

Scheme of Learning: Electricity & Magnetism

Topic Sequence:

1	2	3	4	5	6	7	8	9	10
Lab Skills	Particles and Separation Techniques	Forces	Cells and Organisation	Elements and the Periodic Table	Energy	Health and Human Body	Chemical Reactions	Electricity and Magnetism	Reproduction

Topic Overview:

Electricity and magnetism has been covered in three of the four years at KS2. Students should have an understanding of simple circuits, including some circuits symbols and understand that magnets can exert a force at a distance on certain materials.

In this topic we cover:

Current electricity – students should gain knowledge of current, potential difference and resistance in simple series and parallel circuits.

Static electricity – the is caused by the transfer of electrons between two insulating materials and creates electric fields which can exert a force at a distance.

Magnetism – including magnetic field patterns, the Earth as a magnet, electromagnets and simple d.c. motors.

Lesson Sequence:

We begin with a recap of the information taught at KS2, looking at basic circuits and symbols. This then develops into a more detailed understanding of the concepts of current, potential difference and resistance in electric circuits.

We then look at static electricity caused by the transfer of electrons and demonstrate the effect of electrostatic forces.

Next we look at permanent magnets and identify the magnetic field pattern around a bar magnet. This is then compared to the magnetic field of the Earth.

Finally, we look at how the ideas of the topic can be linked together in electromagnetism and how electromagnets can be useful.

Please note: some of the lessons will take more than the 1 hour lesson slot. Please account for this in your advanced planning.

Sequence of Lessons:

Resources:

1	Current	1	Yellow kit bulbs, cells and ammeters, leads
2	Potential difference	2	Yellow kit bulbs, cells and voltmeters, leads
3	Series and parallel	3	Worksheet, yellow kit bulbs, cells, ammeters and voltmeters, leads
4	Resistance	4	Worksheet
5	Static electricity	5	Van der Graaff worksheet, Demo – balloon, plastic rod and cloth, hole punchings/ground black pepper, Van der Graaff demo
6	Magnetic materials	6	Ppt slide 7 as a sheet, class set – bar magnets, selection of materials (iron, paper, rubber, nickel, wood, glass, copper, zinc, aluminium), paper clips, thread
7	Magnetic fields	7	Class set – bar magnets, plotting compasses, iron filings. Demo – navigational compass
8	Electromagnets	8	Class set – electromagnet wires, iron cores, assorted other cores (e.g. wood, plastic), box of paperclips, variable power supplies, leads, crocodile clips
9	Electromagnet uses	9	Electric bell diagram Motor kits, variable power supplies (small grey ones are good for this)
10	Assessment	10	Quiz sheet Assessment sheet

Supportive Reading:

Comprehension activity	TBC
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Assessment:

Knowledge:	20 question multiple choice quiz
Application of Knowledge:	Extended writing task evaluating the use of an energy resource