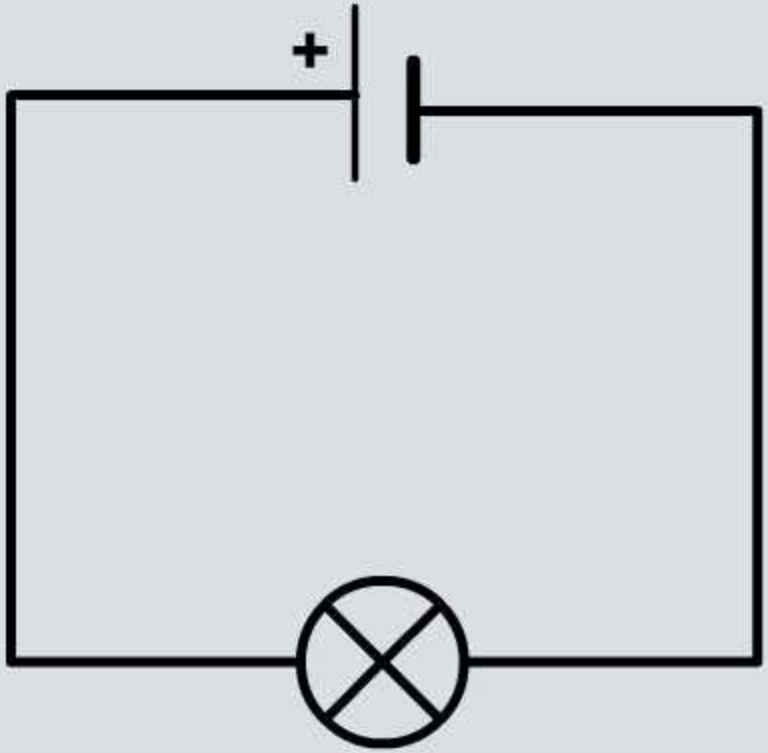
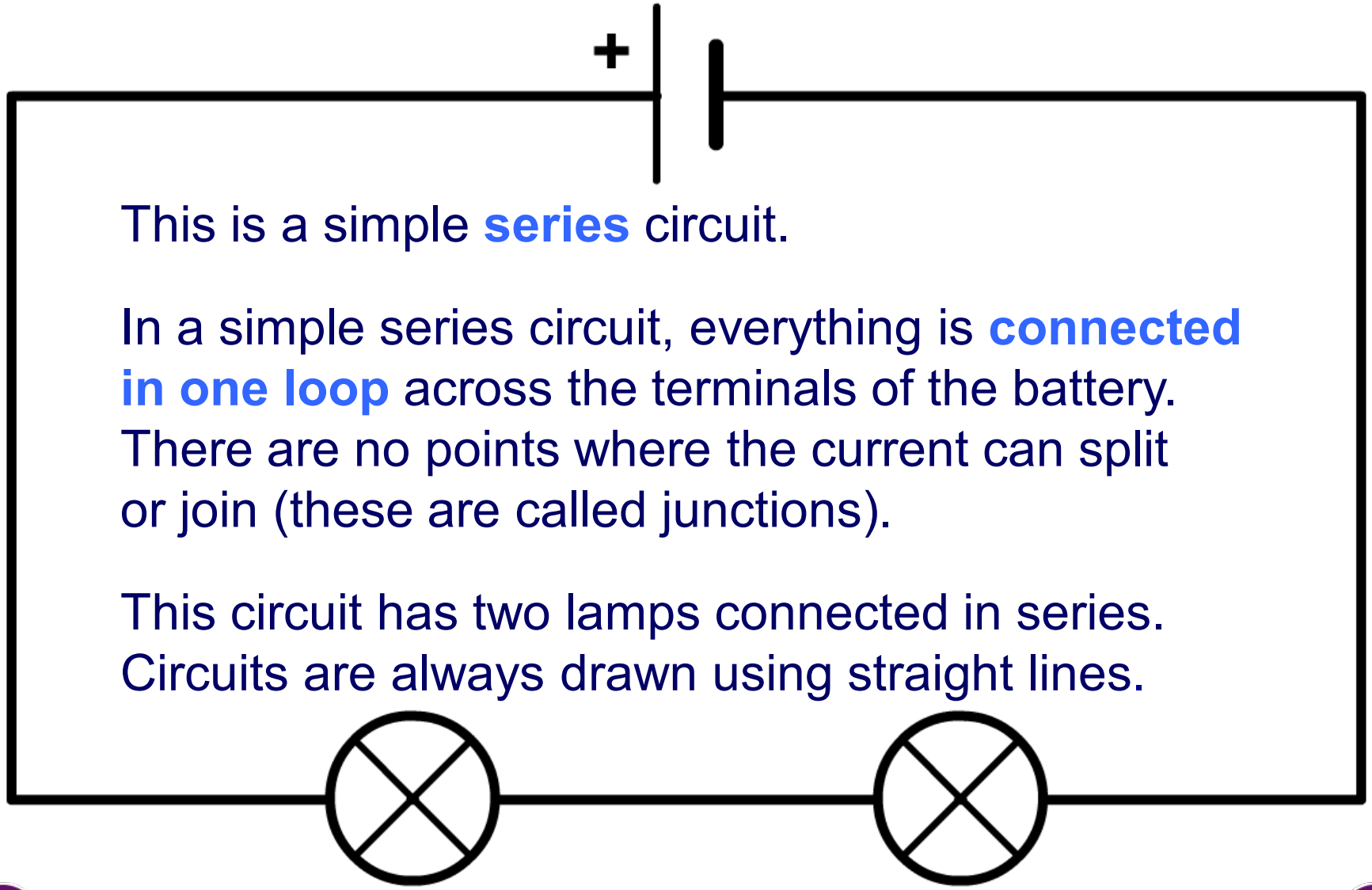
Series Circuits



What is a series circuit?



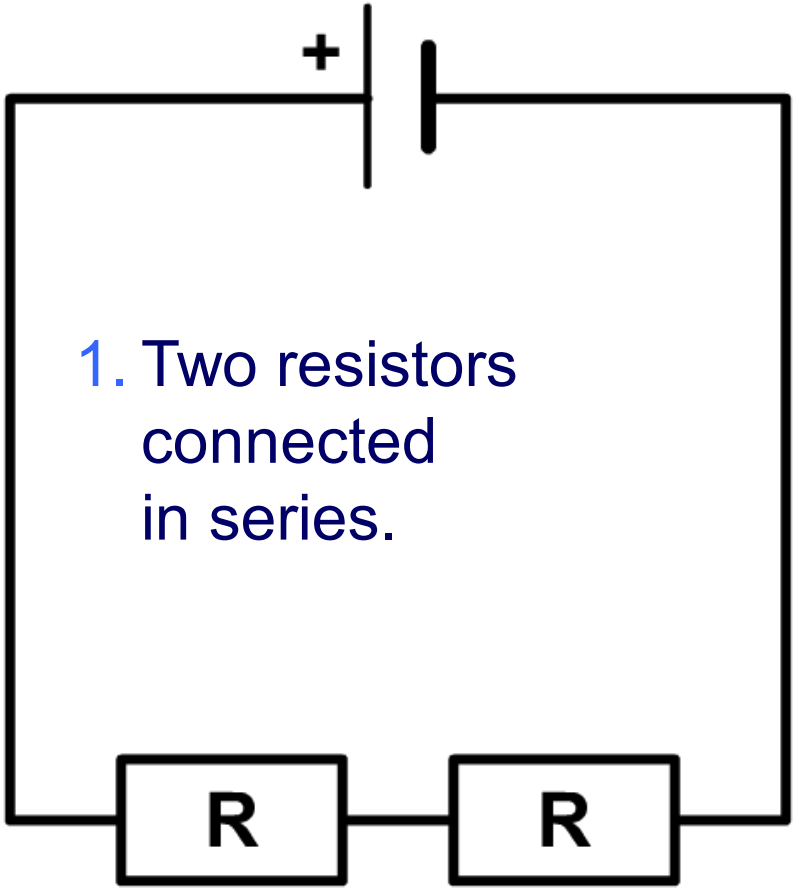
This is a simple **series** circuit.

In a simple series circuit, everything is **connected in one loop** across the terminals of the battery. There are no points where the current can split or join (these are called junctions).

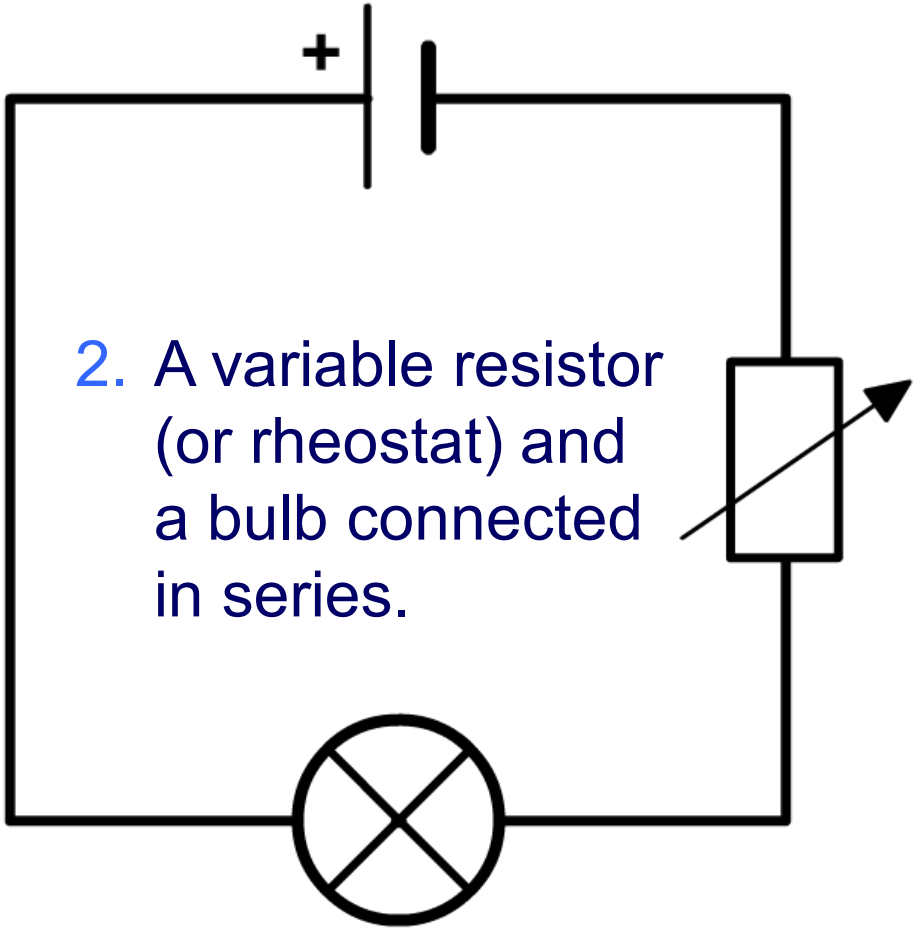
This circuit has two lamps connected in series. Circuits are always drawn using straight lines.

Examples of series circuits

Here are some other simple series circuits:



1. Two resistors connected in series.



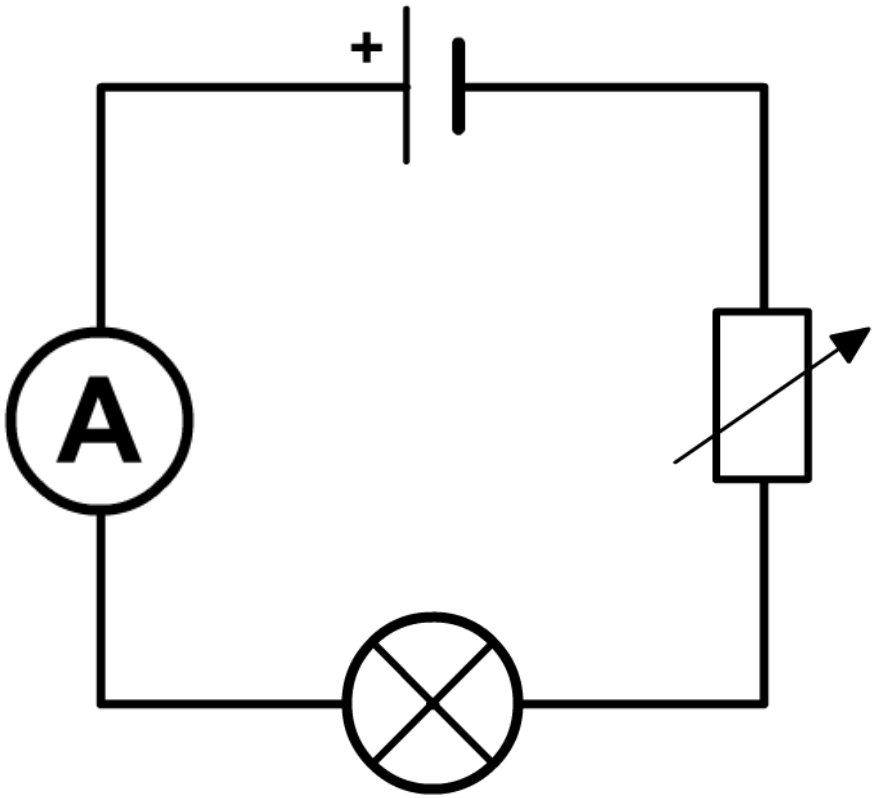
2. A variable resistor (or rheostat) and a bulb connected in series.

Measuring current

The unit of measurement for **current** is the **amp**, which has the symbol A.

Current is measured using a device called an **ammeter**.

In a circuit diagram, an ammeter is shown by an ‘A’ in a circle.



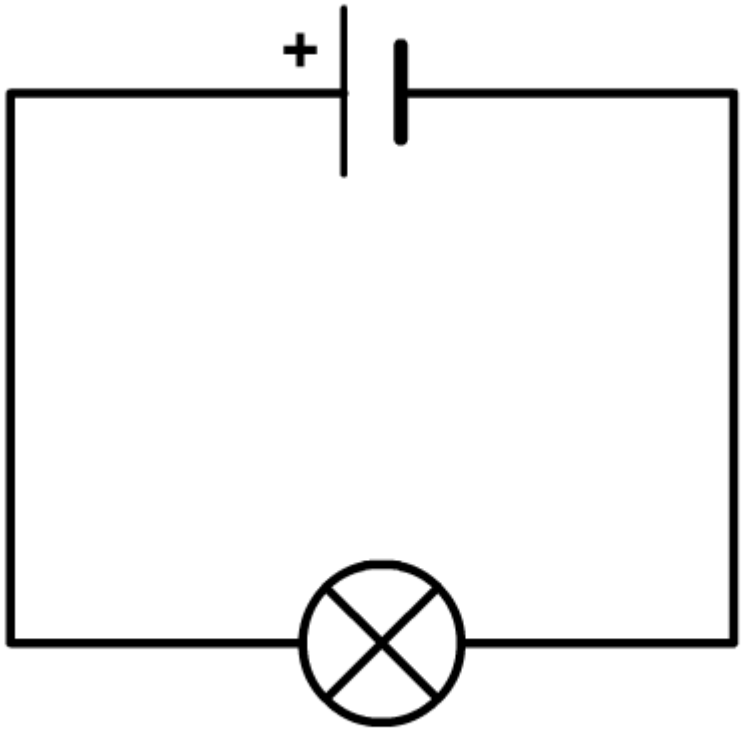
When measuring the current through a component, the ammeter is always connected in **series** (in the same loop) with that component.

Experiment 1: current in a series circuit

How can we investigate current in a series circuit?

How can we investigate how components in a series circuit affect the current?

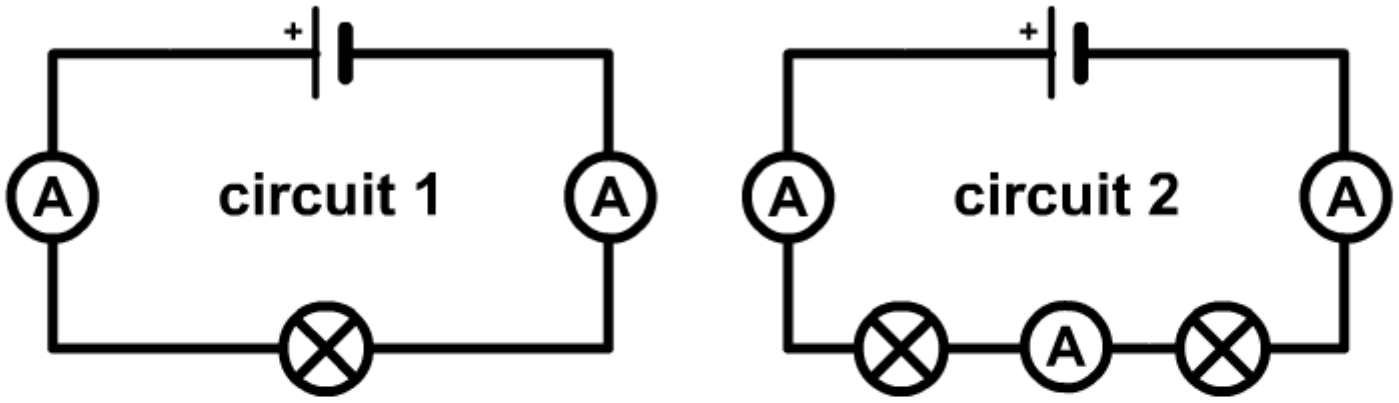
Click "**start**" to find out.



start

Current in a series circuit: summary

What are the missing words about series circuits?



Circuit 1:

1a. The current at different positions in the circuit, before and after the bulb, was [?].

1b. Therefore current [?] used up by the components in the circuit.

solve

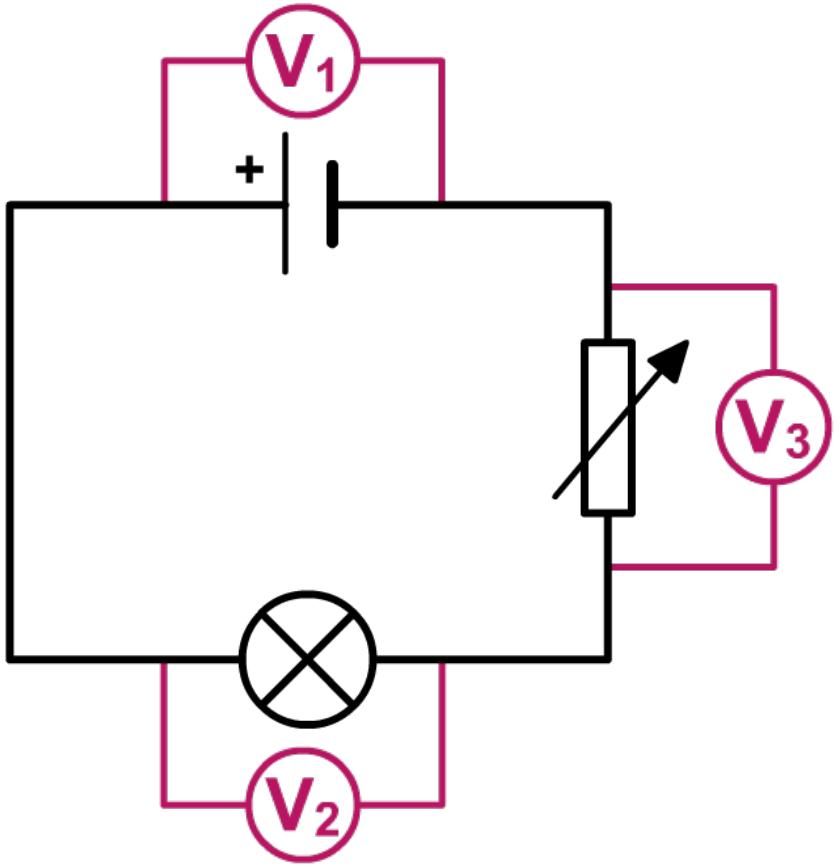
Measuring voltage

Voltage is measured using a device called a voltmeter. In a circuit diagram, a voltmeter is given the symbol V.

When measuring the voltage across a component, the voltmeter is always connected in **parallel** with (or across) the component.

This is still a series circuit, as the voltmeter does not affect the circuit.

The voltage supplied by the battery is **shared** between all the components in a series circuit.

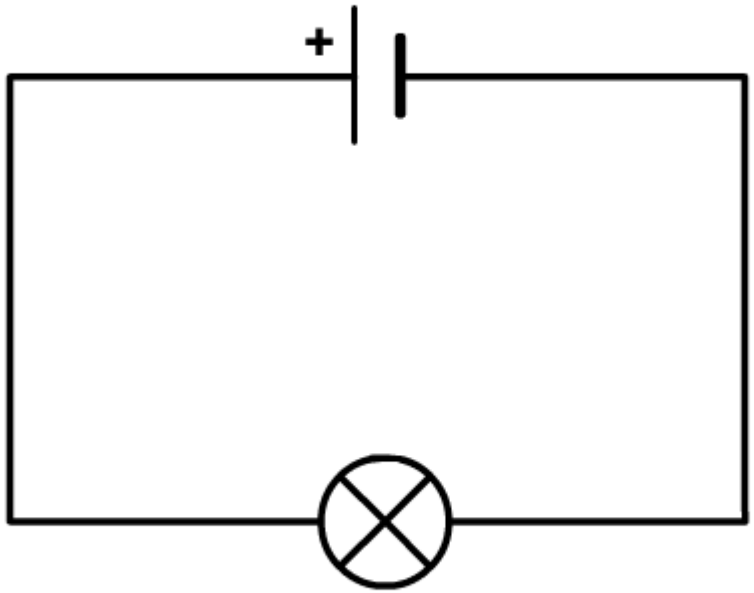


Experiment 2: voltage in a series circuit

How can we investigate voltage in a series circuit?

How can we investigate how components in a series circuit affect the voltage?

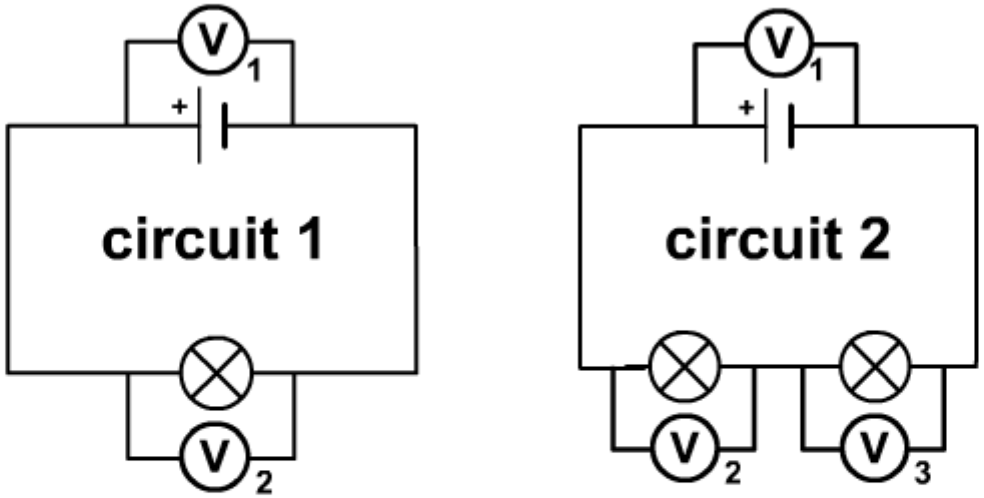
Click "**start**" to find out.



start

Voltage in a series circuit: summary

What are the missing words about voltage in series circuits?



1a. The current is the ? of electricity around the circuit.

1b. The ? is the amount of push.

solve

Current or voltage?

Does each statement apply to current or voltage?

current	voltage

measured using a voltmeter

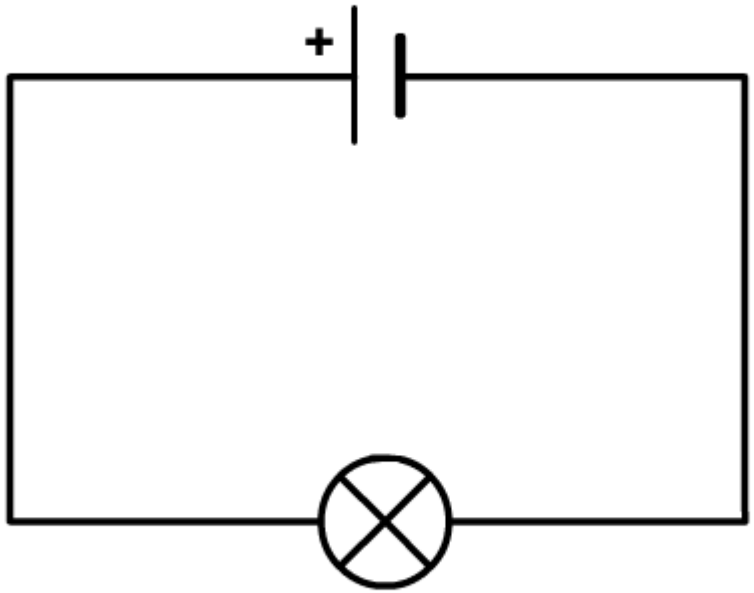
solve

Experiment 3: cells in a series circuit

How can we investigate cells in a series circuit?

How can we investigate how changing the number of cells affects a series circuit?

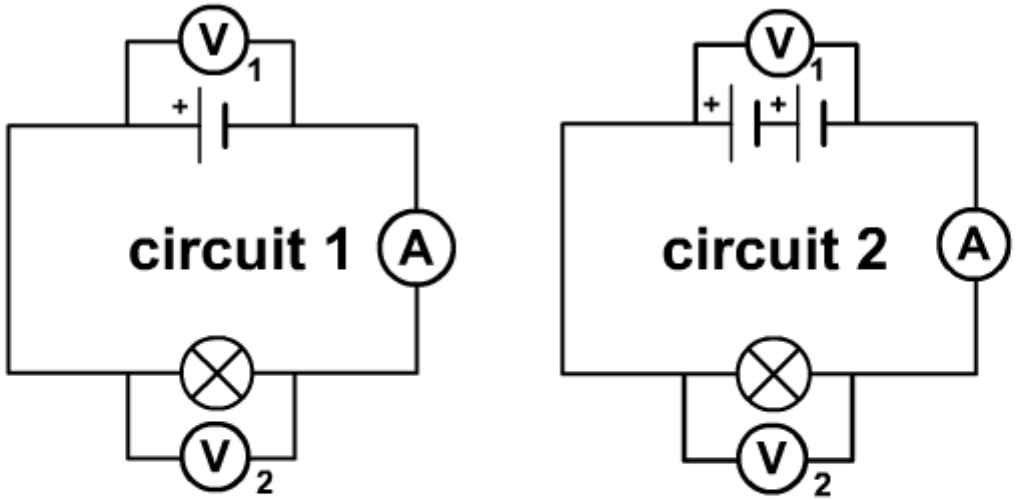
Click "**start**" to find out.



start

Cells in a series circuit: summary

What are the missing words about cells in series circuits?



1a. Increasing the number of cells [?] the current that flows in the circuit.

1b. The [?] flowing in the circuit depends on the [?] of the power supply.

solve

Series circuits – key ideas

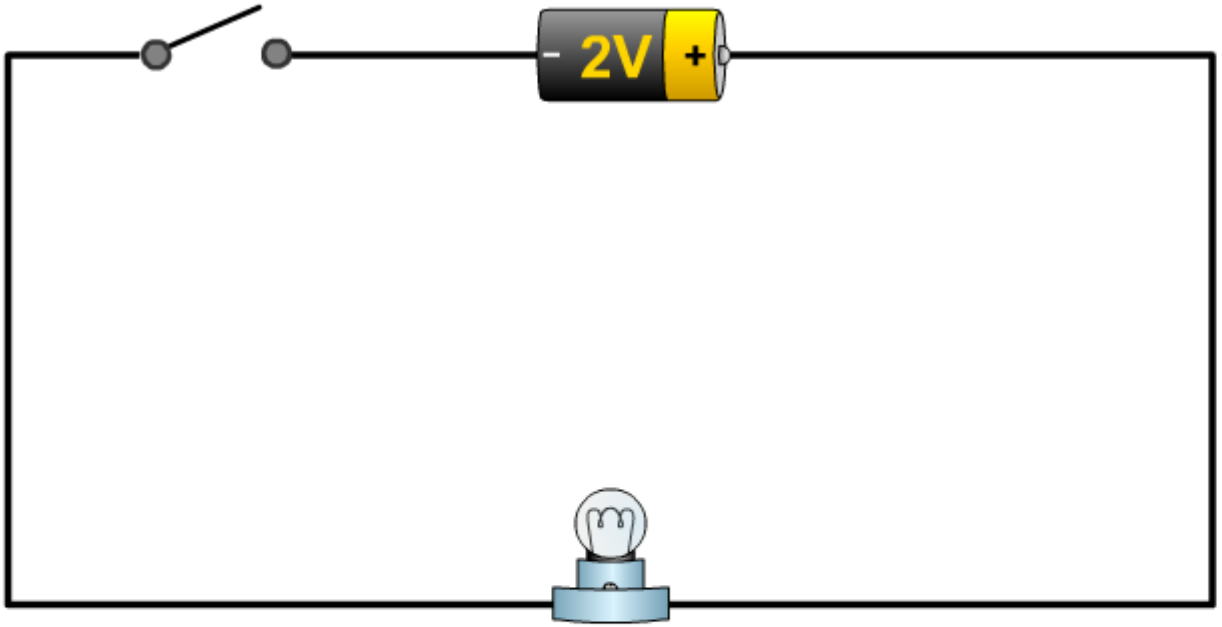
1. In a **series circuit** the current is the **same** in all parts of the circuit. Series circuits are found in flashlights and strings of Christmas lights.

2. The supply voltage is **shared** between the components in a series circuit. (The sum of the voltage across each component is the same as the total supply voltage.)

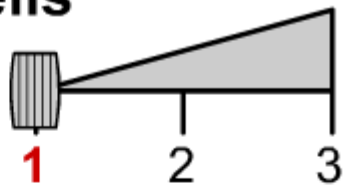
3. The current depends on the voltage in any circuit.

Make your own series circuit

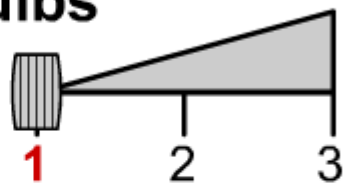
Investigating series circuits

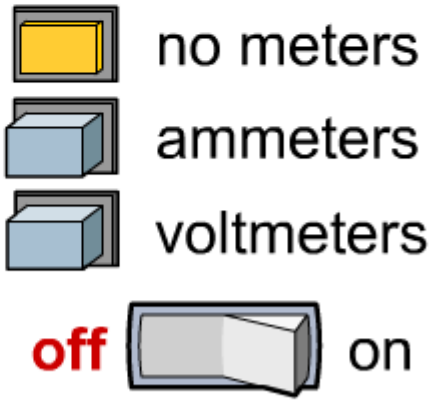


cells



bulbs





Series circuits: summary

Are these statements about series circuits true or false?

1.	Current is used up in a series circuit.	
2.	Ammeters are connected in series.	
3.	Voltmeters are connected in series.	
4.	Current varies around a series circuit if there are several components.	
5.	Supply voltage is shared between the components in a series circuit.	
6.	Increasing the number of cells increases both the voltage and current in a series circuit.	

true false

solve