8 Using electricity for heat

When a large current flows through a thin wire, it will get hot. This is how a heating element works.

Electricity is useful in many ways around the home. For example, when electricity flows through a wire, the flow of electricity causes the wire to heat up. Many pieces of electrical equipment contain wires that heat up in a controlled way. (Note: Of course, uncontrolled heating of wires is very dangerous.)

Heating elements

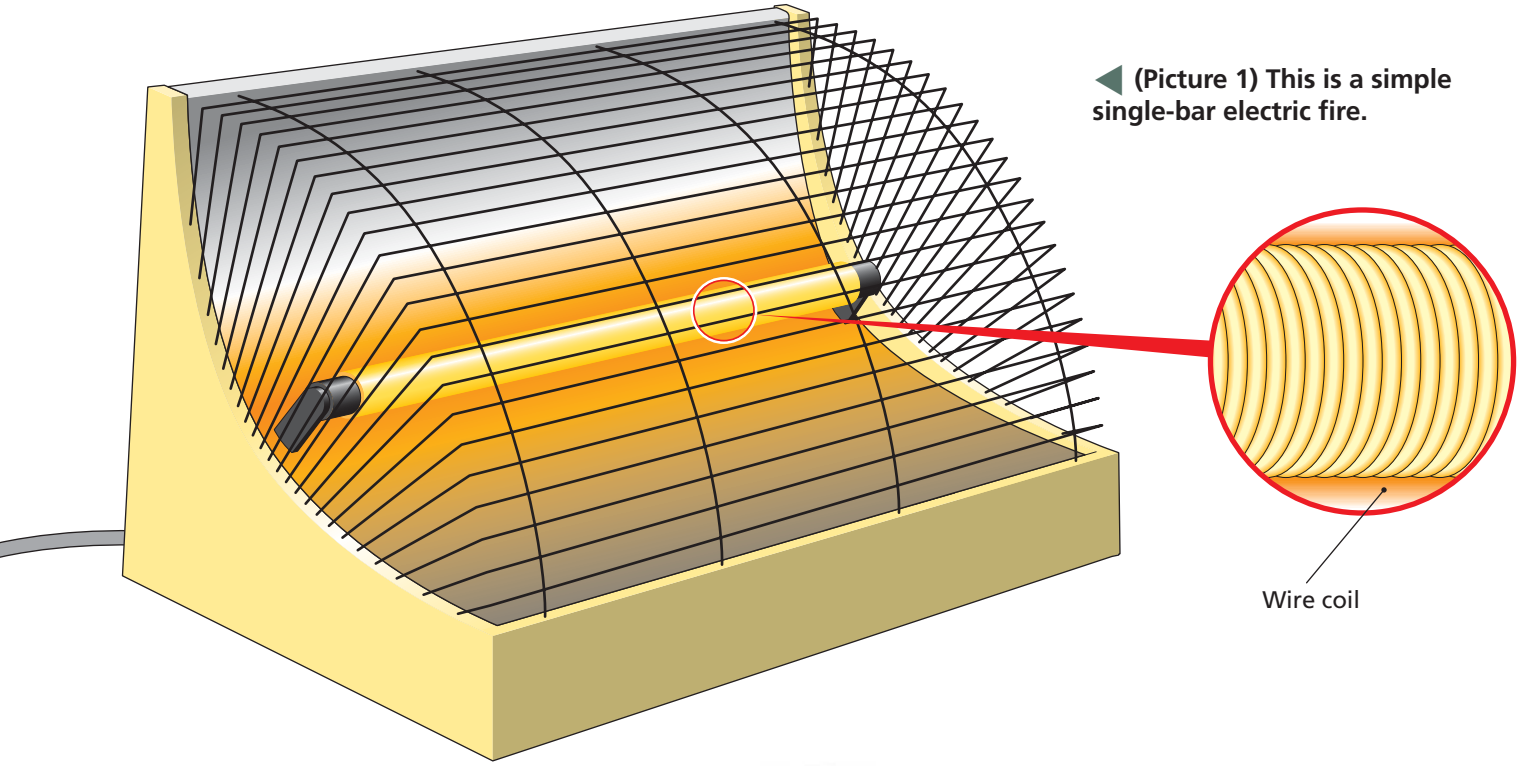
If you look at an electric fire (Picture 1) you will see that the heating part – called the heating element – is made of a coil of wire. This is a special type of wire that does not melt when it becomes red hot.

When the heater is switched on the current flows through the heating element just as it would flow through a bulb.

Remember that when a wire carries a large amount of electricity compared with its width, it can give out both heat and light. In some fires the light is used to give a 'warm' glow and, as a safety measure, to tell you that the heater is on.

Heat from electricity

Heating elements look very different, depending on where they are needed, but the principle is always the same.



◀ **(Picture 1) This is a simple single-bar electric fire.**

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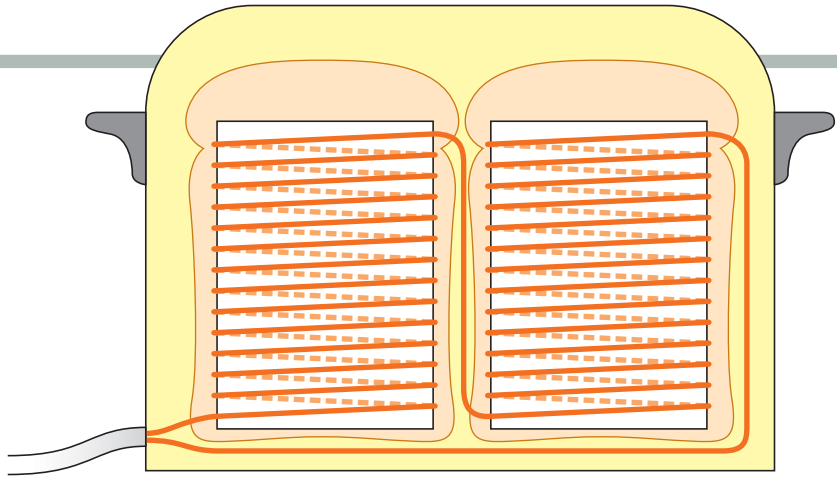
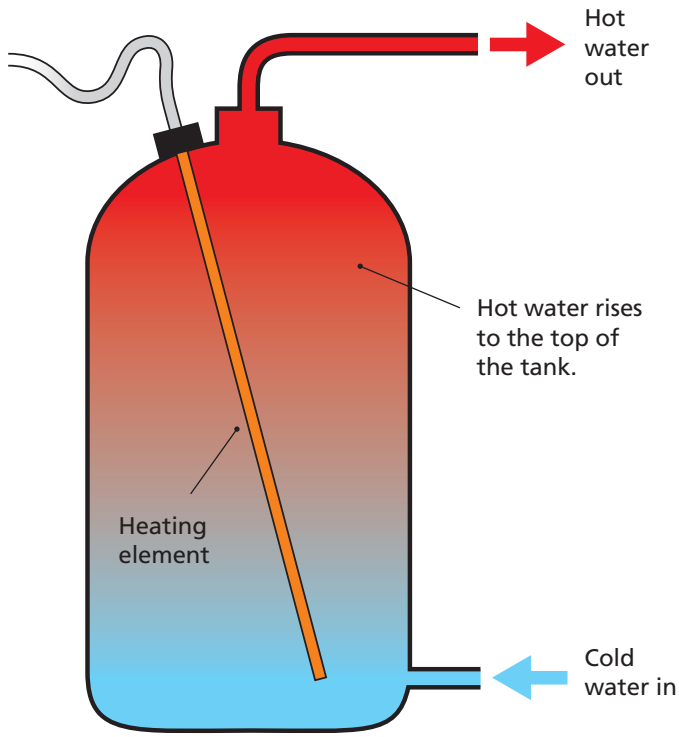


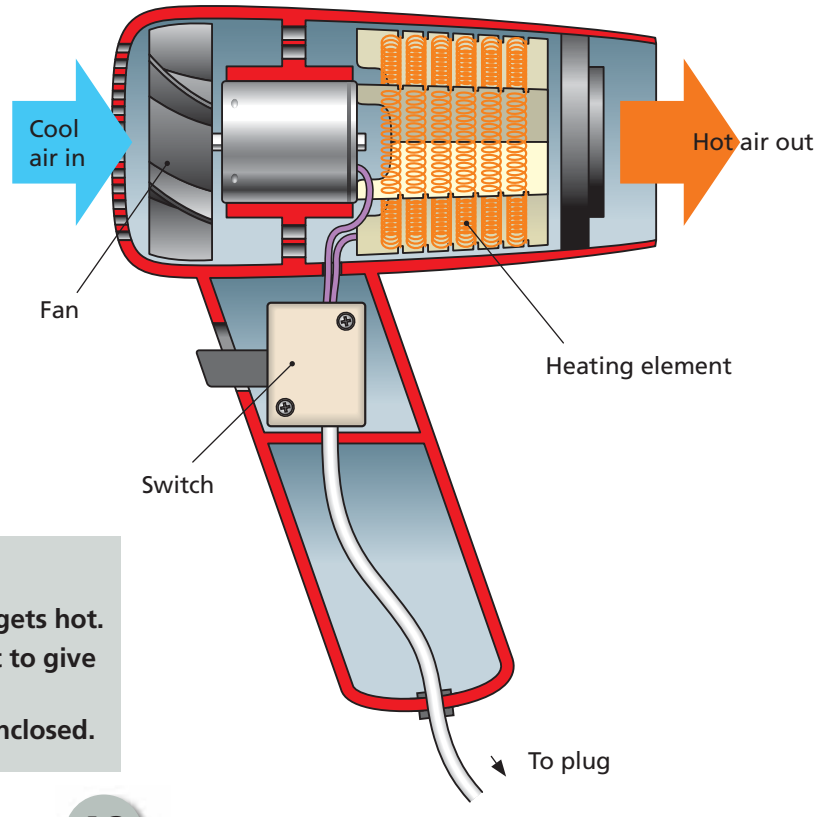
▲ **(Picture 2) This shows the heating element in a toaster. The element is kept away from the bread by a wire cage inside the toaster.**

Here are common places where heating elements are found:

- Toasters (Picture 2).
- Electric kettles.
- Electric blankets.
- Electric heaters or fires (Picture 1).
- Electric water heaters (Picture 3).
- Electric showers.
- Electric hair dryers (Picture 4).
- Electric irons.
- Electric ovens, grills and hot plates.



▲ **(Picture 3) This shows the heating element in an immersion heater inside a hot water cylinder. This is the kind of thing that provides hot water for your taps. The element has to be insulated from the water, so it is placed in a sealed tube with a thermostat in the top.**



▶ **(Picture 4) A hair dryer is like an electric fire, with the element exposed to the air. An electric fan is placed behind the element and it blows air through the element. The air warms up as it passes the element and emerges from the dryer.**

Summary

- **When a large current flows through a wire it gets hot.**
- **When used in heating, wires are designed not to give out much light, as this is not wanted.**
- **All heating elements need to be kept safely enclosed.**

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