ELECTRICITY

PHYSICS LEVEL 2

Study Checklist

If you've picked up this checklist, congrats! You've begun the first step in a system of resources designed to help you through the Electricity external. To make the most of this, we suggest you sit down, grab a pen, and mark any points that you're feeling a little unsure of. Then, create a subject audit using our template, or refer to the page numbers to find the section in our walkthrough guide to help you out!

STATIC ELECTRICITY

- ☐ I can define the term 'charge' and give its appropriate units [TBC]
- ☐ I understand that electrons have a negative charge (-1.6 x 10^{-19} Coulombs) and protons have a positive charge (+1.6 x 10^{-19} Coulombs). [TBC]
- ☐ I can state the symbols AND units for: electric field strength, voltage, distance, charge, electric potential energy, and force. [TBC]
- ☐ I can describe how an electric field is formed. [TBC]
- ☐ I can draw and label a diagram of a uniform electric field, correctly labelling the plates as either positive or negative, and using lines to represent the electric field lines. [TBC]
- ☐ I can calculate the electric field strength (E), the voltage (V), or the distance between two plates (d) using the equation: E=V/d. [TBC]
- ☐ I can calculate the force on a charge (F), the electric field strength (E), or the charge (q) using the equation: F=Eq. [TBC]
- ☐ I can calculate the electric potential energy (E_p), the electric field strength (E), the charge (q), or the distance between the two plates (d) using the equation: ΔE_p=Eqd. [TBC]
- ☐ I can calculate the kinetic energy (E_k), the mass (m), or the velocity (v) using the equation: E_k=1/2 mv^2 [TBC]
- ☐ I can explain how charged particles – both positive and negative – move through an electric field. [TBC]
- ☐ I can calculate the maximum velocity of a charged particle in an electric field. [TBC]

DC ELECTRICITY

- ☐ I know the electrical symbols for the following electrical components: ammeter, lamp, battery, resistor, switch, voltmeter, cell, and variable resistor [TBC]
- ☐ I can draw a series circuit and a parallel circuit (with components), describing the difference between the two [TBC]
- ☐ I can state the symbols AND units for: voltage, current and resistance [TBC]
- ☐ I can define the terms "voltage", "current" and "resistance" [TBC]
- ☐ I can describe what happens to the current and voltage in a series circuit. [TBC]
- ☐ I can describe what happens to the current and voltage in a parallel circuit. [TBC]
- ☐ I can calculate the voltage (V), current (I), or resistance (R) using the equation: V=I/R [TBC]
- ☐ I can calculate the voltage (V) using the energy and charge [TBC]
- ☐ I can calculate the current (I) using the charge and time [TBC]
- ☐ I can calculate the resistance in a series and parallel circuit [TBC]
- ☐ I can explain why current remains the same across all components in series, but is shared between the branches in a parallel circuit. [TBC]
- ☐ I can explain why the voltage is shared across all components in series, but remains the same in each parallel branch. [TBC]

POWER

- [ ] I can calculate the power of a circuit *[TBC]*
- [ ] I can explain why ammeters must be in series to the component, while voltmeters must be in parallel *[TBC]*
- [ ] I can discuss the brightness of bulbs in a circuit, and explain how the brightness changes in series versus parallel, and when bulbs are added or removed *[TBC]*
- [ ] I can link the brightness of bulbs to the power *[TBC]*

ELECTROMAGNETISM

- [ ] I can state the symbols AND units for: force, magnetic field strength, voltage, current, length, charge, and velocity. *[TBC]*
- [ ] I can explain how magnetic fields are generated *[TBC]*
- [ ] I can draw magnetic field lines going into and coming out of a page *[TBC]*
- [ ] I can draw and label a diagram of a magnet and its magnetic field, indicating the North and South poles, and the direction of the magnetic field lines *[TBC]*
- [ ] I can calculate the force (F), magnetic field strength (B), current (I), or length (L) using the equation: F=BIL *[TBC]*
- [ ] I can calculate the force (F), magnetic field strength (B), charge (q), or velocity (v) using the equation: F=Bqv *[TBC]*
- [ ] I can calculate the voltage (V), magnetic field strength (B), velocity (v), or length (L) using the equation: V=BvL *[TBC]*
- [ ] I can show direction of motion, magnetic field, and current using the “Left Hand Rule”. *[TBC]*
- [ ] I can discuss electromagnetic induction, referring to the movement of charges in a magnet. *[TBC]*
- [ ] I can discuss the motor effect, and can explain how motors, such as a car motor, work *[TBC]*
- [ ] I can discuss how a current and voltage can be generated by moving a conductor through a magnetic field, using real-world examples *[TBC]*