



Living bones

Bones are made up of a living material, just like any other part of your body. This is how they can repair themselves when they break.

Although bones may appear to be lifeless, they are in fact made of living material just like the rest of the body. Because it is alive, bone can grow and repair itself if it gets broken. If bones were dead they would not be able to do this.

The ends of the long bones contain a red material called marrow (Picture 1). This is where fresh blood is made for our bodies. Fresh blood leaves the marrow and travels through the bone in tiny tubes which connect to the rest of our blood.

Hollow bones

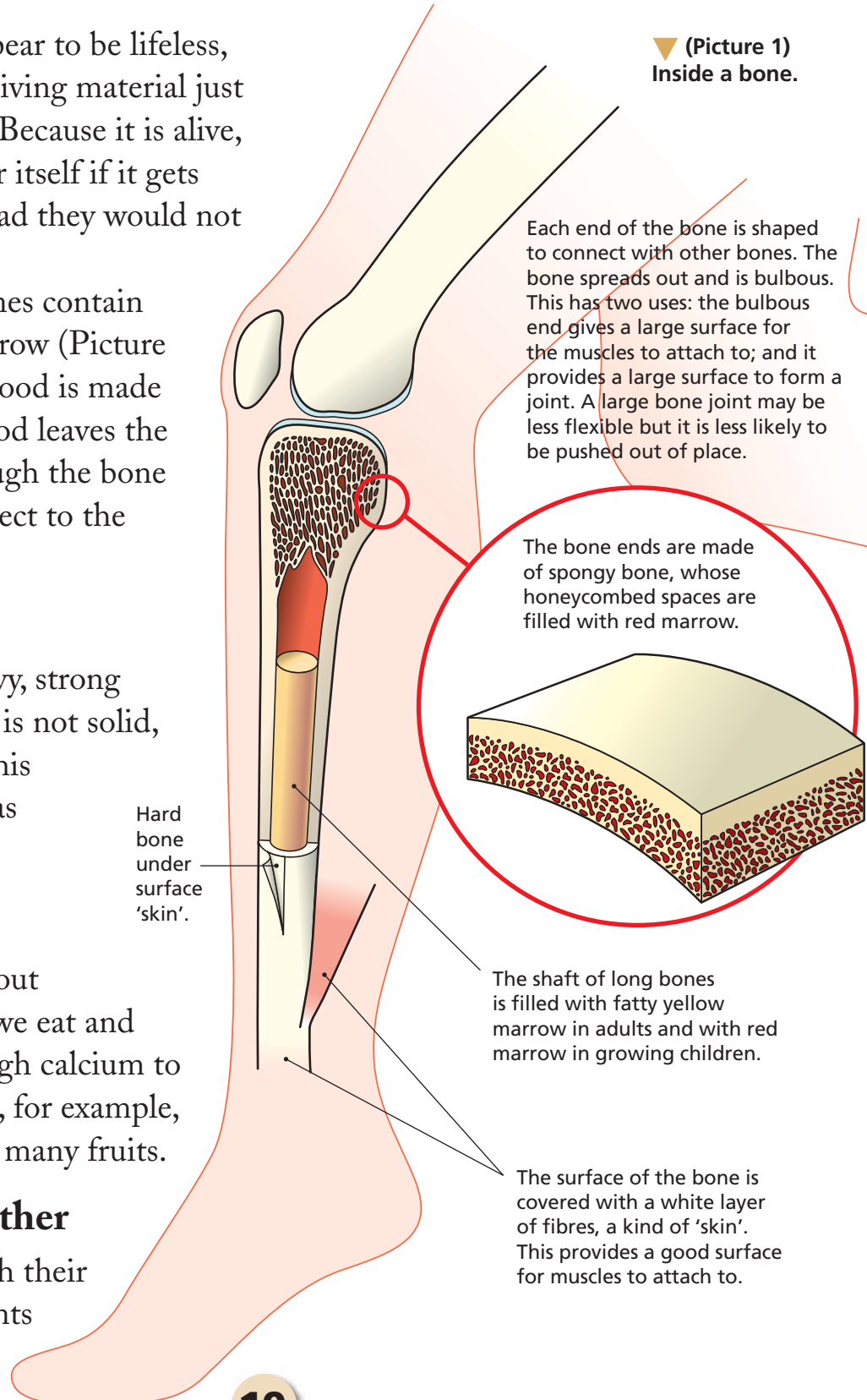
Bones are made of a heavy, strong material. However, bone is not solid, but like a honeycomb. This keeps it strong, but also as light as possible.

Bones are made using a substance called calcium.

Bones cannot grow without it. That is why the food we eat and drink must contain enough calcium to build strong bones. Milk, for example, is rich in calcium. So are many fruits.

Holding bones together

Bones support us through their strength and rigidity. Joints



▼ (Picture 1)
Inside a bone.

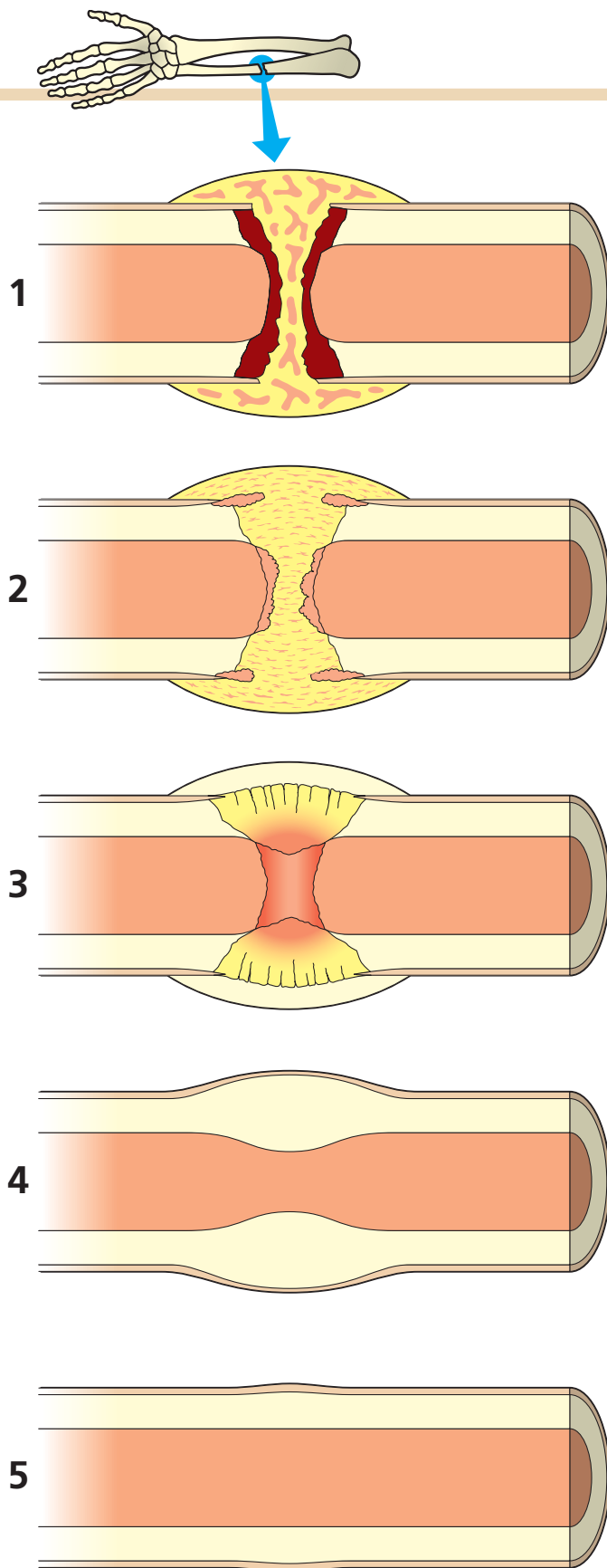
Each end of the bone is shaped to connect with other bones. The bone spreads out and is bulbous. This has two uses: the bulbous end gives a large surface for the muscles to attach to; and it provides a large surface to form a joint. A large bone joint may be less flexible but it is less likely to be pushed out of place.

The bone ends are made of spongy bone, whose honeycombed spaces are filled with red marrow.

Hard bone under surface 'skin'.

The shaft of long bones is filled with fatty yellow marrow in adults and with red marrow in growing children.

The surface of the bone is covered with a white layer of fibres, a kind of 'skin'. This provides a good surface for muscles to attach to.



▲ Bone repair. (1) Swelling occurs because blood clots around the break. (2) A week later new bone starts to grow. (3) After three weeks, the broken ends grow together. (4) The repaired bone is thicker because it has new bone as well as old bone. (5) After several months, the bone returns to its original thickness.

help the bones move. Joints have special cushions – called **CARTILAGE**, to help them move smoothly. Bones and cartilage are ‘lashed’ together by strong, rubbery fibres called **LIGAMENT**.

By themselves, bones, cartilage and ligaments cannot make us move. For this we use flesh called muscle. You will find out more about muscles on pages 14 to 15.

When bones break

For all their strength, bones are brittle and cannot bend. This makes them likely to break if a large force acts on them, such as in an accident.

When a bone breaks, the blood vessels running through it break too, causing bleeding and swelling (Picture 2). The blood then **CLOTS**, forming a temporary kind of glue until the bone has repaired itself. This clotted blood makes the area around the bone swell.

After about one week, bone cells from the broken ends start to grow into the clotted area. It takes months for the bone ends to knit together properly, and in the meantime the bone is weak and there is a risk of further breakage. This is why broken bones are supported with plaster casts.

Summary

- Bones are made up of living material as are all other parts of the body.
- Bones are made using calcium.
- Bones repair themselves when they are broken.