Science – Physics

MAGHULL HIGH SCHOOL – CURRICULUM MAP

	Lessons Sequence					
TOPIC (S) **Magnetism**	1. Permanent and induced magnets 2. Magnetic fields 3. Electromagnetism		4. Flemings left hand rule 5. The motor effect 6. **Loud speakers**		7. **Induction** 8. **Generator effect** 9. **Transformers**	
Knowledge & Skills development	• Describe the attraction and repulsion between like and unlike poles for permanent magnets • Describe the difference between permanent and induced magnets • Know how to plot the magnetic field pattern of a bar magnet using a compass • Draw the magnetic field pattern of a bar magnet • Be able to explain how the behaviour of a magnetic compass is related to evidence that the Earth's core is magnetic • Describe the factors that affect the size of a force on a conductor • Describe how the magnetic effect of a current can be demonstrated • Draw the magnetic field pattern for a straight wire carrying a current and for a solenoid • Be able to explain how a solenoid arrangement can increase the magnetic effect of a current • Describe the factors that affect the size of a force on a conductor • Explain how a moving-coil loudspeaker and headphones work • Recall the factors that affect the size of the induced potential difference/induced current			• Recall the factors that affect the direction of the induced potential difference/induced current • Apply the principles of the generator effect in a given context • Explain how the generator effect is used in an alternator to generate ac and in a dynamo to generate dc • Draw/interpret graphs of potential difference generated in the coil against time • Explain how a moving-coil microphone works • Explain how the effect of an alternating current in one coil in inducing a current in another is used in transformers • Explain how the ratio of the potential differences across the two coils depends on the ratio of the number of turns on each • Calculate the current drawn from the input supply to provide a particular power output • Apply the equation linking the pds and number of turns in the two coils of a transformer to the currents and the power transfer involved, and relate these to the advantages of power transmission at high potential differences**.**	
Assessment / Feedback Opportunities	Targeted questioning throughout topic	Teacher assessment of practical skills during investigation - verbal	Knowledge Recall Quizzes	Deep marking of written task in students books	Topic Test	Targeted exam questions – teacher or self-assessed
Cultural Capital	• Opportunity to design and make a model of an electromagnet for use in a breakers yard					

SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**	• Working as part of a team while designing and making model electromagnet • Listening to others during presentations • Working in groups during practical work or research tasks
Reading opportunities	• Recommended Read: Magnetism: A Very Short Introduction (Stephen J Blundell) • Recommended Read: Horrible Science books • Recommended Read: All About Physics (Richard Hammond) • Recommended Read: Storm in a Teacup: The Physics of Everyday Life (Helen Czerski)
Key Vocabulary	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest Induced Magnet , Permanent magnet, magnetic field, poles, electromagnet, force, uniform, flux density, solenoid,
Digital Literacy	SharePoint resources including topic quizzes, Possible use of excel to plot graphs and analyse data, powerpoint, word, etc to present information, internet for research
Cross-Curricular Links	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators, angles, use of protractors
Careers	MRI/Other instrument technicians, Maglev (magnet train) worker, Electric Technicians, Scientists