LITTLE BIG FUTURES

INVESTIGATION 7

Expanding air instructions

1. Three quarter fill the syringe with air and then seal the nozzle with glue and wait for the glue to dry.
2. Record the volume of air in the syringe.
3. Lower the syringe into a beaker of iced water until the nozzle touches the bottom of the beaker.
4. Leave the syringe in the cold water for about three minutes.
5. Record the new volume of air in the syringe.
6. Now lower the syringe into a beaker of hot water until the nozzle touches the bottom of the beaker.
7. Leave the syringe in the hot water for about three minutes.
8. Record the new volume of air in the syringe.

Heat detection system

1. Make an electrical circuit with a battery and lamp.
2. Create a gap in the circuit and attach a wire to each side of the gap.
3. The free ends of these wires will act as the contacts in your heat detection system.
4. Lower the syringe into an empty beaker until the nozzle touches the bottom of the beaker.
5. Attach one contact to the top of the syringe plunger and using a stand and clamp, position the other contact a few millimetres above the syringe plunger so that there is a gap of one or two millimetres between the two contacts.
6. Now fill the beaker with hot water.
7. Experiment with the system to find out how you can make it more or less sensitive.

Q. Did the movement of the syringe plunger close the circuit?

Q. How did you make the system more sensitive?

Q. How did you make it less sensitive?

Q. How could you calibrate your sensor so that it triggers an alarm at a specific temperature?

Research questions

Q. Why do substances expand when they are heated?