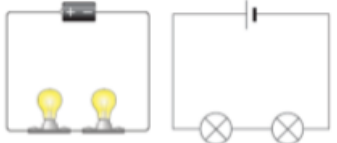
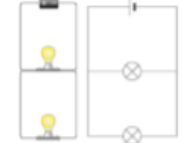


# Knowledge Organiser – Year 8 Electricity


## Key words

<b>Electrical Conductor</b>	Will allow electricity to flow through it
<b>Electrical insulator</b>	Will not allow electricity to flow through it
<b>Battery</b>	Two or more cells joined together
<b>Cell</b>	Device used to generate electricity usually by transforming chemical energy into electrical
<b>Electrical component</b>	Part of an electrical circuit e.g. bulb or battery
<b>Ammeter</b>	Device used to measure the current in the circuit
<b>Voltmeter</b>	Device used to measure the potential difference (voltage) in a circuit
<b>Volt</b>	The unit voltage is measured in
<b>Amp</b>	The unit current is measured in
<b>Ohm</b>	The unit resistance is measured in
<b>In series</b>	Components that are connected one after another on the same loop of the circuit are connected in series
<b>In parallel</b>	Components that are connected on separate loops are connected in parallel
<b>Current</b>	a flow of electric charged particles called electrons
<b>Potential Difference (Voltage)</b>	the difference in electrical energy between two points of a circuit
<b>Resistance</b>	When something tries to stop the flow of electrons around a circuit

## Series and parallel

	Series	Parallel
Description	Components are connected one after another on the same loop	Components are connected on separate loops
Diagram		
Voltage	The voltage is shared between components	Every component has the same value
Current	Every component has the same value	The current is shared between each loop
Advantages	<ul style="list-style-type: none"> <li>• Easy to use</li> <li>• Easy to add more power to the circuit</li> <li>• Doesn't over heat easily</li> <li>• Components all have same current</li> </ul>	<ul style="list-style-type: none"> <li>• Every unit gets an equal amount of voltage</li> <li>• Easy to connect and disconnect components</li> <li>• If a fault occurs on one loop it won't affect other loops</li> <li>• Easy to switch different components on and off using the same circuit</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>• If one component breaks the whole circuit won't work</li> <li>• Increasing number of components increases resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Lots of wires</li> <li>• Cannot increase voltage</li> <li>• Complexity of resistance in different branches</li> <li>• Varying current in the branches</li> </ul>

## V = IR

Description	How hard it is for the current to flow in a circuit
Units	Ohms ( $\Omega$ )
Equation	Resistance = Voltage/Current
Triangle	
Example	<p>The voltage in a bulb is 1.5V. The current flowing through the bulb is 0.75 A. What is the resistance?</p> <p>Resistance = Voltage/Current Resistance = 1.5/0.75 Resistance = 2<math>\Omega</math></p>

## Series and Parallel


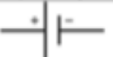







	Current	Potential difference	Resistance
Description	Flow of charge	The difference in electrical energy between two parts of a circuit	How hard it is for the current to flow in a circuit
Symbol	I	V	R
How to measure it	Ammeter (in series)	Voltmeter (in parallel)	This can't be measured directly. However it can be worked out through measuring current and potential difference and using $R=V/I$
units	Amps (A)	Volts (V)	Ohms ( $\Omega$ )

## Safety

- Turn off the power if you're making or changing your circuits
- Set the voltage to the lowest level that will allow your circuit to work
- Don't use any components with exposed wires
- Keep electrical components away from water
- Don't get any metal objects (jewellery) away from circuits
- The voltage in your homes is lower than that in overhead cables to protect you
- The voltage in your home is 230V
- This hazard symbol is used to warn of high voltage. You should not touch anything with this symbol on.



## Symbols

Component	Symbol
battery	
Cell	
Bulb	
Switch (open)	
Switch (closed)	
Ammeter	
Voltmeter	
Motor	
Buzzer	
Resistor	