

S2 Physics
ELECTRICITY & MAGNETISM
Study Guide

Electromagnetism

At the end of the section I can :

- ☐ 1 State that a magnetic field exists around a current-carrying wire.
- ☐ 2 Give examples of practical applications of magnets and electromagnets.
- ☐ 3 Describe the parts of a basic electromagnet.
- ☐ 4 State that a current carrying wire experiences a force when the wire is in a magnetic field.
- ☐ 5 Identify on a simple diagram of an electric motor, the **rotating** coil, the **field** coil (magnet), the **brushes** and the **commutator**.
- ☐ 6 State that a voltage may be induced when a coil of wire is moved within a magnetic field.
- ☐ 7 State that the size of an induced voltage depends on; the strength of the magnetic field, the number of coils of wire and the speed of movement.
- ☐ 8 State that the generation of electricity in a power station relies on the movement of conductors in magnetic fields or vice versa.
- ☐ 9 Identify on a simple diagram the major parts of **thermal, nuclear, hydro-electric** and **wind powered** generating stations.
- ☐ 10 Identify the energy change at each of the major stages of a power station.

S2 Physics
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Charge

At the end of the section I can :

- ☐ 1 State that there are two types of electrical charge, positive and negative.
- ☐ 2 Describe how materials can be given an electrical charge by rubbing them.
- ☐ 3 State that like charges repel and opposite charges attract.

S2 Physics
ELECTRICITY & MAGNETISM
Study Guide

Electrical Circuits

At the end of the section I can :

- ☐ 1 Distinguish between conductors and insulators and give examples of each.
- ☐ 2 State that electric current is the movement of negative charges, called electrons.
- ☐ 3 State that the voltage of a supply is a measure of the energy given to the charge in a circuit.
- ☐ 4 Draw and identify the circuit symbols for a battery, lamp, switch and resistor.
- ☐ 5 State that voltage is measured by a voltmeter and the unit of voltage is the volt.
- ☐ 6 State that current is measured by an ammeter and the unit of current is the ampere.
- ☐ 7 Draw and identify the circuit symbols for an ammeter and voltmeter.
- ☐ 8 Draw circuit diagrams to show how to position ammeters and voltmeters correctly in circuits.
- ☐ 9 State that increasing the resistance of a circuit causes the current in the circuit to decrease.
- ☐ 10 State that resistance is measured with an ohmmeter and the unit of resistance is the ohm.
- ☐ 11 Draw and identify the circuit symbol for an ohmmeter.
- ☐ 12 Give two uses of variable resistors.
- ☐ 13 Describe a series circuit.
- ☐ 14 State that in a series circuit the current is the same at all positions.

S2 Physics
ELECTRICITY & MAGNETISM
Study Guide

- ☐ 15 State that the sum of the voltages across the components in series is equal to the voltage of the supply.
- ☐ 16 Describe a parallel circuit.
- ☐ 17 State that the sum of currents in two parallel branches is equal to the current drawn from the supply.
- ☐ 18 State that the voltages across components in parallel is the same for each component.

S2 Physics
ELECTRICITY & MAGNETISM
Study Guide

Household Electricity

At the end of the section I can :

- ☐ 1 State that the mains voltage is 230 volts.
- ☐ 2 Identify the live, neutral and earth wire from the colour of their insulation.
- ☐ 3 State where each pin wire must be connected for a plug.
- ☐ 4 State that the earth wire is a safety device.
- ☐ 5 State that fuses in a plug are intended to protect flexes.
- ☐ 6 Draw and identify the circuit symbol for a fuse.
- ☐ 7 State that circuit breakers can be used instead of mains fuses.
- ☐ 8 State the advantages of using circuit breakers instead of mains fuses.
- ☐ 9 State that the human body conducts electricity and that moisture increases its ability to conduct.

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