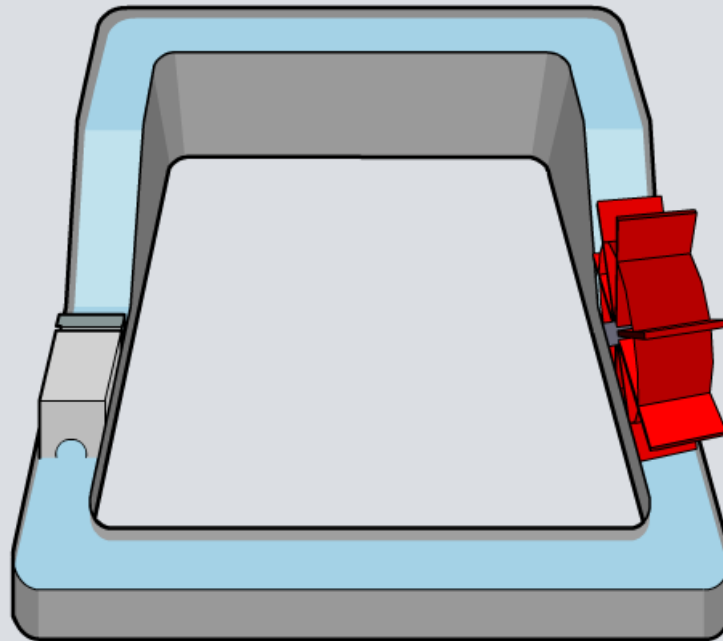


Current and Potential Difference



What is current?

Current is a measure of the rate of flow of electric charge in a circuit. Electric charge is measured in **coulombs**.

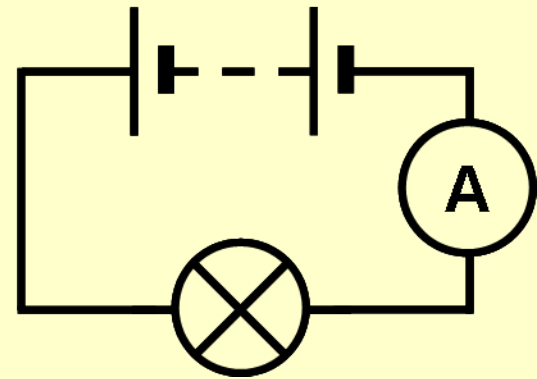
How is current measured?

Current is measured in **amperes (A)** using an **ammeter**.

This unit is named after Andre Ampere, one of the early scientists to study electricity.

A current of 1 A is 1 coulomb of charge flowing every second.

So, a current of 5 A is 5 coulombs of charge flowing every second.



An ammeter must be connected in series because it measures the current flowing through it.

What is potential difference?

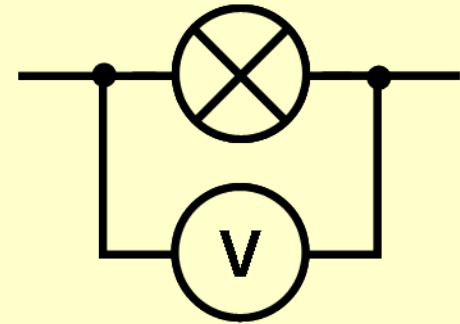
Potential difference is a measure of the difference in electrical potential energy between two points in a circuit. Potential difference is also called **voltage**.

Voltage is measured in **volts (V)** using a **voltmeter**.

The voltage of a battery or cell is a measure of the force or “push” it gives the current.

A 1 V cell gives 1 joule (J) of energy to each coulomb of charge.

So, a 12 V battery gives 12 J of energy to each coulomb of charge.



A voltmeter must be connected in parallel because it measures the potential difference across the component.

Water model of a circuit



Are they cells or batteries?

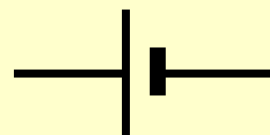
A cell is a useful source of electricity.

A chemical reaction takes place inside the cell, which produces a potential difference (voltage) across the cell.



In everyday language, people often refer to cells as batteries. However, there is a difference between a cell and a battery and it is important to use the terms correctly!

**Circuit symbol
for a cell**



What is a battery?

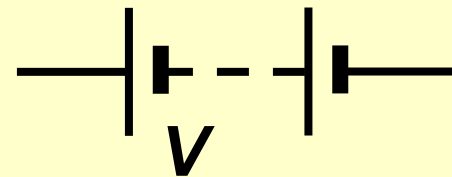
A battery consists of two or more cells that are joined together.

The potential difference across a battery is the sum of the potential differences across the cells.

A 12 V car battery contains six 2 V cells inside its case.



Circuit symbol
for a **battery**



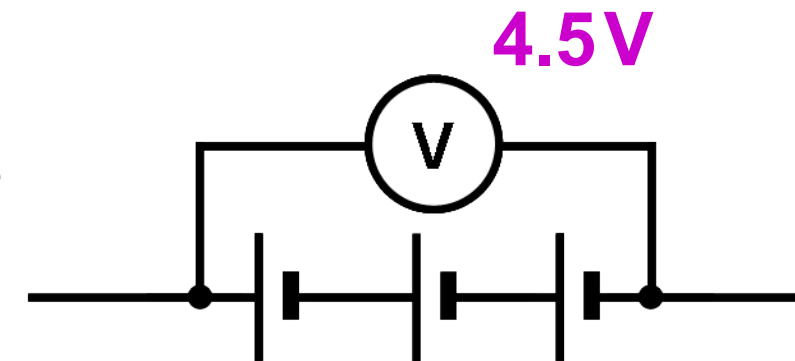
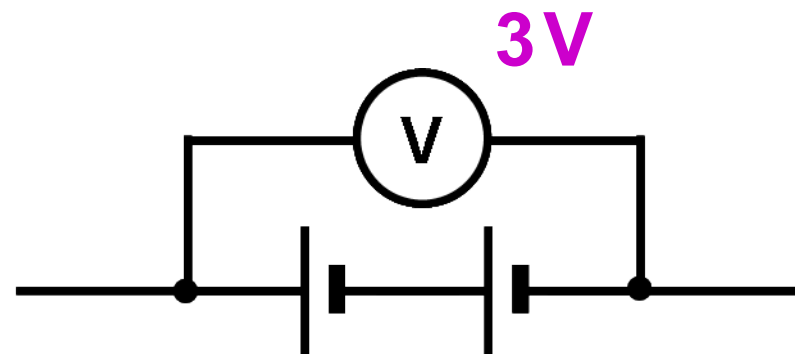
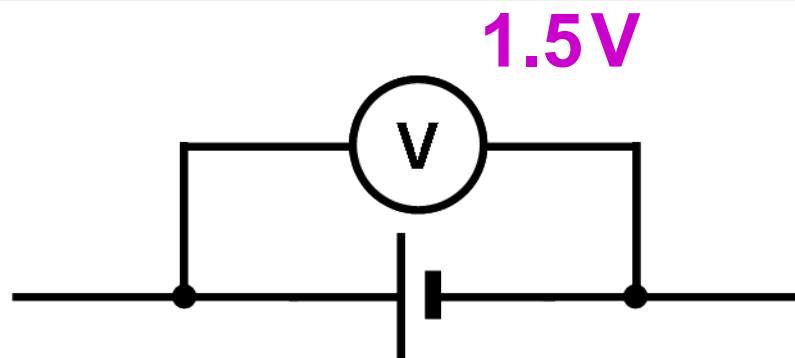
How can battery voltage be increased?

Using more cells in a battery increases the voltage.

If two or more cells are connected in series, the total voltage across the battery can be found by adding up the cell voltages.

So, if 2 cells with a voltage of 1.5 V are connected together, the voltage across the battery is 3 V.

When three cells of 1.5 V are connected, what is the voltage across the battery?



Current and voltage – true or false?

Are these statements about current and voltage true or false?

1.	Current is the rate of flow of electric charge.	
2.	Current is measured in volts.	
3.	Potential difference is the difference in electrical potential energy between two points.	
4.	Potential difference is also called voltage.	
5.	Potential difference is measured in amps.	
6.	Cells and batteries are used to make electrons.	

true

false



solve

