

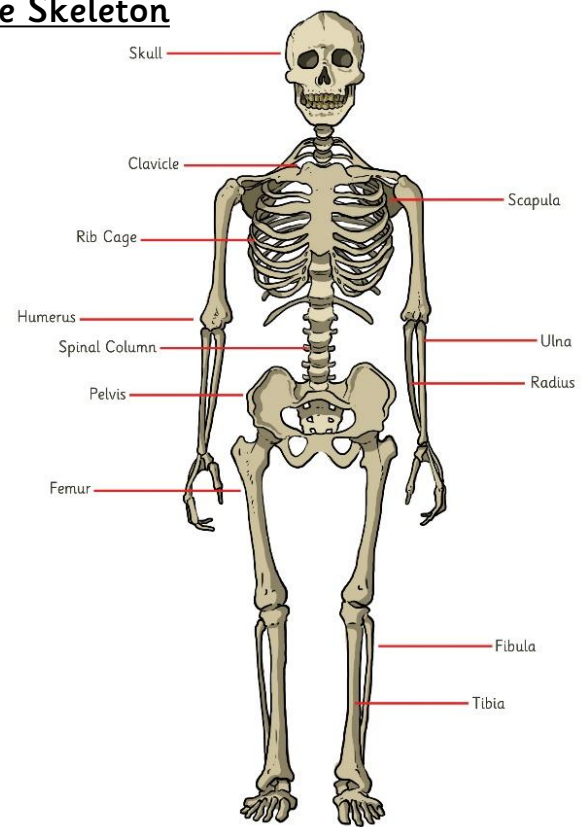
Human Muscles and the Skeleton

Bones are **rigid** and strong and make up the frame for your body called the skeleton.

When you are fully grown, your adult skeleton has 206 bones.

In a living person bones are not hard and **brittle**. They have blood vessels that run through them and are actually quite soft. Your skeleton and bones give your body its shape, support your body, move your body with the help of your muscles, protect your **organs** and it **releases** minerals like calcium as well as making blood cells in the bone marrow.

All of the bones in your body have special names such as the skull, the ribs, the spine, the sternum, the pelvis and the femur.



What does the skeleton do?

The skeleton has four main jobs:

- To support the body. For example, without a backbone we would not be able to stand upright.
- To help the body move. Some bones in the skeleton are joined together and cannot move against each other. Other bones are joined to each other by **flexible** joints.
- To protect some of the **vital** organs of the body, the skull protects the brain, the ribcage protects the heart and lungs and the backbone protects the spine.
- To make blood cells. Red and white blood cells are made in the bone marrow. This is soft tissue contained inside our larger bones which is **protected** by the hard part of the bone which surrounds it.

Types of bones

Bones come in all different shapes and sizes. We can **classify** them in the following ways:

- Flat bones – bones like those in the skull
- Sesamoid bones – these look like sesame seeds, for example the patella in the knee
- Long bones – bones like those in our **limbs**
- Short bones – bones like those in our foot and wrist

Muscles

Muscles move you. Without them you couldn't move anything inside or outside of your body. How many muscles do you think there are in your body? There are over 650 and they make up nearly half of your body weight.

Muscles are all made of the same material: a type of elastic tissue (almost like the material in a rubber band). Thousands, or even tens of thousands of small **fibres** make up each muscle.



How do muscles move?

The cells that make up muscles **contract** and then relax back to their original size. You have two sets of muscles connected to many of your bones which allow them to move. They work in pairs. To bend your arm, one muscle gets shorter and fatter. It pulls on the bone in the lower arm to which it is attached. At the same time, the other muscles relaxes, getting longer and thinner.

To move the arm back to where it started, the **opposite** happens. The relaxed muscle contracts and the other muscle relaxes.

Types of muscles

Did you know that you have three different types of muscles in your body?

- Skeletal muscle – attached to the skeleton and helps you to move
- Cardiac muscle – heart muscles
- Smooth muscle – found inside organs

Some muscles are known as '**voluntary**'. They only work when you tell them to. Examples of voluntary movements include clapping your hands or lifting your leg. Other contracting muscles are '**automatic**'. These include the contracting of your heart and blinking your eyes. Through signals from your nerves and, in some cases, your brain.

The different muscles around your body all have different jobs:

- Shoulder muscles raise and lower the arms.
- Stomach muscles move the chest and help with breathing.
- Leg muscles pull the heel up and point the toes.
- Biceps bend the arm and triceps straighten the arm.
- Neck muscles hold the head up and move it in all directions.

Human Muscles and the Skeleton – Oral Teacher Questions

Give two functions of the human skeleton. (AF2) **Answers could include: giving your body its shape; supporting your body; moving your body with the help of muscles; protecting your organs or releasing minerals.**

Give three names of bones in the human body. (AF2) **Answers could include: the skull, the spine, the ribs, the sternum, the femur or the pelvis.**

Which of your organs do you think the ribcage protects? (AF2) **The ribcage protects the heart and the lungs.**

Where does the word 'sesamoid' come from when describing bones? (AF2) **These bones look like sesame seeds, for example the patella in the knee.**

Why do you think the writer has chosen to ask a range of questions throughout the text? (AF5) **The writer asks questions to engage the reader and to get them to think more deeply about the subject.**

The writer uses sub-headings throughout the text. Can you think of a suitable sub-heading for the first section of the text? (AF4) **Suggestions may include 'The Skeleton' or 'Functions of the Skeleton'.**

Why has the writer chosen to include a labelled diagram of the human skeleton at the beginning of the text? (AF4) **The diagram shows the reader the main bones in the human body and their locations which helps the reader understand the text more clearly.**

The text is organised into clear sections with sub-headings. Why do you think the writer has chosen to do this? (AF4) **By organising the text into sections, it makes it clear what each section is about. It helps the reader to understand the text more easily and find the information they need more quickly.**

In your own words, can you explain how muscles work in pairs to move your limbs? (AF2) **To move your limbs one muscle gets shorter and fatter. It pulls on the bone in the lower arm to which it is attached. At the same time, the other muscles relaxes, getting longer and thinner.**

In the text, some muscles are described as 'automatic'. What does this mean? (AF3) **It means that signals in the brain tell your body to move certain muscles automatically without having to think about it first, for example breathing and blinking.**

Which muscles would you need to move to bend and straighten your arm? (AF2) **The biceps and triceps.**

Do you think humans would be able to survive without muscles and bones? Explain your answer. (AF2/AF7) **Without muscles and bones, your body would have no structure and your vital organs would not be protected. Your body would also be unable to move to complete essential tasks for survival such as breathing and eating.**

Why do you think it is important for athletes to have strong muscles and bones? (AF3/AF7) **Athletes need to have strong muscles and bones to enable to compete in their sport the best that they can. Athletes need to take care of their muscles and bones by ensuring they eat healthily and take care of themselves, as well as warming up and stretching to avoid injuries.**

Human Muscles and the Skeleton – Follow-Up Work

Give two functions of the human skeleton. (AF2)

Give three names of bones in the human body. (AF2)

Which of your organs do you think the ribcage protects? (AF2)

Where does the word 'sesamoid' come from when describing bones? (AF2)

Why do you think the writer has chosen to ask a range of questions throughout the text? (AF5)

The writer uses sub-headings throughout the text. Can you think of a suitable sub-heading for the first section of the text? (AF4)

Why has the writer chosen to include a labelled diagram of the human skeleton at the start of the text? (AF4)

classroomsecrets.com

The text is organised into clear sections with sub-headings. Why do you think the writer has chosen to do this? (AF4)

In your own words, can you explain how muscles work in pairs to move your limbs? (AF2)

In the text, some muscles are described as ‘automatic’. What does this mean? (AF3)

Which muscles would you need to move to bend and straighten your arm? (AF2)

Do you think humans would be able to survive without muscles and bones? Explain your answer. (AF2/AF7)

Why do you think it is important for athletes to have strong muscles and bones? (AF3/AF7)
