

Energy, power, and resistance

Specification reference	Checklist questions	
4.2.1 a	Can you recognise and draw circuit symbols?	<input type="checkbox"/>
4.2.1 b	Can you draw circuit diagrams using circuit symbols?	<input type="checkbox"/>
4.2.2 a	Can you define potential difference (p.d.) and the unit volt?	<input type="checkbox"/>
4.2.2 b	Can you describe the electromotive force (e.m.f.) of a source such as a cell or a power supply?	<input type="checkbox"/>
4.2.2 c	Can you explain the distinction between e.m.f. and p.d. in terms of energy transfer?	<input type="checkbox"/>
4.2.2 d	Can you describe and calculate energy transfer using $W = VQ$ and $W = EQ$?	<input type="checkbox"/>
4.2.2 e	Can you describe and calculate energy transfer using $eV = \frac{1}{2} m v^2$ for electrons and other charged particles?	<input type="checkbox"/>
4.2.3 a	Can you define resistance and the unit ohm?	<input type="checkbox"/>
4.2.3 b	Can you explain Ohm's law?	<input type="checkbox"/>
4.2.3 c i	Can you describe the I – V characteristics of the resistor, filament lamp, thermistor, diode, and light-emitting diode (LED)?	<input type="checkbox"/>
4.2.3 c ii	Can you list and describe techniques and procedures used to investigate the electrical characteristics for a range of ohmic and non-ohmic components?	<input type="checkbox"/>
4.2.3 d	Can you explain the variation of resistance with light intensity for a light-dependent resistor (LDR)?	<input type="checkbox"/>

Specification reference	Checklist questions	
4.2.4 a i	Can you explain the resistivity of a material and use the equation $R = \frac{\rho L}{A}$?	<input type="checkbox"/>
4.2.4 a ii	Can you list and describe techniques and procedures used to determine the resistivity of a metal?	<input type="checkbox"/>
4.2.4 b	Can you explain how resistivity varies with temperature for metals and semiconductors?	<input type="checkbox"/>
4.2.4 c	Can you explain how resistance varies with temperature for a negative temperature coefficient (NTC) thermistor?	<input type="checkbox"/>
4.2.5 a	Can you use the equations $P = VI$, $P = I^2 R$ and $P = \frac{V^2}{R}$?	<input type="checkbox"/>
4.2.5 b	Can you describe energy transfer using the equation $W = VIt$?	<input type="checkbox"/>
4.2.5 c	Can you describe the kilowatt-hour (kW h) as a unit of energy and calculate the cost of energy?	<input type="checkbox"/>