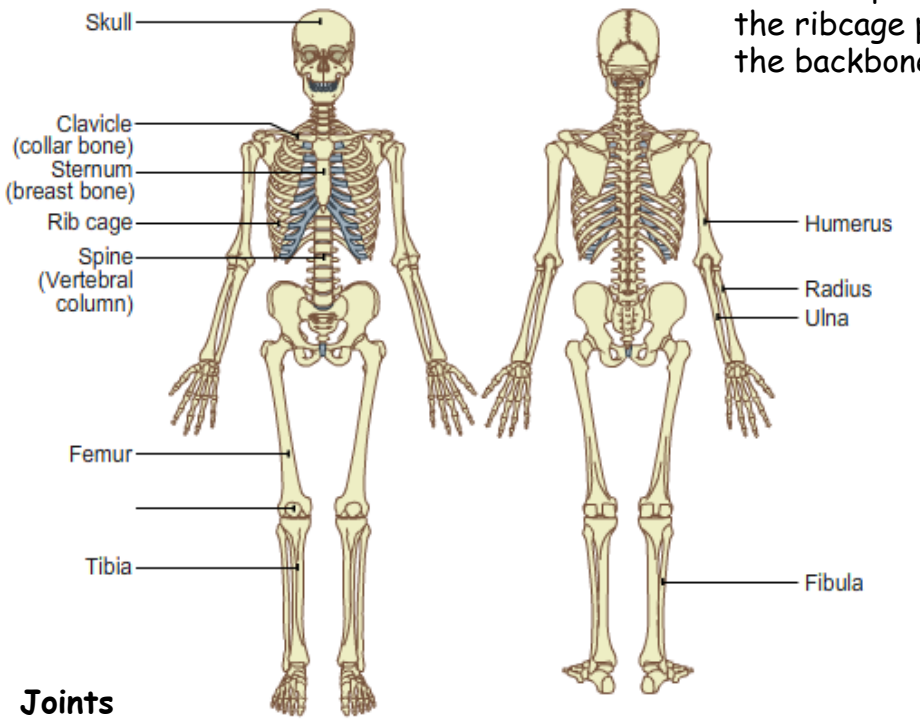
Movement

Why do we need a skeleton?
Our skeleton is made of more than 200 bones. **Calcium** and other minerals make the bone strong but slightly flexible.

Bone is a living **tissue** with a blood supply. It is constantly being dissolved and laid down, and it can repair itself if a bone is broken. Exercise and a balanced diet are important for a healthy skeleton.

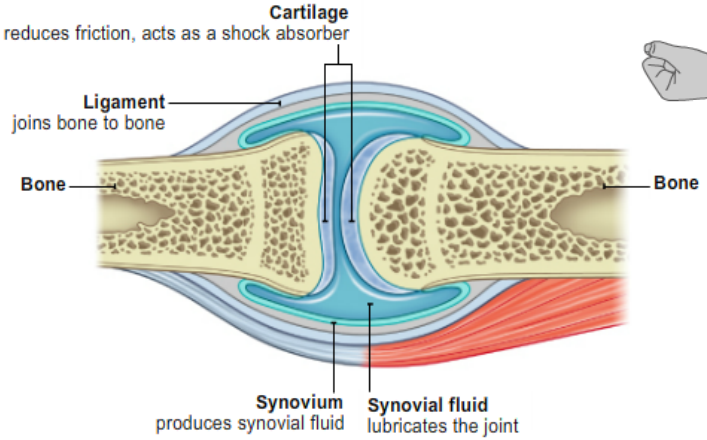


The skeleton has three main functions:

1) Support
The skeleton supports the body. For example, without a backbone we would not be able to stay upright.

2) Protection
Here are some examples of what the skeleton protects:
the skull protects the brain
the ribcage protects the heart and lungs
the backbone protects the spinal cord.

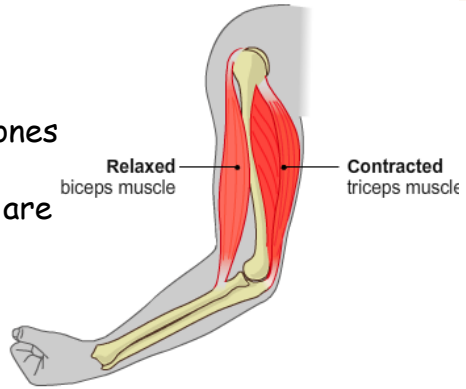
3) Movement
Some bones in the skeleton are joined rigidly together and cannot move against each other. Bones in the skull are joined like this. Other bones are joined to each other by **flexible joints**. Muscles are needed to move bones attached by joints.

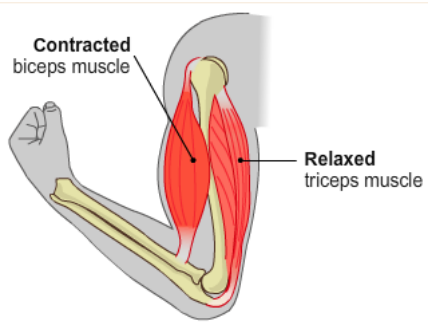


Joints
This page is about the joints in the skeleton that allow movement.

Basic structure
If two bones just moved against each other, they would eventually wear away. This can happen in people who have a disease called **arthritis**. To stop this happening, the ends of the bones in a joint are covered with a tough, smooth substance called **cartilage**. This is kept slippery by **synovial fluid**. Tough **ligaments** join the two bones in the joint and stop it falling apart.
The diagram shows the main features of a joint.

Antagonistic muscles
Muscles work by getting shorter. We say that they **contract**, and the process is called contraction.
Muscles are attached to bones by strong **tendons**. When a muscle contracts, it pulls on the bone, and the bone can move if it is part of a joint.
Muscles can only pull and cannot push. This would be a problem if a joint was controlled by just one muscle. As soon as the muscle had contracted and pulled on a bone, that would be it, with no way to move the bone back again. The problem is solved by having muscles in pairs, called **antagonistic muscles**.





Movement
Different types of joint allow different types of movement.

Hinge joints allow simple movement, the same as a door opening and closing. Knee and elbow joints are hinge joints.

Ball and socket joints allow movement in more directions. Hip and shoulder joints are ball and socket joints.
The bones cannot move on their own - they need muscles for this to happen.