'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Magnetism and Electromagnetism

Curriculum Intent	
Skills/National Curriculum Links	**In addition to working further on objectives from Year __, pupils will be taught, following National Curriculum guidelines, the following this topic:** - magnetic poles, attraction and repulsion - magnetic fields by plotting with compass, representation by field lines - Earth's magnetism, compass and navigation - the magnetic effect of a current, electromagnets, D.C. motors (principles only)
Spiritual, moral, social, and cultural development	**SMSC:** Safe working and using the forces model. The importance of magnetism in real life. Students will reflect on their experiences and apply their understanding to a range of issues. Students will be encouraged to be reflective about their own beliefs and those of others and compare different people's faiths, feelings and values in order to develop their own perspective on life. Students will explore how Science influences the next stage of their education and/or employment. **PSHE/British Values:** learn about the magnets and every day uses of magnets and electro-magnets **Skills Builder:** Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork
Numeracy	drawing and interpreting graphs, using a formula.
Literacy	**Vocabulary Tier 2:** feature, record, interact, compare, observe, justify, applications **Vocabulary Tier 3:** magnet, bar magnet, magnetic field, field lines, compass, electromagnet, permanent magnet, wire, solenoid, current, electric bell, circuit breaker, **Reading:** Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle. **Writing:** Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation. **Oracy:** inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.
Becoming future ready	**Careers/Employability:** - *Scrapyard worker* - *MRI technician* - *Motor Electrician*
Adaptation	Throughout this topic, quality first teaching will provide differentiation:

QFT/SEND Provision	**By product:** Linear assessments and differentiated practical work. **By resource:** Lessons are differentiated per class and students, worksheets are coloured blue if support and assessments are linear. **By Intervention**: by providing different levels of supervision and support **By Progressive Questioning:** exploring pupils' understanding through interactive dialogue. **By Grouping:** according to prior attainment, gender, social preference, preferred learning style. **By Task:** Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range. **By Offering Optional Activities:** In class or as homework, to extend learning. This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.
Implementation Curriculum Delivery **Learning Outcomes (Core Knowledge)**	To be able to: *Know* *- Describe features of a magnet.* *- Draw the magnetic field lines around a bar magnet.* *- State the Earth has a magnetic field.* *- Record the shape of field lines round a magnet.* *Apply* *- Describe how magnets interact.* *- Describe how to represent magnetic fields.* *- Describe the Earth's magnetic field.* *- Draw field lines round a magnet in detail.* *Extend* *- Explain how magnets can be used.* *- Compare magnetic field lines and a magnetic field.* *- Explain how a compass works.* *- Suggest improvements to an experiment to observe field lines around a magnet.*
	Know *- State the main features of an electromagnet.* *- State one difference between permanent magnets and electromagnets.* *- State where the magnetic field due to a wire or solenoid is strongest.* *- Test the effect of changing an electromagnet.* *Apply* *- Describe how to make an electromagnet.* *- Describe how to change the strength of an electromagnet.* *- Describe how the magnetic field strength due to a current carrying wire varies with distance from the wire.* *- Predict and test the effect of changes made to an electromagnet.* *Extend* *- Explain how an electromagnet works.* *- Predict the effect of changes on the strength of different electromagnets.* *- Suggest how two wires both carrying currents placed next to each other might behave.* *- Predict the effect of changes made to an electromagnet, using scientific knowledge to justify the claim.*
	Know *- State some uses of electromagnets.* *- State the main parts of an electric bell, circuit breaker, or loudspeaker.* *- Ask simple questions about electric bells, circuit breakers, or loudspeakers.* *Apply* *- Describe some uses of electromagnets.* *- Describe how an electric bell, circuit breaker, or loudspeaker works.* *- From your experiment, pose scientific questions to be investigated.* *Extend* *- Apply existing knowledge about electromagnets to design a circuit.* *- Compare and contrast electric bells, circuit breakers, and loudspeakers.* *- Suggest investigations about electromagnets used in different applications.*
Current learning to be developed in the future within:	***Before:*** *At KS2 you will have covered an understanding of materials by exploring and comparing the properties, you should have also explored changes that are difficult to reverse, for example, burning, rusting and other reactions,*
	Future: *At GCSE you learn in more detail about functional uses of magnets, how electromagnets work and their uses such as school bells.*

Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.