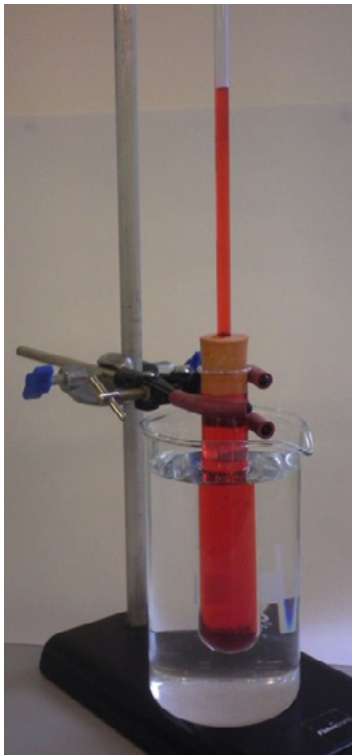




INVESTIGATION 6

Expanding water instructions



- Clamp the boiling tube filled with coloured water in a stand and clamp so that the apparatus can be raised and lowered.
- Place a beaker full of iced water under the apparatus and lower the boiling tube into the beaker of water.
- Allow three minutes for the apparatus to adjust to the temperature of the cold water.
- Mark the water level in the glass tube.
- Now replace the beaker of cold water with a beaker of hot water.
- Lower the boiling tube into the beaker of hot water.
- Allow three minutes for the apparatus to adjust to the temperature of the hot water.
- Once again, mark the water level in the glass tube.
- Measure the distance between the two marks to quantify the amount the water expanded as it heated up.
- Record your observations.

Q. How could you adapt this apparatus to trigger a fire alarm?
Can you think of a way of using the rising water level in the tube as an input in to an electronic control system?

Q. Suppose that the water were replaced by the liquid metal mercury.
Can you think of a way of using the rising mercury level in the tube as an input into an electronic control system?

Research questions

Q. How is the expansion of a liquid used to trigger sprinkler systems?

Q. Why might you NOT want to use mercury in a fire detection system?

