**Physics Topic 2: Electricity**

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| **Definitions** | **Equations** |
| 1 | Current | The rate of flow of electric charge (how many electrons are moving through a circuit every second) | 1 | *Charge flow = current x time* | ***Q = I t*** |
| 2 | *Potential difference = current x resistance* | ***V = I R*** |
| 3 | *Power = potential difference x current* | ***P = V I*** |
| 2 | Potential difference (AKA voltage) | The energy carried by the electrons in the circuit **OR** The difference between the energy carried by the electrons at 2 points in the circuit. | 4 | *Power = (current)2 x resistance* | ***P = I2 R*** |
| 5 | *Energy transferred = power x time* | ***E = P t*** |
| 6 | *Energy transferred = charge flow x potential difference* | ***E = Q V*** |
| **Diagrams** |
| 3 | Resistance | The ability of a component to resist the flow of electricity. | **Current – PD graph for a fixed resistor**Resistance constant at all PDsThis component is an ohmic conductor | **Current – PD graph for a bulb**Resistance increases at high PD because of high temperature |
| 4 | Direct current | Current that always flows in the same direction |
| 5 | Alternating current | Current that repeatedly changes direction back and forth |
| 6 | Thermistor | Has high resistance when temperature is low |
| 7 | LDR | Has high resistance when light levels are low |
| Transmitting and Using Electricity |
| Step Up TransformerPC8_gfx_transformer_stepup* More turns on secondary coil than on primary, therefore increases voltage.
* Increasing voltage with a step up transformer decreases the current in the wires.
* Lower current in wires means less resistance.
* Less resistance means less energy lost as heat.
* Therefore it is more efficient to transmit electricity at high voltage.
 | Step Down TransformerPC8_gfx_transformer_stepdown* Fewer turns on secondary coil than on primary, therefore decreases voltage.
* Reducing the voltage makes it safer to use in the home.
 | **Parallel Circuit*** The potential difference across each component is the same
* The total current through the whole circuit is the sum of the currents through the separate components
* The total resistance of two resistors is less than the resistance of the smallest individual resistor.
 | **Circuit symbols (just the harder ones)** |
| http://www.frankswebspace.org.uk/ScienceAndMaths/physics/physicsGCSE/bytesize%20images/wiringPlugs1.gifLive wire carries the currentNeutral completes the circuitEarth prevents electric shocks | **Series Circuit*** There is the same current through each component
* The total potential difference of the power supply is shared between the components
* The total resistance of two components is the sum of the resistance of each component.
 |  **Current – PD graph for a diode**Resistance very high in one direction.Current only flows in one direction |