Ravens Wood School

KS3 Curriculum Plan

Subject: Year 7 Magnets and Electromagnetism

Prior Key stage 2 Knowledge			
Forces and Magnets - Notice that some forces need contact between 2 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 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.			
Overarching Topic: Magnets and Electromagnetism			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	• Magnets are essential in today's electronic technology. Magnets are useful, fun and even a little mysterious--they can repel as well as attract. What do a wrecking yard, a rock concert and your front door have in common? They each use **electromagnets**, devices that create a magnetic field through the application of electricity. Wrecking yards employ extremely powerful electromagnets to move heavy pieces of scrap metal or even entire cars from one place to another. Your favorite band uses electromagnets to amplify the sound coming out of its speakers. And when someone rings your doorbell, a tiny electromagnet pulls a metal clapper against a bell. • This unit builds on work done in unit 3E 'Magnets and springs' in the key stage 2 scheme of work. Yr 7 Fundamentals of energy would have introduced energy transformations. Producing electromagnets is an example of transforming chemical energy in a fossil fuel (power station) or within a battery to magnetic energy. This energy would be transferred electrically. It also links in with current in Year 8 and Magnetism and Electromagnetism at KS4.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	Which materials are magnetic? What do opposite and like poles do when they come into close contact? Is magnetism a contact or non-contact force? What is the difference between temporary and permanent magnet?	What is a magnetic field and how do I investigate one? Explain three factors about a magnet that magnetic field lines indicate? What is an electromagnet and how do I build one? What are the three ways I can increase the strength of an electromagnet? How do I build a DC motor?	L1 Why does Earth have a magnetic field and Mars does not? L2 Why do magnets lose their magnetism as they get older? L3 On a cloudy night, how does Bear Grylls find his way home? L4 Are there electromagnets in nature? L5 Why do cranes not use magnets? L6 How do hover trains hover?
The Key Skills/ Techniques	**The sophistication and application of skills will become more advanced as students' progress through the essential, core and ambitious knowledge.**		
	Skill/Technique	**How will this skill be developed?**	
	1. Graphing & Drawing	Draw graphs with suitable scales, axes and units. Correct line of best fit. Appreciation of anomalies and processed data. Scientific drawing of cells, concepts and scientific equipment.	
	2. Variables	Identify independent, dependent and control variables and devise experiments to include these to ensure valid results. Appreciation of uncertainty.	
	3. Data Analysis	Describe, explain and predict trends. Graph and table data interpretation. Identify links and patters within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.	
	4. Application	Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.	
	5. Working Scientifically	Identify hazards and planning to limit risk. Describe how to improve accuracy/precision/repeatability/reproducibility/validity. Evaluate reliability of methods and investigations, taking in to account data analysis.	