Topic 6: Magnets

What's the science story?

This topic can be one of the most engaging. Please get out our stock of supermagnets (making sure you know exactly who is responsible for handing them back in to you at the end of the lesson) and try loads of extra experiments.
Look at the previous knowledge – they did all the stuff we usually do in year 8 in year 3!

Previous knowledge:

In YEAR 3
notice that some forces need contact between two objects, but magnetic forces can act at a distance
observe how magnets attract or repel each other and attract some materials and not others
compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
describe magnets as having two poles
predict whether two magnets will attract or repel each other, depending on which poles are facing.

Next steps…

Exactly the same in KS4 +
Induced magnetism
Direction of magnetic fields and where they are strongest
Evidence the core of the Earth is magnetic
The word 'solenoid'

Higher tier: Fleming's left hand rule
Explaining how a motor works

Keywords

magnetism
repulsion
non-magnetic
magnetic
attraction
poles
compass
field line
north-seeking pole
south-seeking pole
navigation
core
electromagnet
motor
variable
independent
dependent
control

Lesson No. and Title	Learning objectives	National Curriculum	Working scientifically skills	Practical equipment
1. Magnetism – year 3 reminder	see ARE for year 3 above	magnetic poles, attraction and repulsion		magnets iron filings thread
2. Magnetic fields	ARE Accurately plot the magnetic field of a bar magnet AGD Compare magnetic field lines and a magnetic field	magnetic fields by plotting with compass, representation by field lines		Demo: plastic covered iron filings in liquid apparatus Compass Pencil Plain paper Bar magnet x 2 Iron filings
3. The Earth's magnetic field	ARE Describe the Earth's magnetic field AGD Explain how a compass works	Earth's magnetism, compass and navigation		Bar magnet Thread and card to make hanging magnet holder compass
4. Electromagnets	ARE Describe how to change the strength of an electromagnet AGD Explain how an electromagnet works	the magnetic effect of a current, electromagnets		Demo: several compasses Power pack Thick wire Stiff cardboard Iron filings Class: iron nail Insulated wire Power pack, Leads with crocodile clips paperclips

KS3 – Year 8

5. Motors	ARE Describe how a simple motor works AGD Apply knowledge about electromagnets to design a circuit	DC motors (principles only)		motor kits
6. Investigating electromagnets	ARE Find out how much one factor affects the strength of an electromagnet AGD Compare the affect of two different factors on the strength of an electromagnet	**investigation**		Class: iron nail Insulated wire of different thicknesses Power pack Leads with crocodile clips paperclips
Assessment 1: Electromagnets				

Assessment Criteria

Assessment No. & Title	Working Towards	Age Related Expectations	At Greater Depth
n/a	Draw the magnetic field lines around a bar magnet	Describe the Earth's magnetic field	Compare magnetic field lines and a magnetic field. Explain how a compass works.
1. Electromagnets	State the main features of an electromagnet	Describe how to change the strength of an electromagnet	Explain how an electromagnet works
	State some uses of electromagnets		
n/a	State the main parts of a motor.	Describe how a simple motor works	Apply knowledge about electromagnets to design a circuit.