



# Curriculum map – Year 9 combined physics

YEAR X TOPIC(s)	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will know	<b>Energy</b>	<b>Energy</b>	<b>Energy</b>	<b>Energy</b>	<b>Electricity</b>	<b>Electricity</b>
	<p>The eight different energy stores, how they're increased or decreased and how energy is transferred between the different energy stores.</p> <p>A system is an object or a group of objects. A closed system is one that does not transfer energy to the surroundings.</p> <p>The equations for kinetic, gravitational potential and elastic potential energy. Power is the rate of energy transfer.</p>	<p>Work done is the energy transferred by a force overcoming friction.</p> <p>Energy is conserved. Some energy transfers are useful and some are wasted.</p> <p>Efficiency is a measurement of how much energy is transferred usefully.</p> <p>How to improve efficiency.</p>	<p>Thermal conductivity measures the rate of energy transfer through solid materials by conduction.</p> <p>Conductors have high thermal conductivity; insulators have low thermal conductivity.</p> <p>The ways in which energy losses from buildings are reduced.</p>	<p>Renewable and non-renewable energy resources, how each energy resource is used and the environmental impact of them.</p> <p>How the use of energy resources has changed over time.</p>	<p>Circuit symbols and the reason why we use them.</p> <p>The current is the rate of flow of charge.</p> <p>The charge is measured in Coulombs.</p> <p>Equation for calculating charge, current and time.</p> <p>Potential difference is a measure of the energy transferred per coulomb of charge between two points in a circuit.</p> <p>Resistance is the opposition to the flow of current.</p>	<p>Resistance is affected by: temperature, length of wire, material the wire is made out of, cross sectional area (thickness) of the wire.</p> <p>As length of wire increases, the resistance increases. Ohm's law states that current is directly proportional to resistance as long as temperature remains constant.</p> <p>The relationship between current and potential difference for: fixed resistor, filament lamp and diode.</p>

YEAR X	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
What students will be able to do	Describe changes between energy stores for given scenarios. Calculations of energy using suitable equations. Rearrange equations. Convert into standard units. Calculate power.	Calculate the work done by a force. Identify useful and wasted energy transfers. Calculate efficiency as a decimal and a percentage. Suggest ways to improve the efficiency of energy transfers by using thermal insulation or lubrication.	Identify materials based on thermal conductivity. Use a Bunsen burner and stopwatch to determine which materials have the highest thermal conductivity. Explain why certain building materials are chosen to minimize energy losses in buildings.	Identify energy resources as renewable and non-renewable. Evaluate the environmental impact of energy resources. Use data to explain trends in the use of energy resources.	Identify circuit symbols from circuit diagrams. Draw circuit symbols accurately, draw electric circuits. Build circuits from circuit diagrams. Calculate charge, current and time using the equation. Calculate potential difference, current and resistance using the equation. Use a voltmeter and ammeter correctly.	Use a power pack, voltmeter, ammeter and 1m of wire to identify the relationship between length of wire and resistance. Draw a graph of resistance and length of wire. Use a voltmeter, ammeter, filament lamp, fixed resistor, diode, rheostat and power pack to determine the relationship between current and potential difference. Draw a graph of current and potential difference. Calculate the gradient from a graph.
Beyond the classroom	Walter Lewin pendulum: <a href="https://www.youtube.com/watch?v=77ZF50ve6rs">https://www.youtube.com/watch?v=77ZF50ve6rs</a>	YouTube: <a href="#">Grand Designs Australia – S04E06 Forest Lodge Eco [Full Episode]</a>	National Grid live : <a href="https://grid.iamkate.com/">https://grid.iamkate.com/</a> <a href="#">The Energy Story – Chapter 20: Hydrogen and Future Energy Sources</a>  <a href="https://www.sciencejournalforkids.org/articles/how-can-we-turn-ocean-water-into-renewable-energy/">https://www.sciencejournalforkids.org/articles/how-can-we-turn-ocean-water-into-renewable-energy/</a>			