What other things can we do to help our bones, joints and muscles?

**?? DID YOU KNOW?**

When a human baby is born, it has 270 bones. This number reduces to around 206 bones when the baby becomes an adult, as some of the bones join together.

**PROJECT**

- 1 Work in groups. Choose one of these parts of the body:

the heart • hands • red blood cells  
the lungs • teeth

- 2 Find out how the part of the body works.

What is it made of?  
What is its function?  
How does it work?

- 3 In your group, prepare a presentation of the part of the body for the class. Find or create diagrams and pictures to explain.

**VOCABULARY FOCUS**

- blood [n]:** the red liquid that flows inside the body
- blood cell [n]:** a small part in the blood that carries oxygen
- bone marrow [n]:** a soft red substance inside the bones
- calcium [n]:** a white chemical that is an important part of bones and teeth
- framework [n]:** a structure that supports something and makes it a particular shape
- hinge [n]:** an object that fastens to a door and allows it to open and shut
- increase [v]:** to become larger in amount or number
- involuntary [adj]:** something you do that you cannot control
- organ [n]:** a part of your body that does a specific job, such as the heart or lungs
- posture [n]:** the position that your body is in when you sit, stand or walk
- protect [v]:** to keep someone or something safe from harm or injury
- repair [v]:** to fix something that is broken or damaged
- rotate [v]:** to move something in a circle around a fixed point
- skeleton [n]:** the set of bones that supports a human or animal body
- skull [n]:** the bones of the head
- socket [n]:** a curved space in the human body where a moving part such as a bone fits
- strain [n]:** injury, damage or stress
- support [v]:** to hold the weight of something
- tissue [n]:** the substance that animal and plant cells are made of
- tone [v]:** to make your body and muscles strong and healthy
- voluntary [adj]:** something you do that you choose to do