



What is the reading on the thermometer in the diagram?
(This is the temperature of a warm room.)

Choice of liquids

Mercury is used because a) it expands evenly as the temperature rises and b) it is a good conductor of heat. Unfortunately it freezes solid if it is used in very cold places.

Mercury is poisonous and care must be taken if the glass breaks.

Alcohol is often used instead, because a) it can be used at very low temperatures and b) its expansion is six times greater than mercury. Unfortunately it cannot be used in very hot places because it boils at a lower temperature than mercury.

Temperature sensors (electronic)

In your experiments you may use a temperature sensor. This uses a **thermistor** (see page 319). An interface circuit is used to connect it to a computer (see page 314). The computer stores the data (as a **data-logger**) and displays it for you.

A clinical thermometer is used by a doctor or nurse to measure the temperature of your body. A modern clinical thermometer has a thermistor in the probe and a digital readout to display the result:



Absolute zero

As substances get colder, gases condense into liquids and liquids freeze into solids. If the temperature continues to get colder and colder, the molecules vibrate less and less until eventually they have their lowest possible energy. This happens at the coldest possible temperature, at $-273\text{ }^{\circ}\text{C}$, called **absolute zero**. (See also page 31.)

Scientists often measure temperatures on the **Kelvin scale**, which begins at absolute zero but increases just like the Celsius scale. This means $0\text{ }^{\circ}\text{C}$ becomes 273 kelvin (written 273 K) and $100\text{ }^{\circ}\text{C} = 373\text{ K}$.

On a hot day, the temperature is $27\text{ }^{\circ}\text{C}$ – what is this in kelvin?



A liquid-crystal thermometer

