

### Symbols To Know

|                            |                                |
|----------------------------|--------------------------------|
| Switch                     | Thermistor                     |
| Fuse                       | Light Dependent Resistor (LDR) |
| Lamp                       | Variable Resistor/Reostat      |
| Light Emitting Diode (LED) | Diode                          |
| Resistor                   | Voltmeter                      |
| Battery                    | Ammeter                        |
| A.C Power Supply           | D.C Power supply               |
| Battery Pack               | Speaker                        |

### Series and Parallel Circuits

| Series                                               | Parallel                                                              |
|------------------------------------------------------|-----------------------------------------------------------------------|
| Current flowing in each component is the same        | Current is shared at each junction                                    |
| Useful when you need a warning when something breaks | Useful when you want other components to work when another is broken. |
|                                                      | All components receive the same voltage                               |

### I-V Graphs

### Current And Voltage

| Voltage                                                       | Current                                                   |
|---------------------------------------------------------------|-----------------------------------------------------------|
| PUSH behind current                                           | Rate of flow of electrons                                 |
| Measured in Volts (V)                                         | Measured in Amps (A)                                      |
| Measured by voltmeter, which is placed in parallel to circuit | Measured by ammeter, which is placed in series to circuit |
| The more batteries, the more voltage                          | The more resistance, the less current                     |

NOTE: Only ENERGY is used up

### Resistor

Resistors are the opposition to flow of current.

### Resistors continued

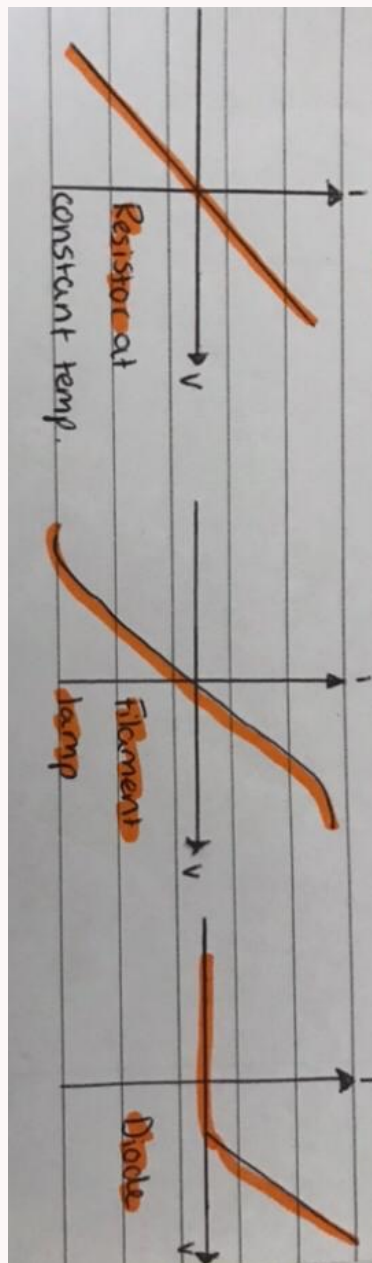
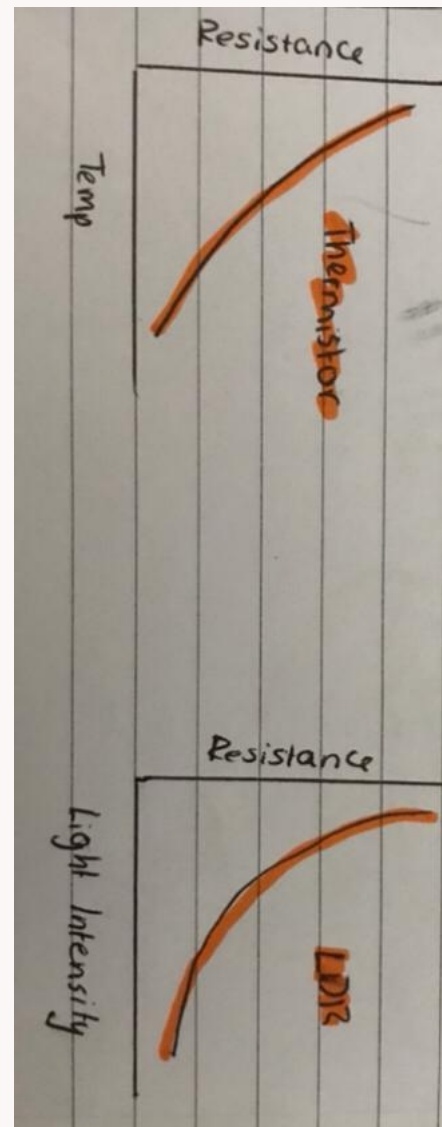
It is measured in Ohms' and is calculated by Ohm's Law

NOTE: A filament lamp is also a resistor

### Equations

|                                           |                               |
|-------------------------------------------|-------------------------------|
| Voltage = Current x Resistance            | $V=IR$                        |
| Power = Current x Voltage                 | $P=IV$                        |
| Power = Current <sup>2</sup> x Resistance | $P=I^2R$                      |
| Total Resistance in Series                | $R^1 + R^2 + R^3 \dots$       |
| Total Resistance in Parallel              | $1/R^1 + 1/R^2 + 1/R^3 \dots$ |

### Thermistors and LDR Graph



The graphs can also be reversed (V-I Graphs)



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 Page 1 of 3.

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### Other things

Thin wire - Less current

Thick wire - More current

Long Wire - Less current

Short Wire - More current

Mains voltage is usually 230V

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Page 2 of 3.

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