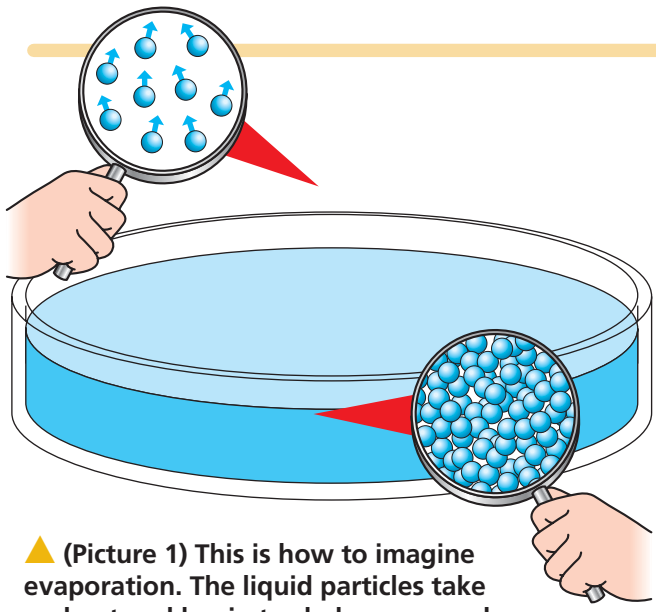
6 Evaporation

When a liquid changes into a gas, it evaporates.

One of the most mysterious things in nature is the way a liquid will slowly disappear if left out in the open. For example, if spilled water is left open to the air in a warm room, within hours it will have vanished. We call this vanishing act **EVAPORATION** (Picture 1). The liquid has changed into an invisible **GAS**.



▲ **(Picture 1) This is how to imagine evaporation. The liquid particles take on heat and begin to shake more and more violently until they shake loose and can drift into the air.**

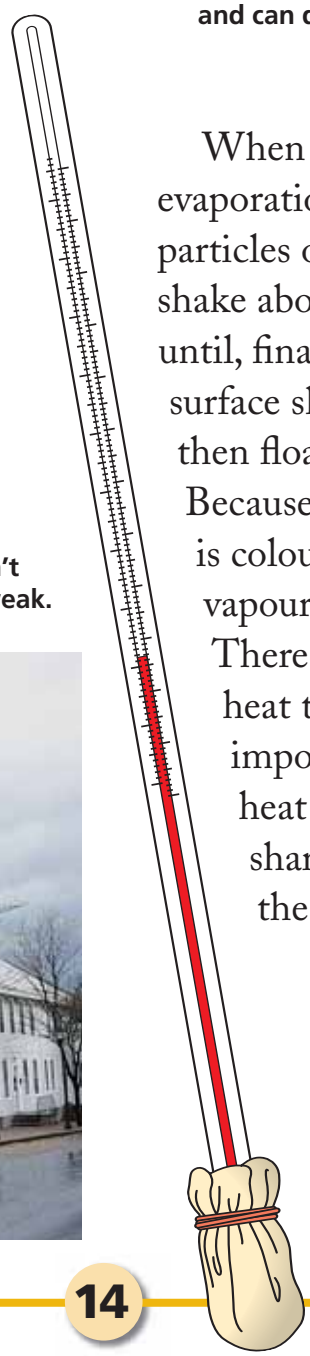
How evaporation works

To change a liquid to a gas, or **VAPOUR**, heat is needed (Picture 2). The source of the heat can be anything – sunshine, for example, or a radiator.

▼ **(Picture 2) You can tell that heat is needed by noticing how much slower evaporation is in the winter, when the weather is cold. Streets may remain damp for weeks because there simply isn't enough heat in the air and the sunshine is too weak.**

When there is lots of heat available, evaporation happens quickly. As the particles of liquid get warmer, they shake about more and more violently until, finally, the particles on the surface shake themselves loose. They then float off into the air as vapour. Because each particle of liquid water is colourless, and very tiny, water vapour is usually invisible.

There are many other sources of heat that cause evaporation. One important one is the air. Air stores heat (Picture 3). When the air shares its heat with the liquid, the liquid can start to evaporate.



◀ **(Picture 3) If a thermometer is wrapped in a piece of wet cloth, the thermometer will show a fall in temperature. This is because heat is taken from the air as the water evaporates from the cloth.**

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One common example is in an airing cupboard. Here heat stored in the air is used to make water evaporate from the clothes.

Evaporation rates

Liquids evaporate when the particles they are made of get enough heat to shake free of the liquid. In some liquids, such as petrol, the particles are held together quite weakly and it is easy for the particles to shake themselves loose. That is why these substances evaporate very easily and quickly (Picture 4).

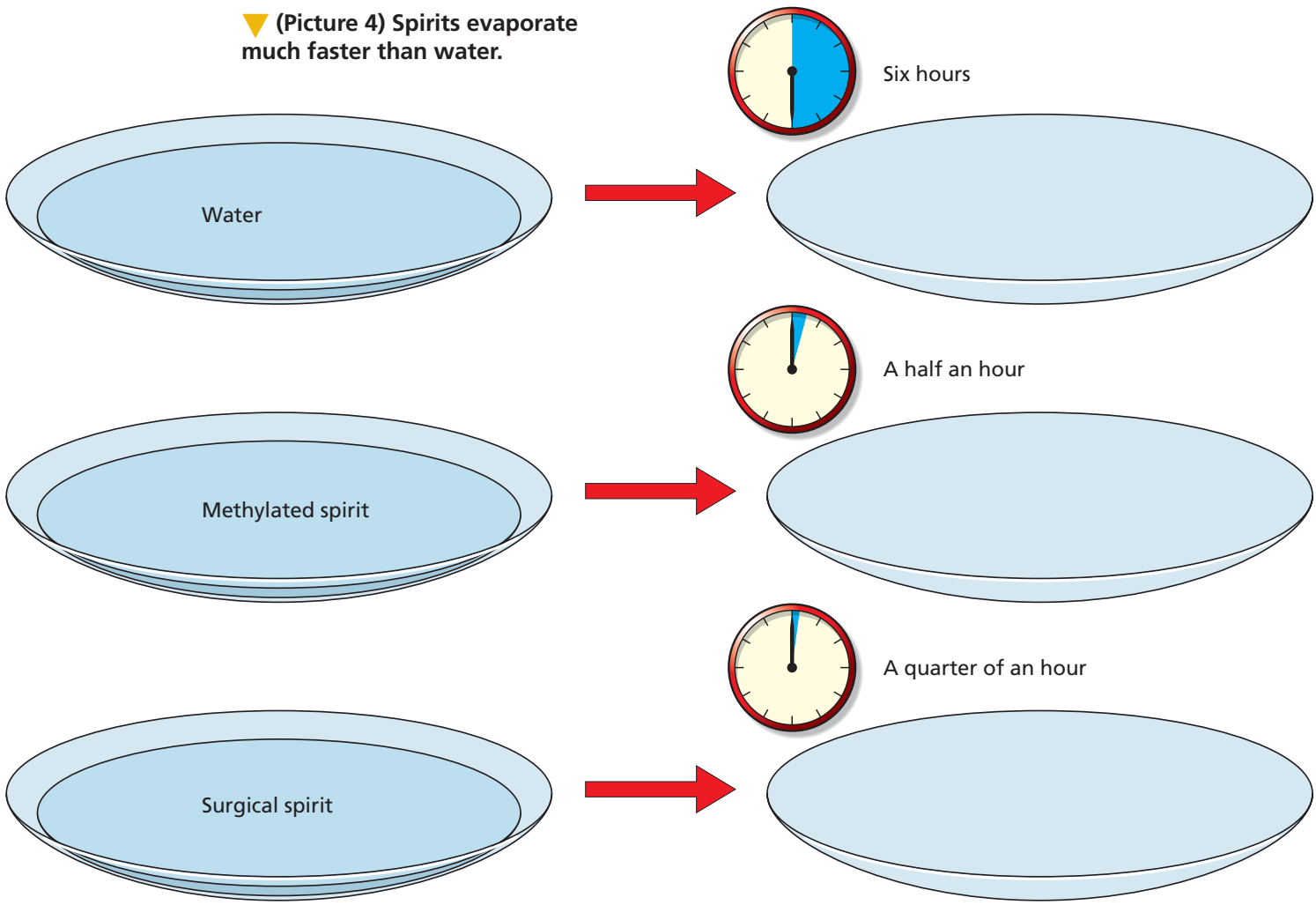
Water is an example of a liquid where the particles are held quite strongly. That is why water evaporates more slowly than petrol.

Some liquids evaporate even more slowly than water. Lubricating oil is one example.

Summary

- **Evaporation happens when particles of liquid escape into the air.**
- **Evaporation needs a source of heat.**
- **Some liquids evaporate faster than others because the particles are bound together less strongly.**

▼ (Picture 4) Spirits evaporate much faster than water.



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