



Curriculum Map: Year 9 Physics

	Half Term 2	Half Term 2	Half Term 3	Half Term 4	Half Term 5
Topic	Energy and energy changes	Efficiency and National and global energy resources	Circuit diagrams and symbols. Series and Parallel circuits Resistance Required Practicals AC DC current	Electrical power and everyday appliances	Particle model of matter
Intent	To learn about the different types of energy and how energy transfers between systems, utilising relevant equations.	To develop an understanding of the main energy sources available to us on Earth, both renewable and non-renewable. Be able to calculate the efficiency of energy transfers.	To learn the standard circuit diagram symbols and use them to construct series and parallel circuit diagrams. Develop ability to build circuits and record measurements. To learn about resistors and their function in different components, applying knowledge to given situations in a graphical context. Develop knowledge of the 3-point plug and practical ability to rewire.	Students will learn about the components of the National grid and how electricity is supplied to the country. Then they will apply their knowledge to the use of electricity in everyday appliances and the energy transfers that occur.	Students will learn the role of particles in our universe, and how their arrangement can influence mass, density specific heat capacity and specific latent heat.
Key Knowledge	Energy can be in different forms. Energy transfer involves changes in form. Calculating energy, power and efficiency.	Calculating Efficiency. Fossil fuels are finite. Renewable energy sources can be replenished. Environmental impact of different energy sources.	Recall circuit symbols. Calculate charge flow. Describe the features of series and parallel circuits. How to calculate resistance in series and parallel circuits. Recall the resistance graphs and how resistance behaves in a filament lamp and a diode. The difference between direct and alternating current.	Calculate energy transferred by a domestic appliance using $E=Pt$ and $E=QV$ Explain how power of a device is related to the potential difference and current. Describe how electricity is transferred to consumers via the national grid.	The density of a material is defined by the equation: density = mass / volume Changes of state are physical changes which differ from chemical changes because the material recovers its original properties. If the change is reversed Internal energy is the total kinetic energy and potential energy of all the particles (atoms and molecules) that make up a system. Specific heat capacity can be calculated using the following equation: Change in thermal energy = mass × specific heat capacity × temperature change The specific heat capacity of a substance is the amount of energy required to raise the temperature of one kilogram of the substance by one degree Celsius.

					<p>The specific latent heat of a substance is the amount of energy required to change the state of one kilogram of the substance with no change in temperature.</p> <p>It can be calculated using.; energy for a change of state = mass × specific latent heat</p> <p>The molecules of a gas are in constant random motion.</p>
Key Skills	<p>Using formulas to calculate energy, power and efficiency.</p> <p>Interpret graphs and data tables.</p>	<p>Structure arguments about the rights and wrongs of new technology and how to tackle problems caused by human impact on the environment.</p> <p>Describe, explain and evaluate the use of different energy sources.</p> <p>Using formulas to calculate efficiency.</p>	<p>Draw and interpret circuit diagrams.</p> <p>Construct circuits using laboratory equipment.</p> <p>Calculations; rearranging and substituting values from given situations.</p> <p>Descriptive and comparative writing.</p> <p>Carry out required practical 15 and 16.</p> <p>Use models in explanations.</p> <p>Graph plotting and interpretation.</p>	<p>Calculations; rearranging and substituting values from given situations.</p> <p>Use data to describe and evaluate methods of energy transfer.</p> <p>Recognise, draw and interpret diagrams.</p> <p>Extended writing.</p>	<p>Recall.</p> <p>Rearranging equations.</p> <p>Practical techniques.</p> <p>Problem solving.</p> <p>Making accurate observations.</p> <p>Interpreting data from graphs to make appropriate conclusions.</p>
Key Vocabulary	<p>Energy, joule, kilojoule, law of conservation of energy, chemical store, energy store, thermal, kinetic, gravitational potential, elastic, dissipated, energy resource, fossil fuel, non-renewable, thermal power station, renewable, nuclear, power rating, watt, kilowatt, kilowatt hour, work done.</p>	<p>Efficiency, fossil fuel, nuclear fuel, hydro-electricity, solar, renewable, impact.</p>	<p>Series, parallel, cell, LED, ammeter, voltmeter, lamp, fuse, switch, diode, current, amperes, potential difference, resistance, circuit, conductor, directly proportional, components, neutral, live, earth.</p>	<p>Appliance, transfer, domestic, kinetic, electric, joules, watts, coulombs, national grid, transformer.</p>	<p>Mass, volume, density, solid, liquid, gas, condensing, freezing, boiling, specific heat capacity, energy, thermal, specific latent heat, particles, pressure.</p>

Key Reading	BBC bitesize GCSE Combined Science CGP revision guide	BBC bitesize GCSE Combined Science CGP revision guide	BBC bitesize GCSE Combined Science CGP revision guide	BBC bitesize GCSE Combined Science CGP revision guide	BBC bitesize GCSE Combined Science CGP revision guide
End Point	Students are competent in answering structured and longer response exam style questions and recall the scientific equations. Students can: describe energy changes; calculate energy changes, power and efficiency; describe ways to reduce energy loss; explain why fossil fuels are a non-renewable energy source and why alternative energy sources need exploring.	Students are competent in answering structured and longer response exam style questions and recall the scientific equations.	Students are competent in answering structured and longer response exam style questions and recall the scientific equations.	Students are competent in answering structured and longer response exam style questions and recall the scientific equations.	students are competent in answering structured and longer response exam style questions. Recall density, specific heat capacity and specific latent heat equations. Able to structure comparative sentences. Can recall practical methods Students are competent in answering maths, data and graph-based questions. Students can plot and analyse line graphs.
Form of Assessment	Exam Ready Questions	Exam Ready Questions DC1	Exam Ready Questions	Exam Ready Questions	Exam Ready Questions DC2
Enrichment Opportunities	As Universities start to offer science-based workshops again Y9 will be given the opportunity to take part. Linked with Duke of Edinburgh there is an opportunity for some students to gain hands on experience in a science career with a Science technician as part of their skills or volunteering section.				
Leadership Opportunities	Chances to formally present within lessons and take ownership of that process. Student helper to support other students especially in required practicals. Student example to demonstrate good quality work.				



AMBITION



RESILIENCE



COURTESY



KINDNESS