

### How many paperclips can you pick up?

#### Materials

Materials required	Per experiment
Screwdriver with plastic head	1
Insulated copper wire	50 cm
4.5 volt battery	1
Sticky tape	1
Ruler	1
Steel paper clips	1
Scissors	1

Some screwdrivers have a magnetic tip. Before you start, test your screwdriver. Can you pick up any paper clips? Record how many you collect. What will happen when the wire and batter are attached? Record your prediction. Compare your results.

#### Method

1. If your wire is double coated, carefully trim the outer insulation off to expose the insulated copper wire.
2. Carefully trim 2 cm of insulation off each end of your copper wire.
3. Lay your wire out in a straight line.
4. Using a ruler measure 20 cm in from one end of your wire and place your screwdriver on the wire, make sure that the wire is positioned closely to the base of the handle.
5. Secure the wire with sticky tape.
6. Take the longer end of wire and wrap it firmly around the screwdriver until you have a 20 cm tail (*take care to ensure you have a single layer*).
7. Secure the loose end to the screwdriver with sticky tape.
8. Connect each end of the wire to a battery terminal (*one each*).



Figure 1: Material set up

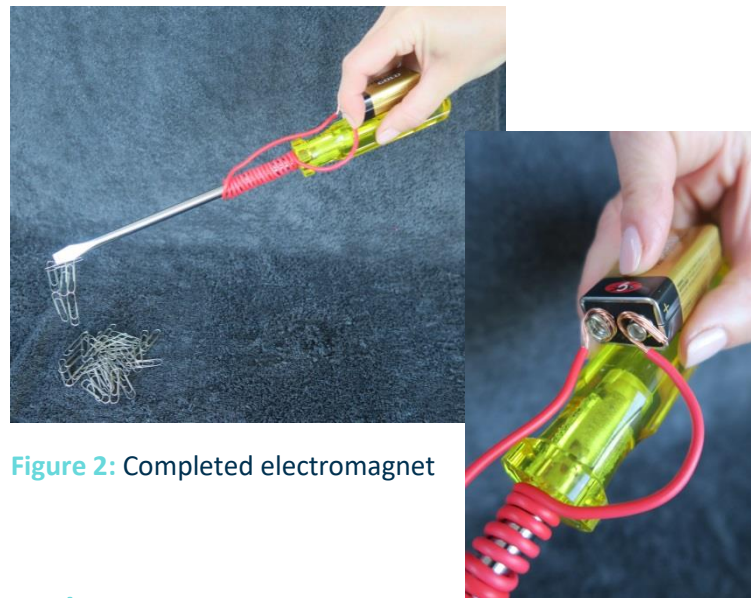


Figure 2: Completed electromagnet

#### Explore

1. How many paper clips can you pick up?
2. What happens if you break the circuit and disconnect one of the connections to the battery terminal?
3. Write up your results.