Your notes

KS3 Science: revision notes

P1.4 Electrical circuits

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Circuits

- **Current** only flows around a complete **circuit**. An open **switch** breaks the circuit.
- Components include **cells**, batteries (two or more **cells**), **switches**, bulbs (lamps), resistors, buzzers, motors, ammeters, voltmeters and LEDs. Each has a circuit symbol.
- Models help explain **circuits**: in the rope model, the **cell** is the person pulling the rope round, and the rope is the charge that moves everywhere at once. Charge isn't used up; energy is transferred.

Current

- **Current** is the flow of electric charge. It is measured in amps (A) with an **ammeter** connected in series.
- In a **series circuit**, the **current** is the same everywhere.
- In a **parallel circuit**, the **current** splits at a junction, and the **currents** in the branches add up to the total current.

Potential difference

- **Potential difference** (voltage) is the "push" from the **cell**. It is measured in volts (V) with a **voltmeter** connected in parallel, across a component.
- In a **series circuit**, the voltages across the components add up to the voltage of the supply.
- In a **parallel circuit**, each branch gets the full voltage of the supply.

Series and parallel circuits

- Series: one loop. If one bulb breaks, they all go out. Adding more bulbs makes each one dimmer.

- Parallel: several branches. If one bulb breaks, the others stay on, and each bulb is as bright as a single bulb would be. Homes are wired in parallel so that each light can be switched on and off separately.
- Conductors, such as copper, let **current** flow easily. Insulators, such as plastic and rubber, don't.
- When drawing conclusions, describe the pattern in the results, quote data, and explain it using science.

Your notes

Key terms

Circuit	A complete loop that current can flow around.
Current	The flow of electric charge, measured in amps (A).
Ammeter	Measures current; connected in series.
Potential difference	The push that makes current flow, measured in volts (V).
Voltmeter	Measures potential difference; connected in parallel.
Series circuit	A circuit with all the components in one loop.
Parallel circuit	A circuit with more than one branch.
Cell	A single source of electrical energy.
Battery	Two or more cells joined together.
Switch	A component that opens or closes a circuit.
Electrical conductor	A material that lets current flow easily.
Electrical insulator	A material that doesn't let current flow easily.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is needed for a current to flow?
2. What is the unit of current?
3. How is an ammeter connected in a circuit?
4. How is a voltmeter connected in a circuit?
5. In a series circuit, the current next to the cell is 0.2 A. What is the current between the two bulbs?
6. In a parallel circuit, one branch has 0.3 A and the other has 0.5 A. What is the total current?
7. What happens in a series circuit if one bulb breaks?
8. Why are the lights in a house wired in parallel?

Answers

1. A complete circuit
2. The amp (A)
3. In series with the component

4. In parallel across the component
5. 0.2 A
6. 0.8 A
7. All the bulbs go out
8. Each light can be switched separately, and one failing doesn't turn off the others

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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