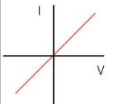
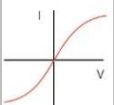
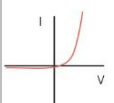
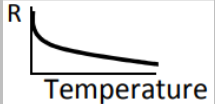
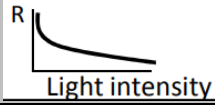



1 – Key Definitions	
<b>Current</b>	Rate of flow of <b>charge</b> . Units = <b>amps (A)</b> . Measured with an <b>ammeter</b> connected in <b>series</b> .
<b>Potential difference (voltage)</b>	<b>Energy</b> transferred per unit <b>charge</b> . Units = <b>volts (V)</b> . Measured with a <b>voltmeter</b> connected in <b>parallel</b> .
<b>Resistance</b>	Measure of how <b>difficult</b> it is to pass a <b>current</b> through a component. Units = <b>ohms (<math>\Omega</math>)</b> .
<b>Power</b>	<b>Rate of energy transfer</b> . Units = <b>watts (W)</b> .
<b>Charge</b>	Transferred by <b>electrons</b> . Units = <b>coulombs (C)</b> .
2 – Series Circuits (only one loop)	
<b>Current rule</b>	Current is the <b>same</b> in <b>all parts</b> of the circuit.
<b>P.D. rule</b>	P.D. of the cell/battery is <b>shared</b> between the <b>components</b> .
<b>Resistance rule</b>	Total resistance found by <b>adding</b> up resistance of <b>each component</b> .
3 – Parallel Circuits (more than one loop)	
<b>Current rule</b>	Current <b>splits</b> between loops.
<b>P.D. rule</b>	<b>Each loop</b> gets the <b>total P.D.</b> from the cell/battery.
<b>Resistance rule</b>	Total resistance is <b>lower</b> than the <b>loop</b> with the <b>lowest resistance</b> .
4 – Electricity Equations	
$Q = I \times t$	Charge = current x time
$V = I \times R$	Potential difference = current x resistance
$V = E / Q$	Potential difference = energy transferred / charge
$E = P \times t$	Energy transferred = power x time
$P = I \times V$	Power = current x potential difference
$P = I^2 \times R$	Power = current <sup>2</sup> x resistance

5 – I-V Characteristics	
<b>Ohmic conductor</b>	Current is <b>directly proportional</b> to <b>potential difference</b> , e.g. resistor at constant temperature. 
<b>Filament lamp</b>	As <b>current increases</b> , <b>temperature increases</b> -> <b>resistance increases</b> -> <b>harder for current to flow</b> -> <b>non-ohmic</b> . 
<b>Diode</b>	Current <b>only flows</b> in <b>one direction</b> -> <b>very high resistance</b> in <b>reverse direction</b> -> <b>non-ohmic</b> . 
6 – Other Circuit Devices	
<b>Thermistor</b>	<b>Temperature dependent resistor</b> -> as temperature <b>increases</b> , resistance <b>decreases</b> -> used in <b>thermostats</b> . 
<b>LDR</b>	<b>Light dependent resistor</b> -> as light intensity <b>increases</b> , resistance <b>decreases</b> -> used in <b>automatic lights</b> . 
7 – Electricity in the Home	
<b>UK mains supply</b>	<b>Alternating P.D.</b> , <b>230 V</b> , frequency = <b>50 Hz</b> . 
<b>Live wire</b>	<b>Brown</b> -> provides <b>alternating P.D.</b> -> at <b>230 V</b> .
<b>Neutral wire</b>	<b>Blue</b> -> <b>completes the circuit</b> -> at <b>0 V</b> .
<b>Earth wire</b>	<b>Green and yellow stripes</b> -> <b>stops appliance becoming live</b> -> only carries <b>current</b> if there is a <b>fault</b> -> at <b>0 V</b> .
8 – The National Grid	
<b>Step-up transformers</b>	Increase the <b>P.D.</b> -> <b>lowers the current</b> -> reduces <b>heating effect</b> -> more <b>efficient transmission</b> .
<b>Step-down transformers</b>	Decrease the <b>P.D.</b> -> <b>safe for domestic use</b> .

**GCSE Science**

**Physics P2 – Electricity**

