

LEARNING RESOURCE

ELECTROMAGNET MAGNETISM RESOURCE 8

MATERIALS

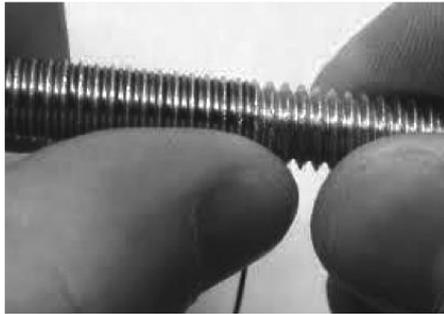
- A large iron nail or screw (approx. 8-10cm) per child
- About 1M of thin insulated, copper wire per child
- D size battery per child
- Foil
- (Insulation) Tape
- Paperclips

PREPARATION

- Pre-cut 1M lengths of wire (and strip 3-5cm of plastic coating from the ends, though you may wish to allow children to do this if time allows).
- Cut foil into smaller sheets to be shared between pupils/tables.

ACTIVITY INSTRUCTIONS

1. Leave about 20cm of wire loose at one end and carefully wrap the rest of the wire around the nail, leaving another 20cm at the end. Make sure you do not overlap the wire; each turn should be next to the one before, as shown in picture – this is why using a screw, rather than a nail, is helpful.



2. Cut two 5cm squares of foil and fold one around each end of the wire; this creates a larger surface area and therefore a better contact between the wire and battery.
3. Using the insulation tape attach one end of wire to either end of the battery
4. Your electromagnet is now ready for use. Provide each table with some paperclips (or other small magnetic items). Hold the point of the nail near paper clips.
5. NOTE: Electromagnets use up batteries quite quickly and due to this can get extremely warm. It is recommended that batteries should be disconnected when not in use.

SUGGESTED EXTENSIONS

- To extend this activity you can try;
 - Using different lengths of wire.
 - Using different types of batteries.
 - Using different core materials (instead of nail/screw).
 - See how much weight your electromagnet can lift and whether changing variables affects this. Does the number of times you wrap the wire around the nail affect the strength of the magnet? Does the thickness or length of the nail affect the electromagnets strength?
 - Does the thickness of the wire affect the power of the electromagnet?
 - Can you create a way of insulating your electromagnet to protect you from the heat?
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