

# AQA Chapter 4 Checklist 2017 (Triple)

| Can you...?                                                                                                                                                                                     |  |  |  |
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| <b>Chapter 4: Electric circuits.</b>                                                                                                                                                            |                                                                                     |                                                                                     |                                                                                     |
| Describe how electric circuits are shown as diagrams.                                                                                                                                           |                                                                                     |                                                                                     |                                                                                     |
| Write down the difference between a battery and a cell.                                                                                                                                         |                                                                                     |                                                                                     |                                                                                     |
| Describe what determines the size of an electric current.                                                                                                                                       |                                                                                     |                                                                                     |                                                                                     |
| Calculate the size of an electric current from the charge flow and the time taken.                                                                                                              |                                                                                     |                                                                                     |                                                                                     |
| Write down what is meant by potential difference.                                                                                                                                               |                                                                                     |                                                                                     |                                                                                     |
| Write down what resistance is and what its unit is.                                                                                                                                             |                                                                                     |                                                                                     |                                                                                     |
| Write down Ohm's law.                                                                                                                                                                           |                                                                                     |                                                                                     |                                                                                     |
| Describe what happens when you reverse the potential difference across a resistor.                                                                                                              |                                                                                     |                                                                                     |                                                                                     |
| Describe what happens to the resistance of a filament lamp as its temperature increases.                                                                                                        |                                                                                     |                                                                                     |                                                                                     |
| Describe how the current through a diode depends on the potential difference across it.                                                                                                         |                                                                                     |                                                                                     |                                                                                     |
| Describe what happens to the resistance of a temperature-dependent resistor as its temperature increases.                                                                                       |                                                                                     |                                                                                     |                                                                                     |
| Describe what happens to the resistance of a light-dependent resistor as the light level increases.                                                                                             |                                                                                     |                                                                                     |                                                                                     |
| Describe the current, potential difference, and resistance for each component in a series circuit.                                                                                              |                                                                                     |                                                                                     |                                                                                     |
| Describe the potential difference of several cells in series.                                                                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Calculate the total resistance of two resistors in series.                                                                                                                                      |                                                                                     |                                                                                     |                                                                                     |
| Explain why adding resistors in series increases the total resistance.                                                                                                                          |                                                                                     |                                                                                     |                                                                                     |
| Describe the currents and potential differences for components in a parallel circuit.                                                                                                           |                                                                                     |                                                                                     |                                                                                     |
| Calculate the current through a resistor in a parallel circuit.                                                                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Explain why the total resistance of two resistors in parallel is less than the resistance of the smaller individual resistor.                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Explain why adding resistors in parallel decreases the total resistance.                                                                                                                        |                                                                                     |                                                                                     |                                                                                     |
| <b>Chapter 4: Equations I need to know.</b>                                                                                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| $\begin{array}{l} \text{charge flow (Q)} = \text{current (I)} \times \text{time taken (t)} \\ \text{(coulombs, C)} \quad \quad \text{(amperes, A)} \quad \quad \text{(seconds, s)} \end{array}$ |                                                                                     |                                                                                     |                                                                                     |
| $\begin{array}{l} \text{potential difference} = \frac{\text{energy transferred (E) (joules, J)}}{\text{charge (Q) (coulombs, C)}} \\ \text{across a component (V)} \end{array}$                 |                                                                                     |                                                                                     |                                                                                     |
| $\begin{array}{l} \text{resistance (R)} = \frac{\text{potential difference (V) (volts, V)}}{\text{current (I) (coulombs, C)}} \\ \text{(ohms, } \Omega \text{)} \end{array}$                    |                                                                                     |                                                                                     |                                                                                     |

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| <b>Chapter 4: Equations I am given and need to use.</b>                                                                                                                                              |  |  |  |
| None!                                                                                                                                                                                                |  |  |  |
| <b>Chapter 4: Key words I need to know</b>                                                                                                                                                           |  |  |  |
| <b>Ammeter:</b> <i>an instrument for measuring the size of a current. It is put into a circuit in series with other components.</i>                                                                  |  |  |  |
| <b>Ampere (amps, A):</b> <i>the unit of electric current. One ampere is a flow of 1 coulomb of charge per second.</i>                                                                                |  |  |  |
| <b>Battery:</b> <i>a number of electrical cells in series.</i>                                                                                                                                       |  |  |  |
| <b>Charge:</b> <i>a conserved property of some particles (e.g. electron, proton) which causes them to exert a force on each other.</i>                                                               |  |  |  |
| <b>Component:</b> <i>a part of something e.g. a lamp might be a component of an electric circuit.</i>                                                                                                |  |  |  |
| <b>Diode:</b> <i>a non-ohmic conductor that has a much higher resistance in one direction (its reverse direction) than in the other direction (its forward direction).</i>                           |  |  |  |
| <b>Discharge:</b> <i>to remove an electric charge by conduction.</i>                                                                                                                                 |  |  |  |
| <b>Earthed:</b> <i>connected to earth so that any electrostatic charges can flow away.</i>                                                                                                           |  |  |  |
| <b>Electric field:</b> <i>a charged object (X) creates an electric field around itself, which causes a non-contact force on any other charged object in the field.</i>                               |  |  |  |
| <b>Electrons:</b> <i>tiny negatively charged particles that move around the nucleus of an atom.</i>                                                                                                  |  |  |  |
| <b>Induce:</b> <i>to create. For example, a wire in a changing magnetic field has a current in it.</i>                                                                                               |  |  |  |
| <b>Ion:</b> <i>a charged atom.</i>                                                                                                                                                                   |  |  |  |
| <b>Light-dependent resistor (LDR):</b> <i>a resistor whose resistance depends on the intensity of the light incident on it.</i>                                                                      |  |  |  |
| <b>Light-emitting diode (LED):</b> <i>a diode that emits light when it conducts.</i>                                                                                                                 |  |  |  |
| <b>Neutrons:</b> <i>uncharged particles of the same mass as protons. The nucleus of an atom consists of protons and neutrons.</i>                                                                    |  |  |  |
| <b>ohm (<math>\Omega</math>):</b> <i>the unit for measuring electrical resistance.</i>                                                                                                               |  |  |  |
| <b>Parallel:</b> <i>components connected in a circuit so that the potential difference is the same across each one.</i>                                                                              |  |  |  |
| <b>Potential difference:</b> <i>a measure of the work done or energy transferred to the lamp by each coulomb of charge that passes through it. The unit of potential difference is the volt (V).</i> |  |  |  |
| <b>Protons:</b> <i>positively charged particles with an equal and opposite charge to that of an electron.</i>                                                                                        |  |  |  |

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| <b>Resistance:</b> <i>a way of saying how difficult it is for electricity to flow through something.</i>                              |  |  |  |
| <b>Series:</b> <i>components connected in a circuit in such a way that the same current passes through them.</i>                      |  |  |  |
| <b>Static electricity:</b> <i>unbalanced electric charges on the surface or within a material.</i>                                    |  |  |  |
| <b>Thermistor:</b> <i>a resistor whose resistance depends on the temperature of the thermistor.</i>                                   |  |  |  |
| <b>volt, V:</b> <i>the unit for measuring potential difference (voltage).</i>                                                         |  |  |  |
| <b>Voltmeter:</b> <i>an instrument for measuring the potential difference across a component. Connected in parallel to a circuit.</i> |  |  |  |