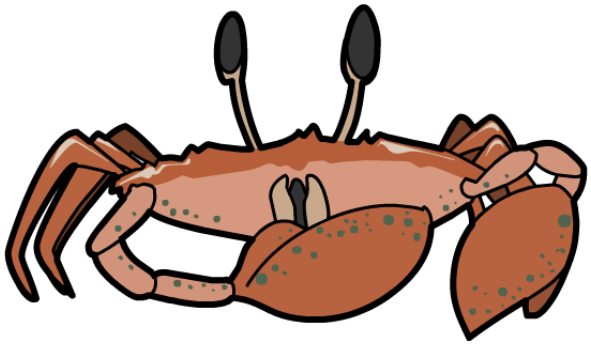
The Skeleton

What type of skeleton?

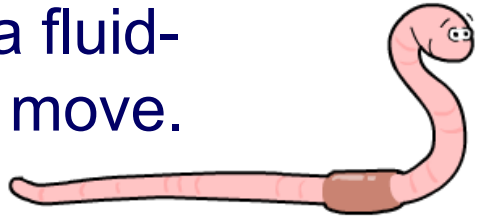
Different animals have different types of skeletons:

- Vertebrates have an **internal skeleton**. This is called an **endoskeleton**.

- Some invertebrates, such as arthropods, have an **external skeleton**. This is called an **exoskeleton**.



- Some invertebrates, such as worms, have a soft **hydrostatic skeleton** that consists of a fluid-filled cavity, which allows the animal to move.



Endoskeletons

An endoskeleton is an internal framework of rigid structures. In most vertebrates the endoskeleton is made up of bone, with some cartilage.

Cartilage is a type of flexible connective tissue. Humans have cartilage in the outer ear, trachea, nose and at the end of long bones.

Some fish have an internal skeleton that consists only of cartilage, e.g. shark and rays.

Why have a skeleton?

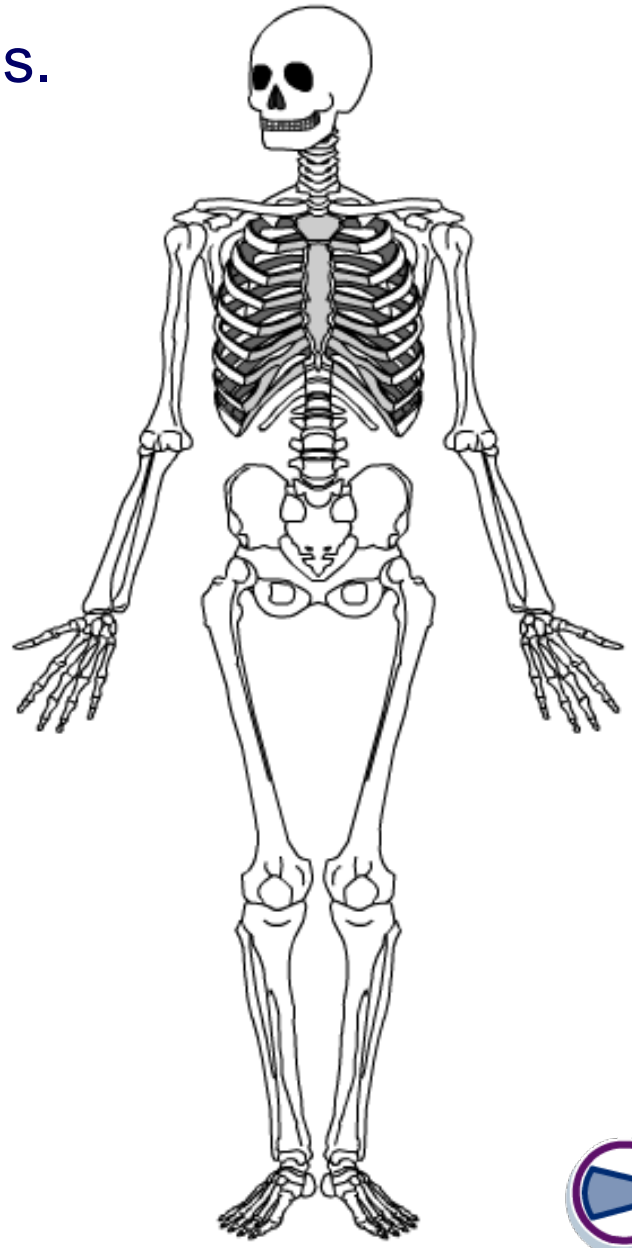
The human skeleton has many functions.

Protection – It protects delicate parts of the body, such as the brain and lungs.

Shape – It gives us our shape and determines our size.

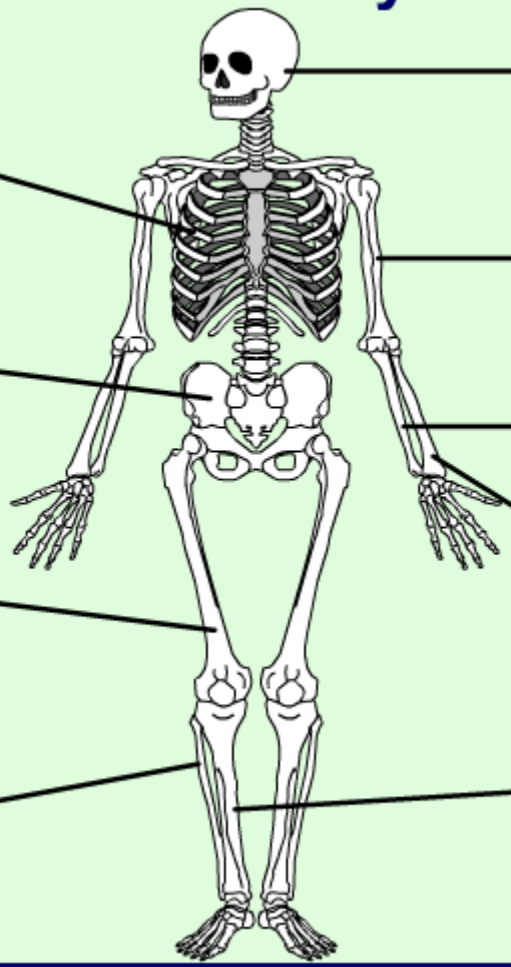
Support – It supports muscles and organs.

Movement – Muscles are attached to the bones and move them as levers.



Identifying bones in the human skeleton

Which bones can you name?



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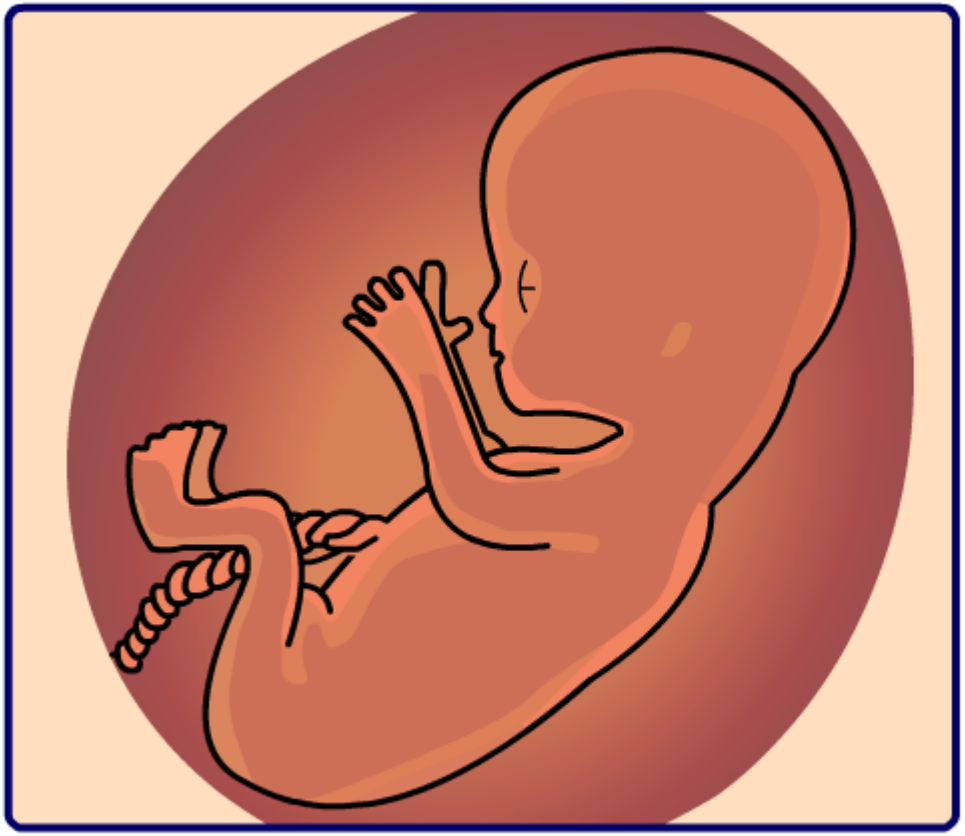
Bone growth

How do our bones grow?

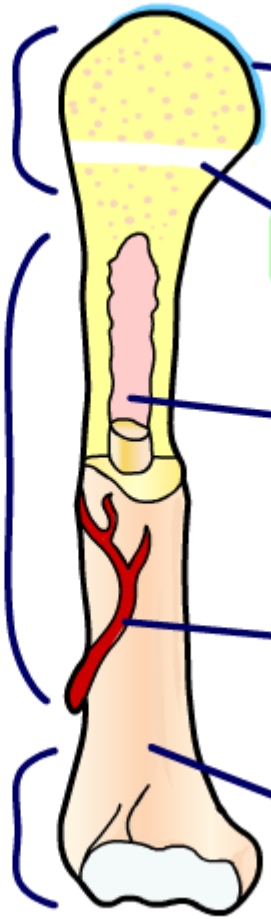
During growth, the bones in the skeleton become larger and develop into hard bone.

Click "**play**" to find how this happens.



Parts of a long bone

What are the different parts of a bone?



epiphysis

diaphysis

epiphysis

cartilage

epiphyseal line

medullary cavity

artery

periosteum

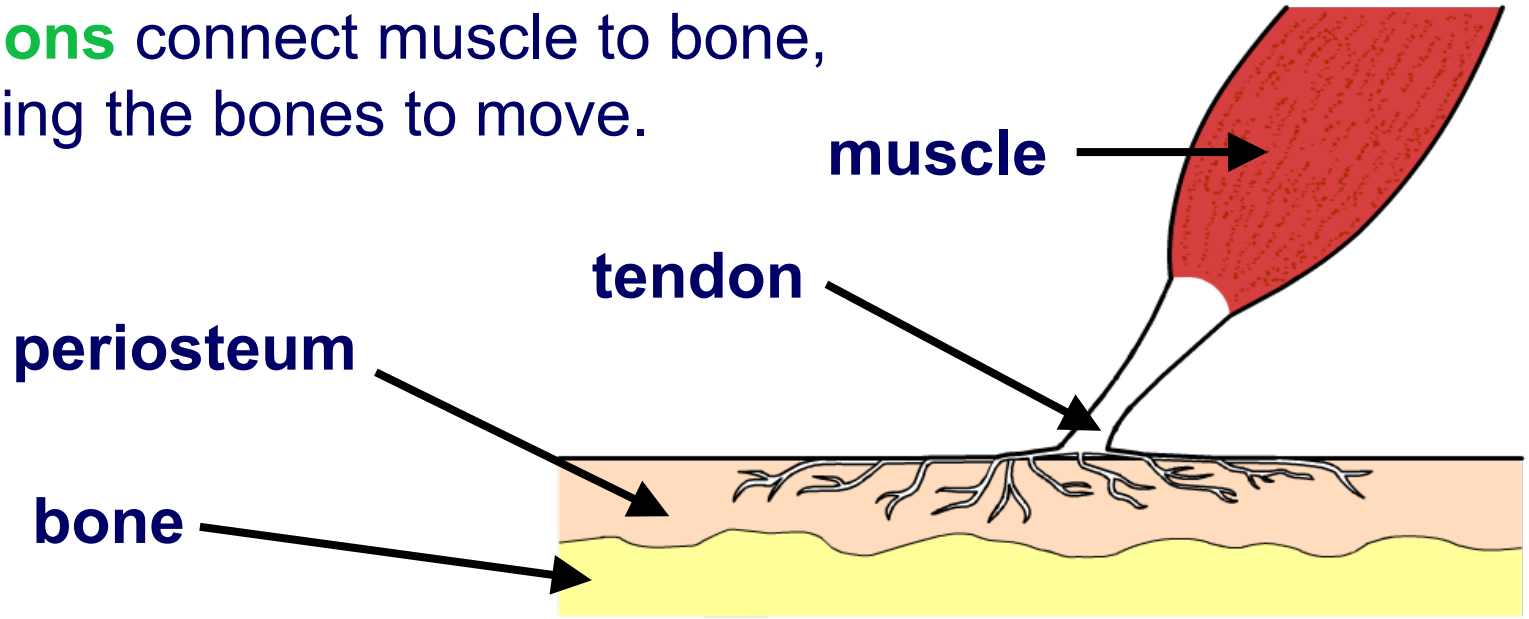
Click on a label to find out more about each part of an adult long bone.

How do we move?

A **joint** is a place where two or more bones meet. Without joints, our skeleton would not be able to move.

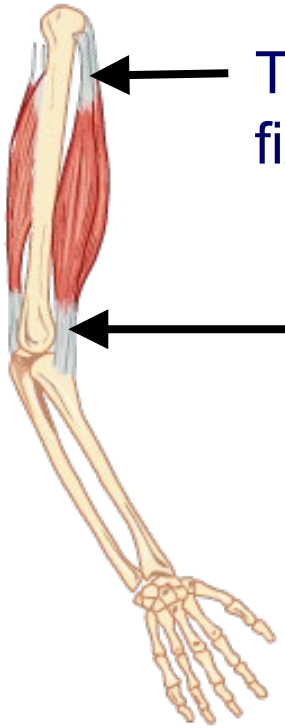
The bones at joints are bound together by strong flexible fibers called **ligaments**. Ligaments allow movement but make sure the joint doesn't move too far, preventing injury.

Tendons connect muscle to bone, allowing the bones to move.



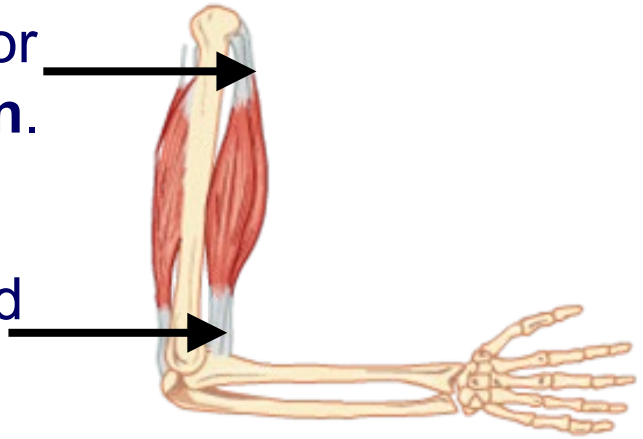
Movement of joints

Muscles are attached to bones by tendons.



The tendon at the non-moving (or fixed) end is known as the **origin**.

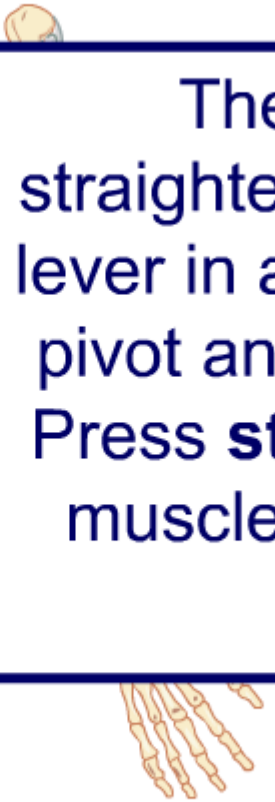
The tendon at the moving end is known as the **insertion**.



Muscles **pull** by contracting – they cannot push to produce the opposite movement.

Muscles are arranged in **antagonistic pairs**. As one muscle contracts (shortens) its partner relaxes (lengthens). They swap actions to reverse the movement.

How do muscles make joints move?



The arm bending and straightening is an example of a lever in action – the elbow is the pivot and the bone is the lever. Press **start** to see how the arm muscles produce movement.

start

The human skeleton

Complete these sentences about the human skeleton

1. The human skeleton is made from cartilage and _____.

2. Bones initially form in the womb. They are made entirely from _____.

3. The process of _____ replaces cartilage with hard bone. Minerals such as _____ and phosphorus move into the bone, causing it to

antagonistic	cartilage	magnesium	calcium
hard bone	ossification	stronger	tendons

hide solve