



Using metals

Weight for weight, metals are among the strongest materials. They can be made into many shapes, they will stand up to high temperatures and many of them are cheap to make.

If you want a material to build a bridge or an aeroplane, you turn to metal. If you want a spring, a key or a tap – metal is the best material. And if you want something to carry electricity, then you must use a metal.

▼ **Picture 1)** Motor vehicles – like this sand buggy – are all made from metal. The frame is strong steel and the engine, which gets very hot, is made with steel and aluminium. The shiny parts are a metal called chromium.

Steel

Steel is the most commonly used metal because it is so strong. It can also be rolled into sheets or pressed into shapes, like motor vehicles, because it will bend and stretch (Picture 1). Steel can be made into girders and tubes, and used to make the strong frames for skyscrapers and bridges.

But steel will not last well in damp air and it will begin to go pitted and flaky. This is called **RUST** (Picture 2).



◀ **Picture 2)** A rusty steel bolt. Notice how the surface is brown and flaky.



Steel can be painted or coated with plastic to stop it from rusting. Steel can also be mixed with other metals to make it harder and stop it rusting. This is called stainless steel.

Aluminium

Aluminium is light and does not rust, so it is used where these properties are important – for example to make the bodies of aircraft and to make food and drink cans (Picture 3). Aluminium will bend and stretch more easily than steel.

Copper, silver and gold

Copper, silver and gold are soft metals. But they don't rust and electricity flows through them extremely well.

Copper, silver and gold have been used to make coins and jewellery for thousands of years (Picture 4).

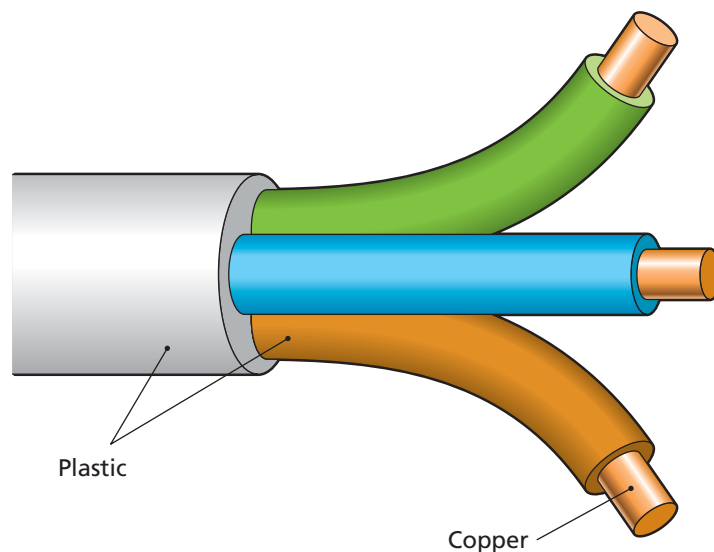
Electricity flows easily through copper, which is why it is used in electrical wires (Picture 5).



▲ (Picture 3) Aluminium is widely used for cans because it will not rust and is lightweight.



▲ (Picture 4) This is a gold coin. Both gold and silver are scarce metals and so are valuable. Gold and silver are also soft and so can easily be stamped or bent into shapes such as jewellery.



▲ (Picture 5) Copper is a very good conductor of electricity and so is used in wires (the covering is plastic, see page 23).

Summary

- Some metals are very strong.
- Steel is the cheapest metal but it can rust.
- Aluminium is expensive, but light, and won't rust.
- Some metals are scarce and used sparingly.