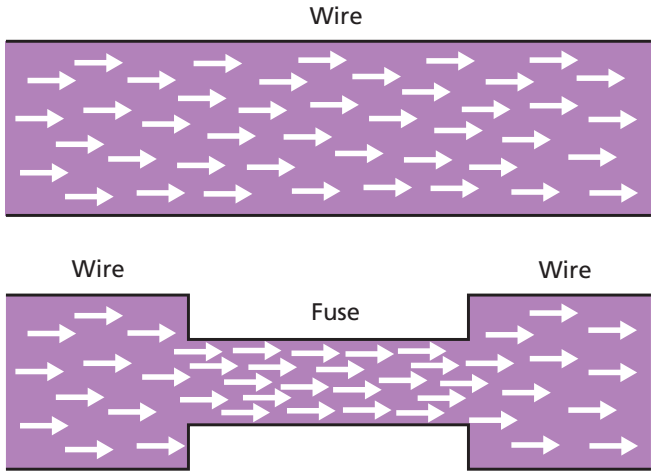

# Fuses

**A fuse is an emergency switch. It is a thin wire which will easily melt and break the flow of electricity when a circuit becomes overloaded.**

Imagine a circuit wire as a pipe full of water. The wider the pipe, the more water it can carry. Normally, electrical currents flow quite slowly through the wires of a circuit, just as water might flow slowly through a pipe.

What happens when you try to force a lot of electricity around a circuit? The answer is that the electrical flow speeds up. Just as fast-moving water brushes against the walls of the pipe and warms it up, so fast-moving electricity makes a wire get warm.




▲ **(Picture 1) A fuse is a very thin wire with a low melting point. The voltage which the fuse can take is matched to the voltage of the circuit to make sure it is the first thing to fail.**

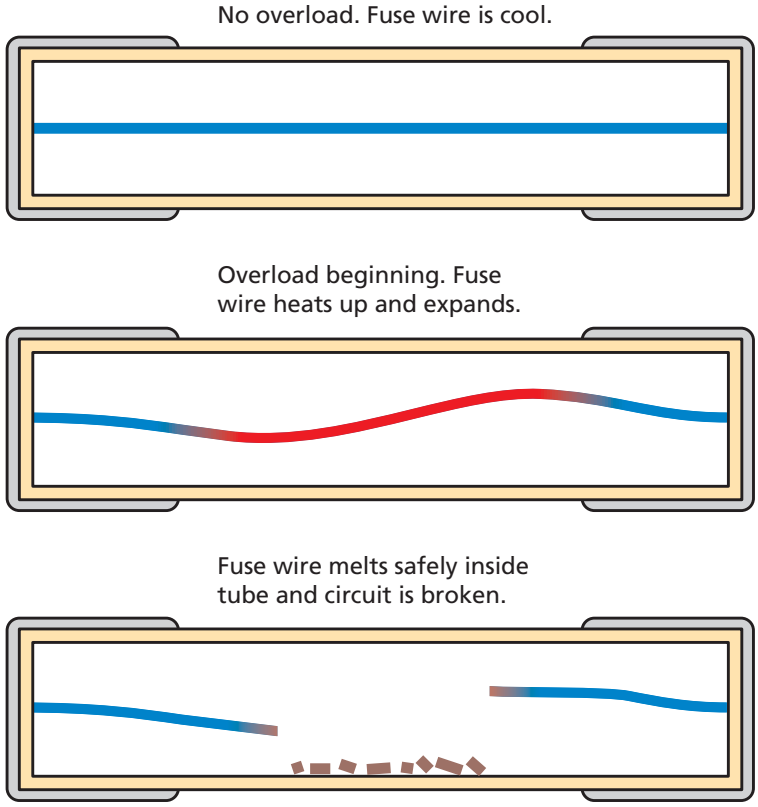
## Fuses

It is often dangerous to allow wires to heat up because they can produce fires. This is why we use a safety device called a **FUSE** (Picture 1).

A fuse is a small length of thin wire made of a metal that melts as it warms up (Picture 2). As soon as the wire melts, the circuit is broken. When this happens, people say that the 'fuse has blown'.

Fuse wire is kept in special safety tubes to prevent the melting wire from touching anything that could catch fire.

▼ **(Picture 2) The stages of a fuse blowing.**



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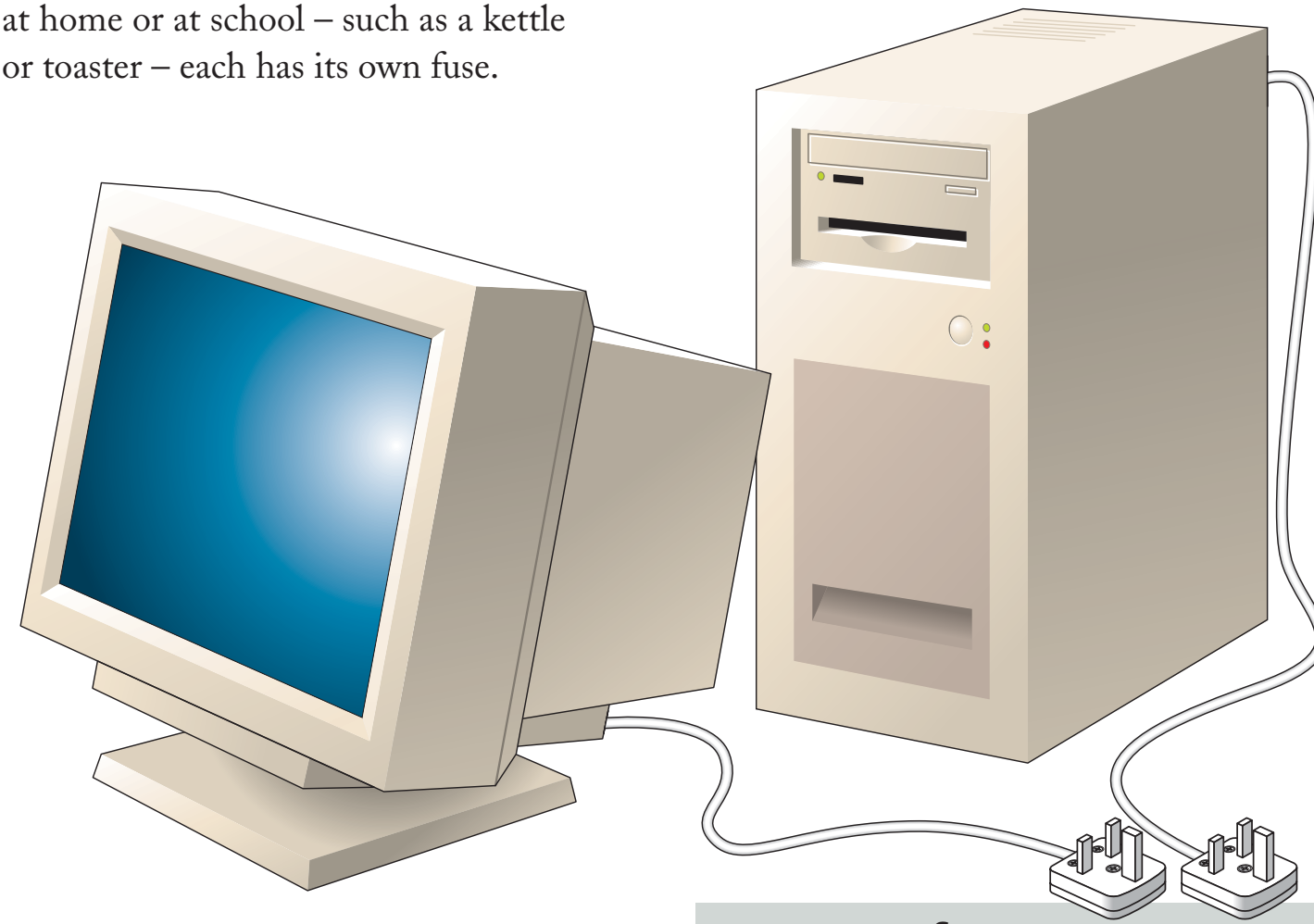
## Fuses and circuits

Fuse wires have to be used carefully. If you have a thick fuse wire in a circuit where the other wires are thin, the fuse wire may not be the first to heat up and the whole purpose of the fuse would be lost. But if the fuse wire is too thin, it will keep melting and the circuit will never work. Fuses must be matched to the circuits they are used in.

The electrical equipment we use at home or at school – such as a kettle or toaster – each has its own fuse. The fuse is often in the plug. Picture 3 shows how fuses are used to protect sensitive equipment.

Fuses that are fitted inside plugs are always labelled to show what their values are. Lights, radios, TVs and the like are protected by either a 3A or a 5A fuse, while kettles and similar appliances are protected by a 13A fuse. A 13A fuse must *never* be used in a circuit for low-power electrical equipment.



▲ **(Picture 3) A computer is always fused. There will be a fuse in the computer case (and in the monitor case) and often in the mains plug, too.**

### Summary

- **A fuse is used to protect circuit wires from overheating.**
- **A fuse is used to protect sensitive equipment such as computers.**
- **The correct fuse must always be used.**