AQA GCSE Combined Science: Trilogy
Topic Checklists

6.2 Electricity

6.2.1 Current, Potential Difference and Resistance				
Topic	**Success Criteria**	**Progress**		
Standard Circuit Diagram Symbols	I can recognise and draw the standard symbols for: • switch (open) • switch (closed) • cell • battery • diode • resistor • variable resistor • LED • lamp • fuse • voltmeter • ammeter • thermistor • LDR			
	I can draw and interpret circuit diagrams.			
Electrical Charge and Current	I can state what is needed for electrical charge to flow in a circuit.			
	I can give a definition for electric current and describe what its size tells us about electrical charge.			
	I can recall and apply the correct equation to calculate charge flow.			
	I can rearrange the equation linking charge flow, current and time to calculate current or time.			
	I can compare the value of the current at any point in a single closed loop.			
Current, Resistance and Potential Difference	I can describe how the resistance and potential difference affect the current through a component.			
	I can recall and apply the correct equation to calculate the potential difference across a component.			
	I can rearrange the equation linking current, potential difference and resistance to calculate current or resistance.			
	I can use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits (required practical activity 15).			

Topic	Success Criteria	Progress		
Resistors	I can describe how the current through an ohmic conductor is related to the potential difference across the resistor.			
	I can describe what happens to the resistance of an ohmic conductor as the current through it changes.			
	I can describe how the current through a filament lamp is related to the potential difference across the resistor.			
	I can describe what happens to the resistance of a filament lamp as the temperature of the filament increases.			
	I can represent the relationship between the current through a diode and the potential difference across the resistor on a graph.			
	I can describe how the current flows through a diode.			
	I can describe what happens to the resistance of a diode when current flows in the reverse direction.			
	I can describe how the resistance of a thermistor changes as the temperature increases.			
	I can describe how thermistors can be used to control a circuit.			
	I can explain how the resistance of an LDR changes as light intensity changes.			
	I can describe how LDRs can be used to control a circuit.			
	I can explain the design and use of a circuit to measure the resistance of a component by measuring current through, and potential difference across, a component.			
	I can recognise and draw graphs that represent the relationship between the current and potential difference for: • an ohmic conductor; • a filament lamp; • a diode.			
	I can use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature (required practical activity 16).			

6.2.2 Series and Parallel Circuits				
Topic	**Success Criteria**	**Progress**		
Series and Parallel Circuits	I can state the two ways of joining electrical components in a circuit.			
	I can describe the current through components connected in series.			
	I can describe the potential difference across components connected in series.			
	I can describe the total resistance of two components connected in series and represent this as an equation.			
	I can describe the potential difference across components connected in parallel.			
	I can describe the current through components connected in parallel.			
	I can describe the total resistance of two components connected in parallel.			
	I can use circuit diagrams to construct and check series and parallel circuits that include a variety of common circuit components.			
	I can describe the difference between series and parallel circuits.			
	I can explain qualitatively why adding resistors in series increases the total resistance while adding resistors in parallel decreases the total resistance.			
	I can explain the design and use of dc circuits for measurement and testing purposes.			
	I can calculate the currents, potential differences and resistances in dc series circuits.			
	I can solve problems for circuits which include resistors in series using the concept of equivalent resistance.			

6.2.3 Domestic Uses and Safety				
Topic	**Success Criteria**	**Progress**		
Direct and Alternating Potential Difference	I can state whether mains electricity is an ac or dc supply.			
	I can recall the frequency of the UK mains electricity supply.			
	I can recall the potential difference of the UK mains electricity supply.			
	I can explain the difference between direct and alternating potential difference.			
Mains Electricity	I can recall the colour of the live wire in a three–core cable.			
	I can recall the colour of the neutral wire in a three–core cable.			
	I can recall the colour of the earth wire in a three–core cable.			
	I can state the purpose of the live wire.			
	I can state the purpose of the neutral wire.			
	I can state the purpose of the earth wire.			
	I can recall the potential difference between the live wire and earth.			
	I can explain that a live wire may be dangerous even when a switch in the mains circuit is open.			
	I can solve problems for circuits which include resistors in series using the concept of equivalent resistance.			

6.2.4 Energy Transfers				
Topic	**Success Criteria**	**Progress**		
Power	I can explain how the power transfer in a circuit device is related to the potential difference across it and the current through it.			
	I can recall and apply the equation linking current, potential difference and power to calculate the power transfer in a circuit device.			
	I can rearrange the equation linking current, potential difference and power to calculate the current or potential difference in a circuit device.			
	I can recall and apply the equation linking current, power and resistance to calculate the power transfer in a circuit device.			
	I can rearrange the equation linking current, power and resistance to calculate current or resistance in a circuit device.			
Energy Transfers in Everyday Appliances	I can explain how the power transfer in a circuit device is related to the energy transferred over a given time.			
	I can describe what affects the amount of energy an appliance transfers.			
	I can describe how different domestic appliances transfer energy from batteries or ac mains to electric motors or heating devices.			
	I can describe how charge causes work to be done in a circuit.			
	I can recall and apply the equation linking energy transferred, power and time to calculate the amount of energy transferred by electrical work.			
	I can rearrange the equation linking energy transferred, power and time to calculate the power or time.			
	I can recall and apply the equation linking charge flow, energy transferred and potential difference to calculate the amount of energy transferred by electrical work.			
	I can rearrange the equation linking charge flow, energy transferred and potential difference to calculate the charge flow or potential difference.			
	I can describe, with examples, the relationship between power ratings for domestic electrical appliances and the changes in stored energy when they are in use.			

Topic	Success Criteria	Progress		
The National Grid	I can name the parts that make up the National Grid.			
	I can describe the purpose of the National Grid.			
	I can explain the purpose of step–up transformers.			
	I can explain the purpose of step–down transformers.			
	I can explain why the National Grid system is an efficient way to transfer energy.			
	(HT only) I can apply the correct equation from the physics equation sheet linking the potential difference and current through the primary and secondary coils of a transformer.			