



Curriculum Map

Subject: Triple Science (Physics)

(Separate Science Content is in RED)

Year Group: 10

Content	Autumn 1/Autumn 2	Autumn 2/Spring 1	Spring Term	Spring Term 2/Summer Term
	<p>1 Review Year 9 Topics 2 Energy Transfer By Heating Conductors and insulators Thermal conductivity Specific heat capacity Heating and insulating houses</p> <p>Ch12: Wave Properties Review of Combined Science content from Year 9 Sound Waves, the ear and echo sounding Uses of Ultrasound Seismic Waves – analysing seismic waves and learning about the Earth's structure</p> <p style="color: red;">Ch14 Light Reflection of light Real and virtual images Specular and diffuse reflection Refraction of light Understand what determines the colour of surfaces Understand how wavelength of light</p>	<p>1 Energy Resources National and global energy resources. Advantages and disadvantages of specific renewable and non-renewable energy sources Supply and demand – how energy supply is managed to meet variations in demand</p> <p style="color: red;">Ch2 Energy Transfer by Heating Understand what infra red radiation is Understand how infra red radiation depends on temperature Absorption and emission of infra red radiation</p>	<p>1 Molecules and Matter -Density of materials -Changes of state -Internal energy -Temperature changes in a system and specific heat capacity -Changes of heat and specific latent heat -Particle motion in gases</p> <p style="color: red;">Ch6 Gas Pressure and volume Understand how pressure or volume change affect gases Understand why the pressure of a gas changes when its volume changes at constant temperature Understand why the temperature of a gas increases when it is compressed quickly. Know Boyle's Law</p>	<p>Forces in Balance 1. Scalar and Vector quantities 2. Contacts and Non-contact forces 3. Gravity and Weight 4.Resultant Forces 5. Forces and Elasticity 6. Moments, lever and gears 7. Pressures, pressure in fluids and atmospheric pressure (HT only content within lesson - archimedes principle) 8. Atmospheric pressure</p> <p>Motion 9. Distance and Displacement 10. Speed and Velocity 11. Distance-time graphs 12. Acceleration and Velocity-time graphs and equations of motion (HT only content within lesson - area under graph)</p> <p>Forces in Motion Newton's 1st, 2nd and 3rd Law's Braking distances Momentum</p> <p style="color: red;">Ch8 Forces in Balance What are moments? What does the moment of a force measure? Why are levers so useful? Levers as force multipliers Gears – what they are and how they work Identify the forces that can turn an object around a fixed point either clockwise or anticlockwise</p> <p style="color: red;">Ch10 Forces and Motion Using conservation of momentum Explain why two objects that push each other apart move away at different speeds</p>

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	<p>changes across the visible spectrum</p> <p>Convex and concave lenses</p> <p>Real and virtual images</p>			<p>Explain what happens to the total momentum of an object when two objects collide</p> <p>Impact forces</p> <p>Explain what can be said about the impact forces and the total momentum when two vehicles collide</p> <p>Explain why an impact force depends on the impact time</p> <p>Explain why safety devices like helmets and cushioned surfaces reduce impact forces</p> <p>Explain how safety devices such as seat belts, air bags, side impact bars and crumple zones work</p> <p>Ch11 Forces and Pressure</p> <p>What is pressure?</p> <p>Pressure equation</p> <p>Pressure in liquids</p> <p>Atmospheric pressure</p> <p>Upthrust and flotation</p>
Skills	<p>Understand how heat energy is transferred</p> <p>Measure and calculate specific heat capacity</p> <p>2. Investigate thermal conductivity using rods of different materials. 3. an investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work</p>	<p>Compare the advantages and disadvantages of different renewable and non-renewable energy resources</p> <p>Give simple explanations of how different renewable energy resources produce electricity.</p> <p>Explain in simple terms how a non-renewable power station works.</p> <p>Give a simple explanation of how nuclear power is</p>	<p>Equation application 1. Recall and apply equations for; density, specific heat capacity, specific latent heat, Practical Experiments 1. Perform an experiment to determine the densities of regular and irregular solid objects and liquids. 2. Perform an experiment to measure the latent heat of fusion of water.</p> <p>Ch6 Molecules and Density</p> <p>Practical investigations on pressure and volume</p> <p>Calculations using Boyle's Law</p>	<p>Equation application 1. Students should be able to recall, apply and link the equations for: weight, extension applied, force applied, elastic potential energy, moments, pressure, speed, acceleration, change in velocity, acceleration and displacement, force, mass and acceleration and momentum Practical Experiments 1. Investigate the relationship between force and extension for a spring. 2. Investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of varying the mass of an object on the acceleration produced by constant force</p> <p>Ch8 Forces in balance</p> <p>Calculate the moment of a force</p>

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	<p>done) to the increase in temperature and subsequent increase in thermal energy stored.</p> <p>Ch12 Waves Investigating different sounds Compare the properties of different sound waves Calculate depth of water using echo sounding data Calculations using ultrasound data Compare different seismic waves and use them to determine properties of the earth</p> <p>Ch14 Light Draw accurate ray diagrams Investigate refraction Apply the laws of reflection and refraction Use experimental techniques to test a variety of surfaces and determine their colour in differently lit situations Use convex and concave lenses, use ray diagrams to show their properties Calculate magnification</p>	<p>used to generate electricity.</p> <p>Ch2 Energy Transfer by Heating Experimental techniques to detect infra red radiation Analyse and interpret black body radiation graphs Apply understanding of infra red radiation to explain how the earth's temperature changes</p>		<p>Investigate the turning effect of a force Investigate wheels and axes Investigate and work out centre of mass of different objects Identify the forces that can turn objects around a fixed point Calculate the size of a force (or its perpendicular distance from a pivot) acting on an object that is balanced.</p> <p>Ch10 Forces and Motion Apply conservation of momentum to different collisions Momentum calculations Calculate impact time in collisions Analyse the effectiveness of different safety devices in vehicles</p> <p>Ch11 Forces and Pressure Use the pressure calculation Apply understanding of pressure to different situations Calculate the pressure caused by a liquid column Calculate the force on a flat object due to pressure differences Understand why the atmosphere exerts a pressure Decide whether an object will float or sink Practical investigations on upthrust Practical density tests</p>

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	Find the position and nature of an image formed by a lens			
Key questions	<p>What are conductors and what are insulators? Why are both types of material useful?</p> <p>What is specific heat capacity and how can we investigate it?</p> <p>How are buildings heated and insulated efficiently?</p> <p>Ch12 Wave Properties</p> <p>What affects the loudness of a musical note?</p> <p>How do our ears detect sound waves?</p> <p>Why is human hearing limited to a certain range of sound frequencies?</p> <p>What is echo sounding?</p> <p>How are ultrasound waves used in medicine and in industry?</p> <p>Why are ultrasound scans safer than x-rays?</p> <p>What are the different seismic waves and what can they tell us about the Earth's structure?</p> <p>Ch14 Light</p>	<p>What different energy resources are available?</p> <p>How are these resources used to generate electricity?</p> <p>What are the advantages and disadvantages of different types of renewable and non-renewable energy resources?</p> <p>What are the big energy issues that society needs to resolve?</p> <p>Ch2 Energy transfer by heating</p> <p>What is meant by black body radiation?</p> <p>What happens to the temperature of an object if it absorbs more radiation than it emits?</p> <p>How is the temperature of the Earth affected by the balance of absorbed and emitted radiation?</p>	<p>What is density and how can we measure it?</p> <p>How can we use the kinetic theory of matter to understand changes of state and properties of solids, liquids and gases?</p> <p>How can you find the melting point of a substance?</p> <p>What is latent heat and how can we measure it?</p> <p>What is gas pressure and how is it related to temperature?</p> <p>Ch6 Molecules and Matter</p> <p>Why does the pressure of a gas change when its volume changes at constant temperature?</p> <p>Why does the temperature of a gas increase when it is compressed quickly enough?</p>	<p>How do we represent forces and what is meant by a resultant force?</p> <p>How can you work out the effect of a resultant force on an object?</p> <p>What is the difference between vectors and scalars?</p> <p>What is the centre of mass of an object and how can we identify it?</p> <p>What is the parallelogram of forces and how do we use it?</p> <p>How can we resolve forces?</p> <p>How can we calculate speed?</p> <p>What can we find out from distance-time graphs?</p> <p>What is velocity?</p> <p>What can we find out from velocity-time graphs?</p> <p>What is acceleration and how can it be calculated?</p> <p>What is the relationship between the resultant force, an object's mass, and its acceleration?</p> <p>What is meant by inertia?</p> <p>What is the difference between weight and mass?</p> <p>What effect does gravity have on a falling object?</p> <p>What is terminal velocity?</p> <p>What is the relationship between the stopping distance, braking distance and thinking distance, and what factors affect them?</p> <p>What is momentum and how is it calculated?</p> <p>What is Hooke's Law and how do we investigate it?</p> <p>Ch8 Forces in balance</p>

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	<p>How are images formed in plane mirrors?</p> <p>What is meant by specular reflection and diffuse reflection?</p>			<p>What does the moment of a force measure?</p> <p>How can you increase the moment of a force?</p> <p>Why are levers force multipliers?</p> <p>What do gears do?</p> <p>How do gears give a bigger turning effect?</p> <p>What is the centre of mass of an object?</p> <p>How can you find the centre of mass of a symmetrical object?</p> <p>How can we use our knowledge of forces and moments to explain why objects at rest don't turn?</p> <p>Ch10 Force and Motion</p> <p>Why do two objects that push each other apart move away at different speeds?</p> <p>What happens to the total momentum of two objects when they collide?</p> <p>What factors affect the impact forces when two objects collide?</p> <p>Why does an impact force depend on the impact time?</p> <p>How can you work out if a car in a collision was speeding?</p> <p>Ch11 Force and Pressure</p> <p>What is meant by pressure?</p> <p>What does the pressure of a liquid depend on?</p> <p>How and why does atmospheric pressure change with altitude?</p> <p>How does the density of the atmosphere change with altitude?</p>

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Assessment	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range of methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range of methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities End of term summative assessments	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range of methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities End of term summative assessments	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range of methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities End of Year summative assessments
Literacy/ Numeracy/ SMSC/ Character	Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically.	Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically.	Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically.	Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically.