

# Making switches

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Electrical switch 1

### Aim

To make a paperclip switch.

### Equipment

#### For each team

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• role badges for director, manager and speaker</li> <li>• each team member's science journal</li> <li>• 1 piece of A4 card</li> <li>• 1 battery (1.5V)</li> <li>• 1 bulb (1.5V)</li> </ul> | <ul style="list-style-type: none"> <li>• 3 insulated copper wires, stripped of insulation at each end; or folded foil wires (see 'Folded foil wires', Resource sheet 2)</li> <li>• 2 metal split pins or thumbtacks</li> <li>• 1 metal paperclip</li> <li>• self-adhesive tape</li> </ul> |
|--|---|

### Activity steps

- 1 Make a circuit using a battery, a bulb and insulated copper wire and place it on top of the piece of A4 card.
- 2 Assemble the switch materials on the card as shown below:



Wrap one end of each piece of wire around a metal split pin.



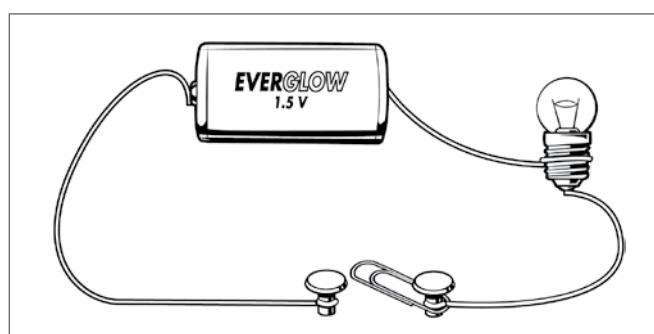
Place the paperclip around the base of one of the pins.



Attach the wires to the card.



Move the paperclip so that it touches the second pin. This will complete the circuit and the bulb will light.



**Paperclip switch**

## Electrical switch 2

### Aim

To make a pressure switch.

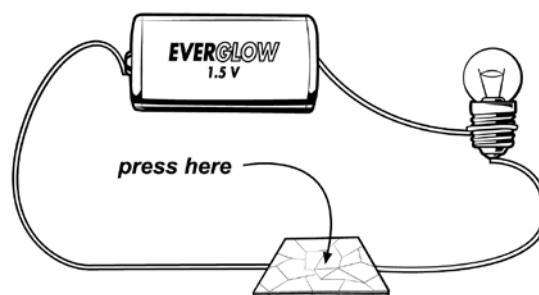
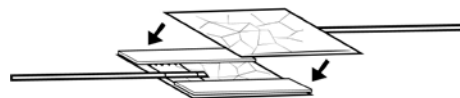
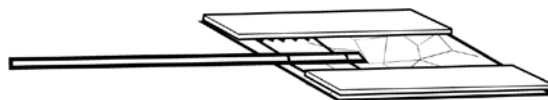
### Equipment

#### For each team

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• role badges for director, manager and speaker</li> <li>• each team member's science journal</li> <li>• 1 battery (1.5V)</li> <li>• 1 bulb (1.5V)</li> <li>• 3 insulated copper wires, stripped of insulation at each end; or folded foil wires (see 'Folded foil wires', Resource sheet 2)</li> </ul> | <ul style="list-style-type: none"> <li>• 3 corrugated-card squares (10cm x 10cm)</li> <li>• aluminium foil</li> <li>• self-adhesive tape</li> <li>• scissors</li> </ul> |
|--|---|

### Activity steps

- 1 Cover two of the 10cm x 10cm cards with aluminium foil.
- 2 Tape 3cm of insulated copper wire to the left-hand side of a card square and 3cm to the right-hand side of another card square.
- 3 To make spacers, cut two 3cm strips from the remaining piece of square. Glue these pieces to one of the foil-covered cards.
- 4 Place the other foil-covered card on top of the spacers. Tape these together to make a stack. It will look like this:
- 5 Connect the wires to the circuit.
- 6 When you press the switch, the two foil surfaces make contact to complete the circuit and the bulb will light. When you stop pressing, the circuit is broken and the bulb will not light. This is called a pressure switch.



**Pressure switch**