

INVESTIGATION 4

Melting wire instructions



- Clamp the two nails side by side so that their ends are about two centimetres apart.
- Connect the ends of the two nails using a short length of lead free solder by winding it round the end of each nail.
- Make a series circuit with a battery and lamp. Using crocodile clips, join one side of the circuit to one nail and the other side of the circuit to the other nail.
- Make sure that the crocodile clips do not touch.
- The lamp should light up.
- Now light the small candle and using a pair of tongs, hold the flame just under the length of solder.



Q. Why must you keep the two crocodile clips apart?

Q. Record and explain your observations when you heated the wire.

Q. The lamp is removed, and the 'melting wire' sensor is used as an input in a fire alarm control system. How would you process the data from the melting wire? Select the correct algorithm from the two options below.

Option 1 - if input = 1 then turn alarm output on.

Option 2 - if input = 0 then turn alarm output on.

Research questions

Q. What is the melting point of lead free solder?

Q. Would this fire detection system be more sensitive or less sensitive if you used a length of aluminium wire in the place of the solder?

