

SUBJECT:

UNIT: Year 8 Electromagnets



While you were away.

Lesson one: Magnets

1. Which metals are magnetic?
2. What are the poles on a magnet called?

Lesson two: Magnetic fields

1. What is the direction of the field lines around a magnet?
2. Where are the field lines the strongest?

Lesson three: What is an electromagnet?

1. What do you call the centre of an electromagnet?
2. What is the centre of an electromagnet called?

Lesson four: Testing electromagnets

1. How do you turn an electromagnet on and off?
2. What affects the strength of an electromagnet?

Lesson five: Circuit breakers and bells

1. Describe how a circuit breaker works
2. Describe how an electric bell works

SUBJECT: Science

UNIT: Y8 Electromagnets



Key Vocabulary

Magnet

Contains a north and south pole

Attraction

Opposite poles attract

Repulsion

Like poles repel

Electromagnet

Can be turned on and off

Core

Centre of an electromagnet

Solenoid

Contains wire with current flowing through it

Magnetic materials

Iron (and steel), Cobalt and Nickel

Magnets

A magnet has two magnetic poles- a north seeking pole and a south seeking pole.

The end that points towards the magnet north pole is called the north seeking pole.

The other end of the magnet is called the south seeking pole.

Attraction and repulsion

Opposite poles attract.
Like poles repel.

Magnetic fields

There is a magnetic field around a magnet.

The fields are strongest at the poles.

The magnetic field always runs from north to south pole.

Iron filings or a compass can be used to detect the field lines.

Ambitious Vocabulary

Electromagnet

Attraction

Testing electromagnets

You can turn an electromagnet on and off by turning the current on and off.

You can investigate the strength of an electromagnet by changing:

- Current
- Number of turns of coil
- Metal used for the core

You can determine the strength by counting how many paper clips it can pick up.

Uses of electromagnets

- Scrap yards
- Electric doorbells
- Relays
- Circuit breakers
- Generators
- Motors
- Loudspeakers
- MRI scanners
- Particle accelerators
- Magnetic locks
- MAGLEV trains

Electromagnet

A solenoid with a current moving through it.

Electromagnets

A non-permanent magnet turned on and off by controlling the current through it.

They usually have a magnetic material in the centre called the core.

This makes the electromagnet stronger. Most cores are made from iron.

Circuit breakers

When a large current flows in a wire around the electromagnet the electric field is strong enough to attract the iron catch. The catch moves and breaks the circuit.

Loudspeaker

The coil becomes an electromagnet that changes in strength.

Electric bells

The electromagnet attracts the iron armature. The circuit breaks. The coil and core are no longer magnetic. Now the circuit is complete and the bell will ring.