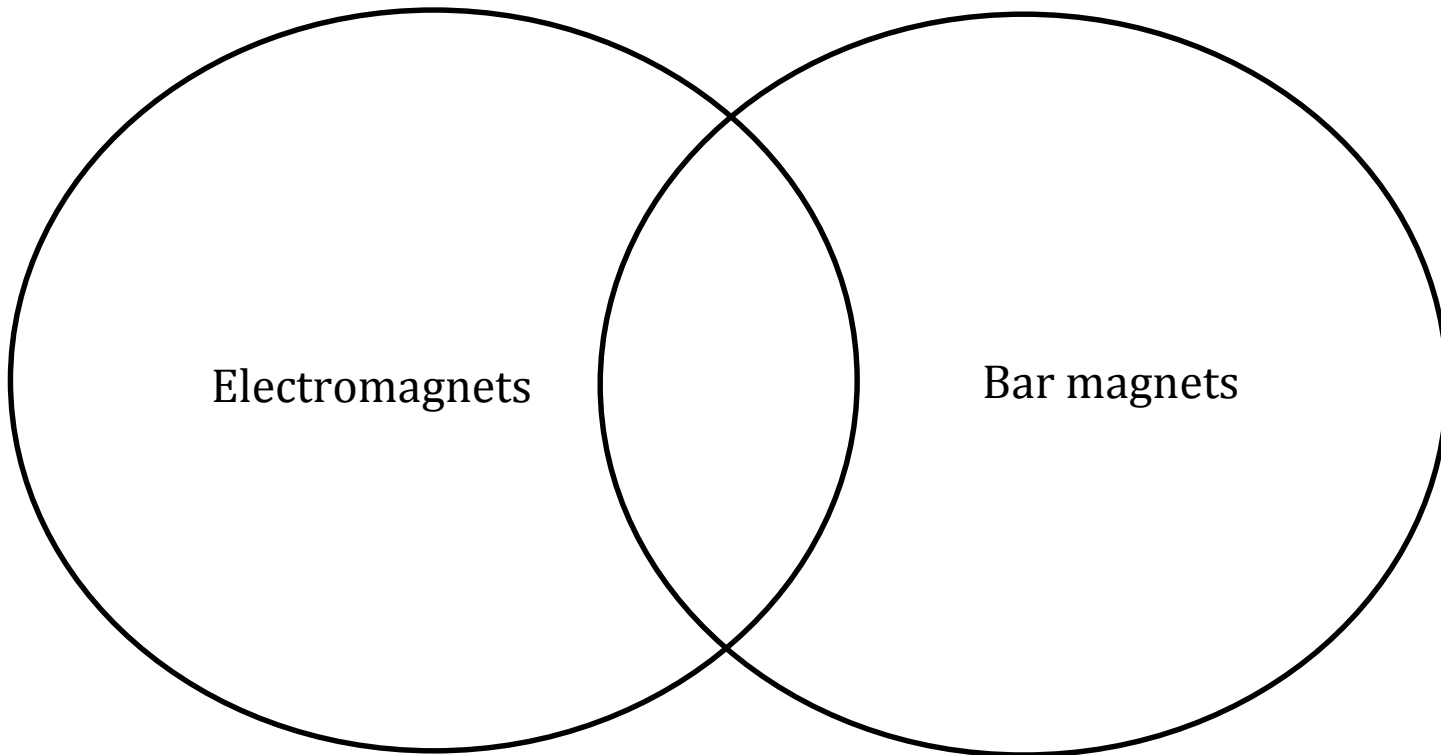


Topic	Electromagnets	Level	Key Stage 3 (or any course for students aged 11-16)
Outcomes	<ol style="list-style-type: none"> To know that when current flows through a wire a magnetic field is produced. The size of this magnetic field can be increased by using an iron core, adding more turns to the wire and increasing the current flowing through the wire. 		
Information for teachers	<p>This activity has been designed to motivate students to investigate electromagnetism. After a demonstration introducing students to electromagnets, students compete to build an electromagnet that can transport exactly 5 paper clips a distance of 1 m. By doing this they will explore the relationships between current, coils and magnetic field strength. You may want to test out the method first to make sure that 5 paper clips is an appropriate number to use.</p> <p>Working in groups of 2 students have 15 minutes to build their electromagnets before they are tested at the front of the class. Using the table on slide 5 you can then find the winner. Share this information before students begin the challenge.</p> <p>Please risk assess this practical before carrying it out.</p>		

Demonstrate how to make an electromagnet

Key points:

- when current flows through a wire it creates a magnetic field around the wire
- the strength of the magnetic field can be increased by adding an iron core and increasing the number of coils
- we can reverse the magnetic field by changing the direction of the current
- the magnetic field can be turned on and off.



Electromagnets

Bar magnets

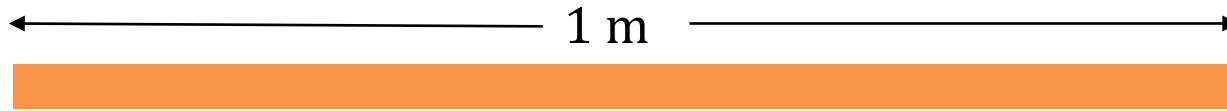
You have the following items.

- A power pack
- A push button switch
- An iron nail
- A length of insulated wire
- Crocodile clips
- 20 paper clips
- Circuit wires

**Pick up only 5
paper clips from
this pile of 20**



**Transport the paper clips over a distance of 1m.
You cannot touch the paper clips.**



**Drop only 5
paper clips
into the cup!**



**Your challenge: create an electromagnet that will
pick up, transport and release exactly 5 paper clips
over a distance of 1 metre.**

