



Section A

1) An electric current is the rate of flow of

- ☐ A: protons
- ☐ B: charge
- ☐ C: atoms
- ☐ D: volts

2) One Amp is a measurement equal to

- ☐ A: 1 Joule per Coulomb
- ☐ B: 1 Coulomb per second
- ☐ C: 1 Volt per Ohm
- ☐ D: 1 Volt per Coulomb

3) What is the name of the device used to measure the current flowing through part of a circuit?

- ☐ A: voltmeter
- ☐ B: ammeter
- ☐ C: current meter
- ☐ D: variable resistor

4) In a series circuit, electrical current

- ☐ A: is the same everywhere
- ☐ B: decreases further from the power supply
- ☐ C: is largest closest to the power supply
- ☐ D: always varies with time

5) One Volt is a measurement equal to

- ☐ A: 1 Joule per Coulomb
- ☐ B: 1 Coulomb per second
- ☐ C: 1 Volt per Ohm
- ☐ D: 1 Amp per Coulomb

6) The equation that shows the relationship between current, potential difference and resistance is

- ☐ A: $V = I \div R$
- ☐ B: $V = I \times R$
- ☐ C: $I = V \times R$
- ☐ D: $R = V \times I$

Match the parts of an atom to their correct descriptions

electron

proton

neutron

negative charge
outside the nucleus

positive charge
outside the nucleus

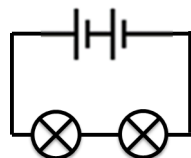
no charge
outside the nucleus

negative charge
inside the nucleus

positive charge
inside the nucleus

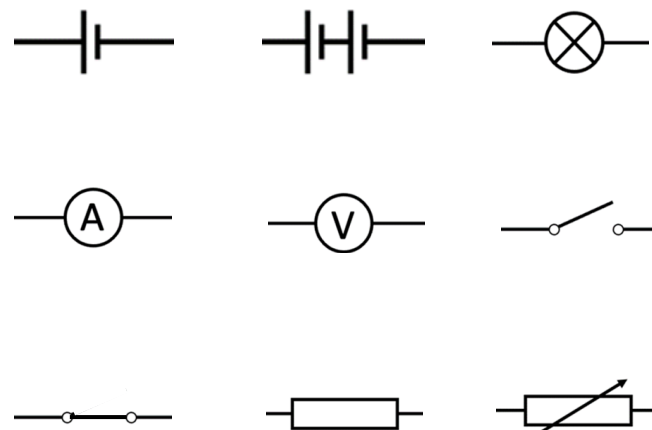
no charge
inside the nucleus

Draw a circuit where the bulbs will be twice as bright as the ones in the circuit shown below.



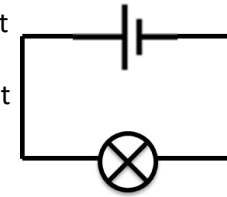
Draw a diagram of an atom and label the different parts.

Name each of the components represented by these symbols.

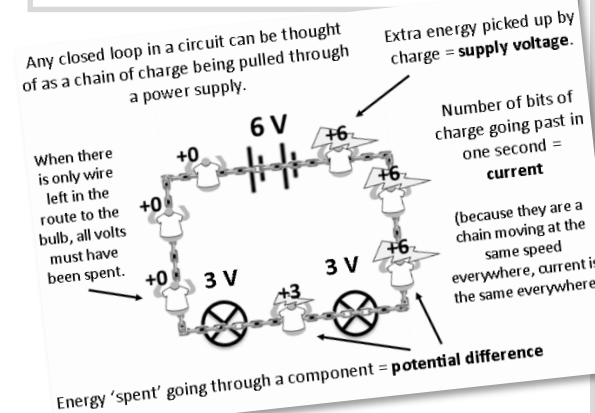


Section B

A student wants to test that a bulb is working so they build the circuit to the right →

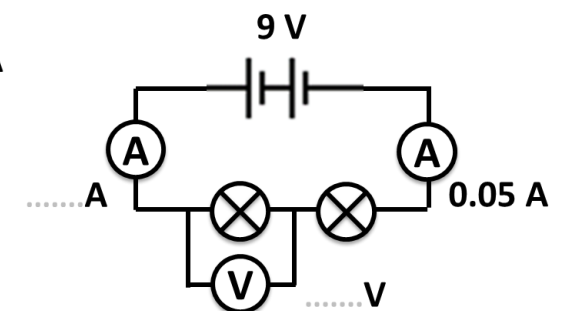
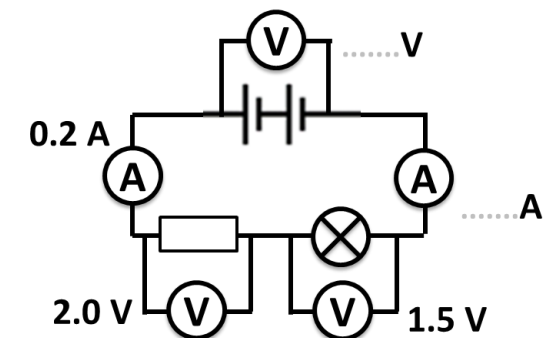
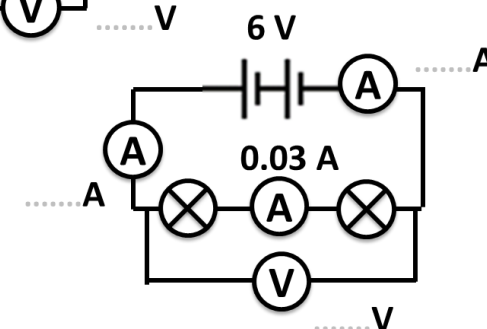
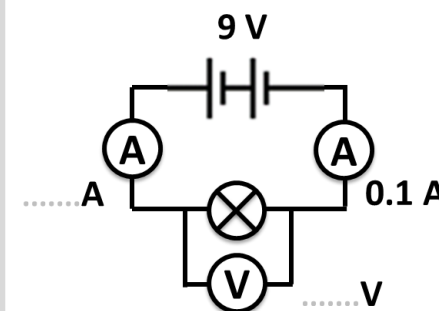


The students wants to measure the current flowing through the bulb and the potential difference across the bulb. Redraw the circuit but with an **ammeter** and a **voltmeter** in the correct place to allow them to take these measurements.



Add the missing values to these **series circuits**.

Assume bulbs in the same circuit as each other are identical.



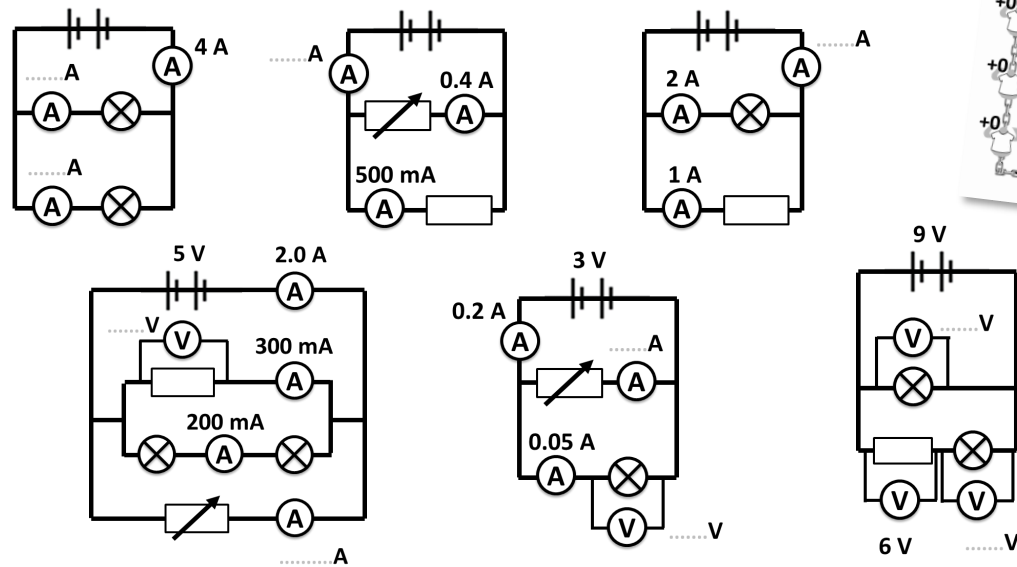
Build at least five true sentences using one part from each of the three rows.

Electric current	Potential difference
is defined as	is measured
In amps	Using a voltmeter
The difference in energy between two parts of a circuit	A flow of charged particles
	In volts
	Using an ammeter
	Across a component

Section C

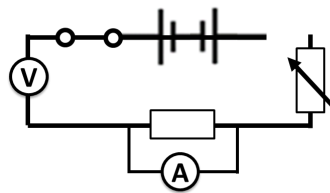
Add the missing values to these **parallel circuits**.

Assume bulbs in the same circuit as each other are identical.



A student tries to set up equipment to investigate the relationship between potential difference, current and resistance for a filament lamp. A diagram of the circuit they built is shown below but they have made 4 mistakes.

Describe what the student should do to correct the mistakes.



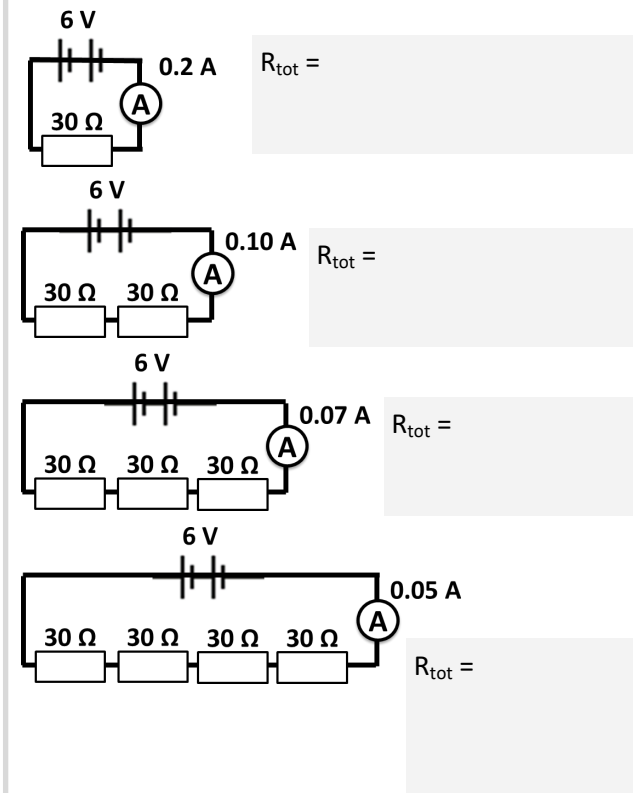
Parallel circuits have more than one loop, this means that **there are junctions** in the circuit

Where loops overlap the **current is added together.**

The largest current will be through the loop that is easiest to move around.

Section D

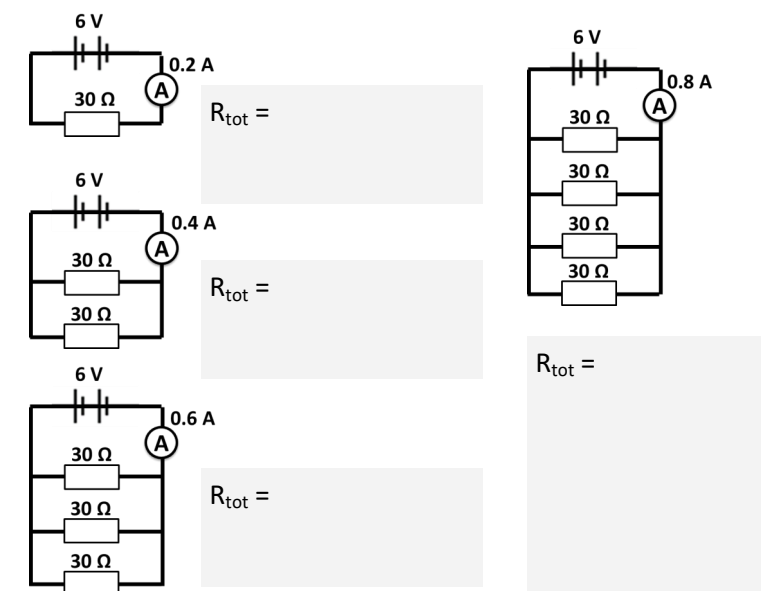
Use the supply voltage and ammeter reading on each of these circuits to calculate the **total resistance when resistors are connected in series**



Complete this sentence:

As the number of resistors connected in series increases, the total resistance

Use the supply voltage and ammeter reading on each of these circuits to calculate the **total resistance when resistors are connected in parallel**



Complete this sentence:

As the number of resistors connected in parallel increases, the total resistance

Key Word: **Resistance**
A measure of how much a device or material reduces the flow of charge through it.
measured in Ohms, symbol Ω

$$\text{energy transferred} = \text{charge moved} \times \text{potential difference} \quad E = Q \times V$$

charge = current $\times$ time	$Q = I \times t$
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Answers	44000	30	1.25	2.75	0.1	300	6.0
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A current of 2.5 A flows through a simple circuit. Calculate how much charge passes through the circuit in 120 s.

How much energy is transferred to a TV when it is connected to a 110 V power supply and 400 C of charge flows through its circuits?

A small motor has a resistance of $1.7\ \Omega$ when supplied with a current of $3.5\ \text{A}$. What is the potential difference across the motor?

n Calculate the potential difference across a $150\ \Omega$ resistor if it takes 30 s for 6 C of charge to flow through it.

A simple circuit is connected to a 12 V battery.
The total resistance of the circuit is 0.12 k Ω .
What is the magnitude of the current flowing through the circuit?

A total charge of 100 C flows through a photocopier in 1 minute and 20 seconds. Calculate the current flowing through the photocopier.

If you needed to make 800 C of charge supply 2.2 kJ of energy to a device, what potential difference would be necessary?