

ELECTRICITY CHECKLIST (AQA)

SPECIFICATION			
Basics of electricity			
Electric current as the rate of flow of charge; potential difference as work done per unit charge. $I = \Delta Q / \Delta t, V = W/Q$			
Resistance defined as $R = V/I$			
Current – Voltage characteristics			
Current-voltage characteristics for an ohmic conductor, semiconductor diode, and filament lamp. <i>Remember that questions can be set where either I or V is on the horizontal axis of the characteristic graph.</i>			
Ohm's law as a special case where $I \propto V$ under constant physical conditions.			
<i>Unless specifically stated in questions, ammeters and voltmeters should be treated as ideal (having zero and infinite resistance respectively).</i>			
Resistivity			
Resistivity $\rho = RA/L$			
Description of the qualitative effect of temperature on the resistance of metal conductors and thermistors. Only negative temperature coefficient (ntc) thermistors will be considered.			
Applications of thermistors to include temperature sensors and resistance–temperature graphs.			
Superconductivity as a property of certain materials which have zero resistivity at and below a critical temperature which depends on the material.			
Applications of superconductors to include the production of strong magnetic fields and the reduction of energy loss in transmission of electric power. <i>(Critical field will not be assessed)</i>			
Required practical 5: Determination of resistivity of a wire using a micrometer, ammeter and voltmeter.			

Circuits			
Resistors: <i>in series, $R_T = R_1 + R_2 + R_3 + \dots$</i> <i>in parallel, $1 / R_T = 1 / R_1 + 1 / R_2 + 1 / R_3 + \dots$</i>			
Energy and power equations: $E = IVt$ $P = IV = I^2R = V^2/R$			
The relationships between currents, voltages and resistances in series and parallel circuits, including cells in series and identical cells in parallel.			
Conservation of charge and conservation of energy in dc circuits			
Potential Divider			
The potential divider used to supply constant or variable potential difference from a power supply.			
Examples should include the use of variable resistors, thermistors, and light dependent resistors (LDR) in the Potential Divider <i>The use of the potentiometer as a measuring instrument is not required.</i>			
Terminal pd: $V = E / Q$ emf: $\mathcal{E} = I (R + r)$ <i>Students will be expected to understand and perform calculations for circuits in which the internal resistance of the supply is not negligible.</i>			
Required practical 6: Investigation of the emf and internal resistance of electric cells and batteries by measuring the variation of the terminal pd of the cell with current in it.			