Activity 12: Design your group's sensor

The purpose of your sensor:

Draw a labelled diagram of your sensor design you will need to include a circuit diagram

Explain how your sensor works

Materials you will need

Equipment you will need

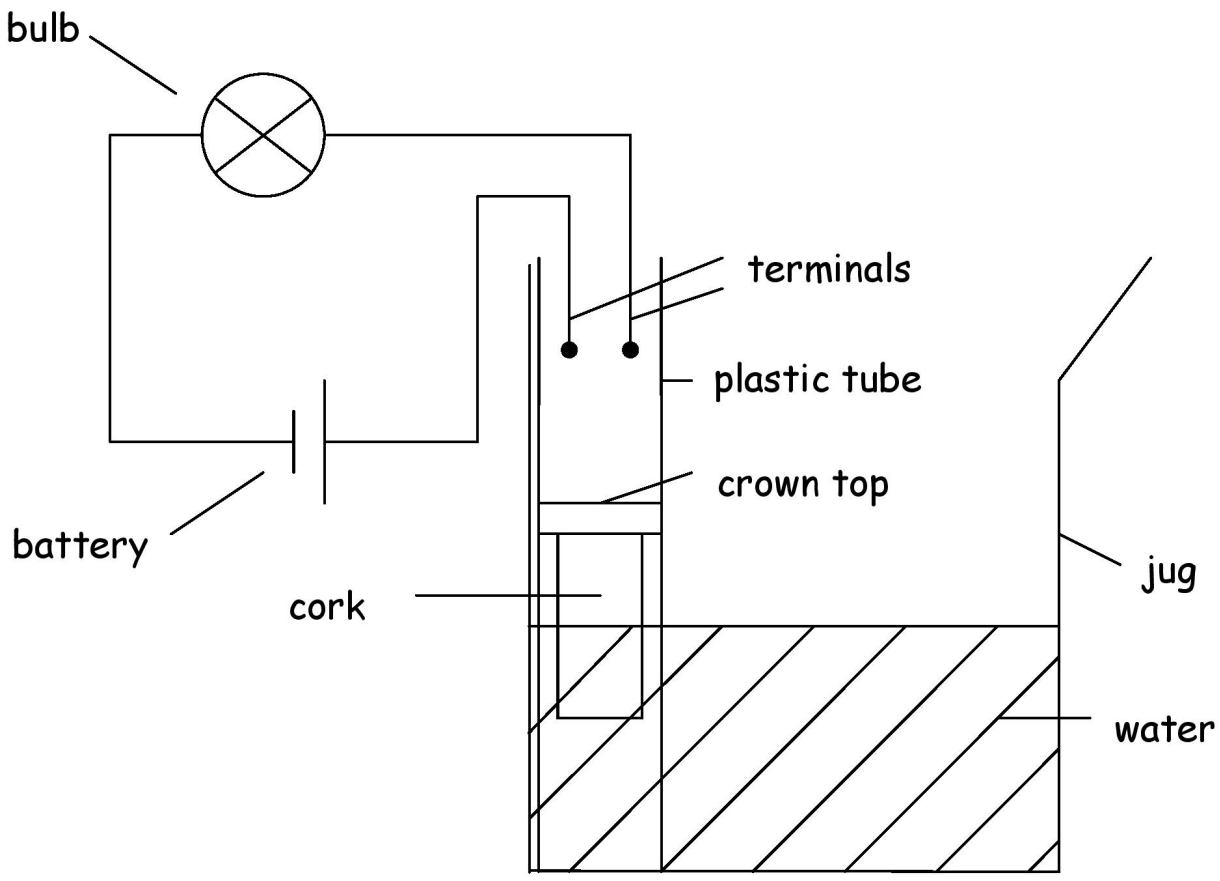
Activity 13: Instructions to make a sensor

Things you need: Plastic tube or rolled plastic sheet, cork, water tank (2lt soft drinks bottle), circuit equipment, paper fasteners and foil, coin or crown bottle top, A5 stiff card, adhesive tape.

1. Place the plastic tube upright in the tank or bottle. Attach it to the side using adhesive tape.
2. Stick the foil, coin or crown bottle top on top of the cork using PVA glue.
3. Make a circuit from the electrical components – follow the circuit diagram, (Activity sheet 8), if you need to – and stick the circuit to the card to make a circuit board. Two unconnected wires should extend from the board.
4. Attach paper fasteners to the two unconnected wires, point the two wire ends down the plastic tube, making sure they don't touch, about 2 cm. at the level where water needs to be indicated and secure.
5. Attach the circuit board to the outside of the tank or bottle with tape making sure this is well away from the water.
6. Place the cork at the bottom of the tube. Now your sensor is ready to be tested.
7. Carefully pour water into the tank or bottle. As the tube fills with water the cork will rise and when the metal top touches the two terminals the circuit will be completed.
8. Remember that the circuit must be kept away from the water at all times. The battery has a low voltage and would not give you an electric shock but mains electricity would. How could the design of this sensor ensure that the circuit was kept dry? Are there any other improvements that you would make?
9. How might you provide electricity if there was no battery?

Activity 13 (continued): Using the sensor

Carefully start adding water. Watch the indicator bulb light-up when the water reaches the set level.



Can you explain how this sensor works?