

Curriculum Map for Physics

YEAR 8

What are the intended aims for this year's curriculum?											
To explain the effects and uses of energy.											
To describe different forces and explain their effects.											
Draw and interpret tables and graphs, recognise and use equations and use basic equipment confidently.											
Term 1		Term 2		Term 3		Term 4		Term 5		Term 6	
Topic(s):	Aim of A&R	Topic(s):	Aim of A&R	Topic(s):	Aim of A&R	Topic(s):	Aim of A&R	Topic(s):	Aim of A&R	Topic(s):	Aim of EoY exam
Energy		Waves		Electricity		Magnets/Static electricity		Forces		Motion	
How do we use energy?		Do all waves behave the same?		How does electricity behave in different settings?		How do objects move without touching?		Are all forces the same?		How do forces change motion?	
Knowledge to be learnt	Energy in food Energy in burning fuels Calculating the cost of energy Concept of wasted energy Simple machines	Types of waves Superposition of waves Refraction of light Lenses Pressure waves and their uses Waves in matter	Assess learning from the term and overall progress	Describing potential difference. Measuring potential difference. Potential difference in series and parallel. Measuring resistance in different wires. Comparing resistance of conductors and insulators.	Assess learning from the term and overall progress	Magnetic fields Electromagnets Motors Use and explanation of Van der Graff generators.	Assess learning from the term and overall progress	Non-contact forces Gravity Weight Forces in space Explaining days, years and seasons	Assess learning from the term and overall progress	Forces needed to stop or start movement. Forces needed to change speed or direction. Motion changing due to size and direction of force. Atmospheric pressure. Pressure in liquids. Measuring pressure.	Assess progress from the year
Key vocabulary	Energy, joule, kilojoule, calorie, dissipation	Transverse, Longitudinal, Superposition, Reflection, Refraction, Convex, Incidence, Normal, Diffraction, Ultrasound		Potential difference, voltage, voltmeter, ohm, resistor, conductor, insulator.		Field, electromagnet, motor, charge.		Gravity, weight, mass, light-year, galaxy, star, hemisphere, solar system.		Velocity, displacement, stationary, accelerating, pressure, air resistance, upthrust, floating, sinking	
The role of reading and comprehension	Activities could include: Describing and explaining conclusions from practical work. Describing diagrams. Comparing and contrasting similar concepts	Activities could include: Describing the uses of waves. Interpreting exam questions. Converting diagrams into written descriptions.		Activities could include: Turning circuit descriptions into diagrams. Interpreting exam questions.		Activities could include: Following instructions to build an electromagnet. Following instructions to build a motor.		Activities could include: Interpreting exam questions.		Activities could include: Turning descriptions of motion into diagrams. Understanding how to measure force. Interpreting questions	
The role of independent extended writing	Activities could include: Use of food diaries to compare energy consumption.	Activities could include: Comparing uses of different waves. Comparing the eye to pinhole cameras. Descriptions for carrying out investigations into light waves.		Activities could include: Explain the difference between conductors and insulators.		Activities could include: Writing instructions to make an electromagnet/motor. Explain how a Van der Graff generator works		Activities could include: Explaining the structure of the solar system. Explaining days, years and seasons.		Activities could include: Explaining the effect of forces shown in force diagrams. Explaining the effects of different types of pressure.	
The role of maths/ numeracy	Power/Energy/Cost calculations. Moment calculations. Graphs.	Angles/protractor skills. Drawing appropriate tables.		Use and interpretation of graphs. Calculating averages. Calculate resistance.		Use and interpretation of graphs Drawing appropriate tables		Working with different number prefixes.		Use and manipulation of equations. Accurate measurement of forces.	
Links to careers/ aspirations	Electrical engineering Dietician Construction Civil engineering	Midwifery Optometry Seismology Sound technician		Electrician Computing Electrical engineering Communication engineering		Engineering (multiple fields) Meteorologist		Astronaut Space engineer Flight engineer Meteorology Cosmology		Games designer Graphic designer VFX specialist Sports coach Car mechanics/engineering	
Core skills	To be able to: Investigate the energy in food. Measuring energy transfers in numerous situations.	To be able to: Investigating reflection, refraction and diffraction. Investigating pin hole cameras.		To be able to: Build circuits. Measure potential difference accurately. Determine how wire characteristics influence resistance.		To be able to: Describe how to find a magnetic field Make electromagnets Make a simple motor Relate ideas about static to everyday examples.		To be able to: Describe the effects of different non-contact forces. Explain links between mass and weight. Describe the effects of forces in space Explain days, years and seasons.		To be able to: Explain why objects stop moving, start moving, change speed and change direction. Describe pressure in different situations	
Dept. enrichment activities	I'm an engineer activity. Lego robots STEM							Big bang fair		Big bang fair	
Home learning opportunities	Activities could include: Food diaries. Electricity bills in the home. Investigating see-saws in the local park.	Activities could include: Uses of waves around the house or local area. Creating an eye model. Demonstrating superposition of waves at home or at the seaside.		Activities could include: Create models to explain different aspects of electricity.		Activities could include: Find electromagnets around the home. Create a home-made electromagnet/motor. Investigate the creation of static electricity.		Activities could include: Create a model solar system. Create a model to explain days, months or years.		Activities could include: Investigate air resistance using cupcake cases. Find objects around the home that make use of increasing/decreasing pressure.	

								Design a machine to help walk on water.
Lessons and Learning Objectives	<p>Lesson 1 - Energy in fuels LO: To compare the energy in different fuels Stretch LO: To calculate the amount of energy that a fuel releases</p> <p>Lesson 2 - Energy in foods LO: Compare the energy values of different foods Stretch LO: Compare energy intake vs energy expenditure</p> <p>Lesson 3 & 4- Investigating fuels LO: To investigate the energy stored in different fuels Stretch LO: To compare and explain results from the investigation</p> <p>Lesson 5 - Energy costs LO: To calculate the cost of using energy Stretch LO: To compare the cost of different appliances</p> <p>Lesson 6 - Energy dissipation LO: To describe what energy dissipation is Stretch LO: To calculate useful and wasted energy for an appliance</p> <p>Lesson 7 – Turning moments LO: To calculate turning moment in a number of given situations. Stretch LO: Rearrange the moment equation and apply it to unknown situations.</p>	<p>Lesson 1 - Types of waves LO: Compare how different waves transfer energy Stretch LO: Describe the link between amplitude or frequency and energy.</p> <p>Lesson 2 - Superposition Describe what happens when waves superpose Stretch LO: se wave models to explain observations of wave behaviour</p> <p>Lesson 3 - Waves in matter LO: To investigate how wave speed changes in different matter Stretch LO: Compare the speed of sound in different matter</p> <p>Lesson 4 - Pressure waves LO: To describe the uses of pressure waves Stretch LO: To explain the advantages of using pressure waves</p> <p>Lesson 5 - Refraction LO: To describe what happens to light when it passes through materials of different densities Stretch LO: To draw ray diagrams to show refraction of light</p> <p>Lesson 6 - Lenses LO: To describe how lenses affect the pathway of light Stretch LO: To explain the uses of lenses</p>	<p>Lesson 1 - Introducing Potential difference LO: To describe potential difference Stretch LO: To explain the difference between current and potential difference</p> <p>Lesson 2 - Measuring potential difference LO: To observe the effect of increasing potential difference in a simple circuit Stretch LO:</p> <p>Lesson 3 - Potential difference in series and parallel LO: To investigate potential difference in series and parallel circuits Stretch LO: To explain the rules for potential difference in series and parallel circuits</p> <p>Lesson 4 - Resistance LO: To describe resistance in a circuit Stretch LO: To calculate resistance using current and potential difference</p> <p>Lesson 5 - Resistance in a wire LO: To investigate resistance in different wires Stretch LO: To explain why resistance varies</p> <p>Lesson 6 - Resistance in conductors and insulators LO: To describe the difference between conductors and insulators Stretch LO: To explain why some materials</p>	<p>Lesson 1 - Magnetic fields LO: To describe magnetic fields Stretch LO: To use ideas about magnetic fields to explain how a compass works</p> <p>Lesson 2 - Electromagnetic induction LO: To describe the connection between magnets and electricity Stretch LO: To explain the uses for electromagnetic induction</p> <p>Lesson 3 & 4 - Electromagnets LO: Describe how to make an electromagnet Stretch LO: Explain how you can make an electromagnet stronger</p> <p>Lesson 5 - Motors LO: To describe how an electric motor works Stretch LO: To explain the practical applications of electric motors</p> <p>Lesson 6 - Electric fields (Van der Graff) LO: To describe how electric field forces can act across space between objects Stretch LO: To explain how a Van der Graff generator works.</p>	<p>Lesson 1 - Non contact forces LO: Explain how forces interact Stretch LO: Give examples of non-contact forces</p> <p>Lesson 2 & 3 - Gravity LO: State the value of gravity on Earth and on the moon Stretch LO: Explain how gravitational force varies with mass and distance</p> <p>Lesson 4 - Weight LO: Describe the difference between mass and weight Stretch LO: To describe the effect of gravity on mass and weight</p> <p>Lesson 5 - Forces in space LO: Explain why objects stay in orbit Stretch LO: Explain how to change the orbit of an object</p> <p>Lesson 6 - Days, years and seasons LO: to explain how days, years and seasons occur Stretch LO: to compare days, years and seasons in the northern and southern hemisphere</p>	<p>Lesson 1 - Forces needed to stop and start movement LO: Describe what happens when the resultant force on an object is not zero Stretch LO: use force diagrams to describe situations that are in equilibrium</p> <p>Lesson 2 - Forces needed to change speed or direction LO: to predict how the motion of an object will change depending on the direction of the force acting on it Stretch LO: to apply this knowledge to real life situations</p> <p>Lesson 3 - Changes in motion LO: Describe how an objects speed and direction changes when a force acts on it Stretch LO: describe the effect of surface area on changes in motion</p> <p>Lesson 4 - Atmospheric pressure LO: Describe how fluids exert a pressure in all directions Stretch LO: Explain why fluids exert a pressure</p> <p>Lesson 5 - Pressure in liquids LO: Describe how liquid pressure changes with depth Stretch LO: Explain why liquids exert a pressure</p> <p>Lesson 6 - Measuring pressure LO: Explain how to calculate pressure Stretch LO: Explain how to calculate pressure in different situations</p>		