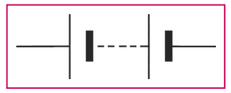
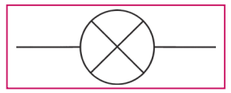
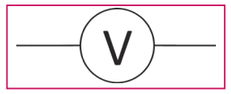
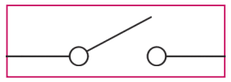
KS3 Electricity and Magnetism (Foundation) **Revision Mat**

a

Draw a line from the name of each component to the correct circuit symbol.

ammeter	
battery	
bulb	
cell	
switch (open)	
voltmeter	

b

Write down the unit of measurement for:

current _____

resistance _____

potential difference _____

What are the following components used to measure in a circuit?

ammeter _____

voltmeter _____

Complete the equation used to calculate resistance.

resistance = _____ ÷ _____

c

Give the key word from its definition.

The flow of electric charge. _____

A material that has low resistance and allows current to flow through it easily. _____

A material that has high resistance and does not allow current to flow through it. _____

The amount of push (energy) provided by the battery to a moving charge. _____

A measure of how difficult it is for a flow of charge to pass through a component. _____

d

Complete the sentences to describe the difference between series and parallel circuits.

Choose answers from the box.

blows	branches	complete	series	parallel	current

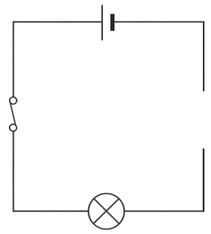
In a _____ circuit, the components are connected end to end in a loop. If one bulb breaks, none of the bulbs will light because the circuit is no longer _____ .

In a _____ circuit, the components are connected on separate _____. This gives the _____ several different paths for it to flow around. If one bulb _____ , the other bulbs will remain lit as the circuit is still complete.

e

For each of the following circuits, predict whether the bulb will light and explain why.

Circuit A

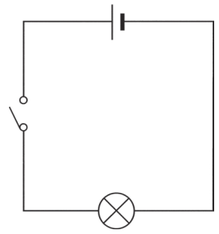


The bulb will/will not light because _____

_____

_____

Circuit B

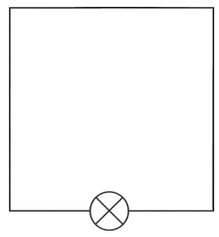


The bulb will/will not light because _____

_____

_____

Circuit C



The bulb will/will not light because _____

_____

_____

f

Match the name of each variable with the correct definition.

independent variable	This is a variable that must be kept the same.
dependent variable	This is the variable that you change or select the values for.
control variable	This is the variable that is measured in the investigation.

g

Draw a series circuit containing one bulb, a battery, an ammeter and a switch.

h

Draw a parallel circuit containing two bulbs, a battery and a switch that would allow both bulbs to be turned on.

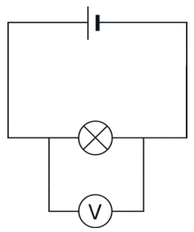
i

Complete the sentences.
Choose answers from the box.

ammeter	amps	charge	electrons
parallel	voltmeter	volts	series

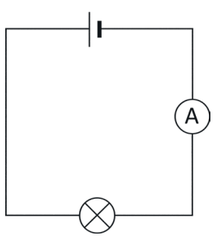
Potential difference tells us how hard a battery pushes the _____ around a circuit: the higher the potential difference, the bigger the push.

Potential difference is measured in _____ using a _____ connected in _____ with the component.



Current is the flow of _____ around a circuit. The higher the current, the faster the electrons move.

Current is measured in _____ using an _____ connected in _____ with the component.



j

Tick the correct box to show if each statement is true or false.

	True	False
All metals are magnetic.	☐	☐
All magnets have a north pole and a south pole.	☐	☐
The Earth has its own magnetic field.	☐	☐
Opposite poles repel.	☐	☐

Circle **three** magnetic metals in the list below.

aluminium	cobalt	copper
gold	iron	nickel

k

Tick the correct box to show if each statement is true or false.

	True	False
An atom has an equal number of protons and electrons.	☐	☐
An atom has an overall positive charge.	☐	☐
Neutrons are negatively charged.	☐	☐
If a material gains electrons, it becomes positively charged.	☐	☐

Explain why a person's hair stands on end if they touch the dome of a Van de Graaff generator.

_____

_____

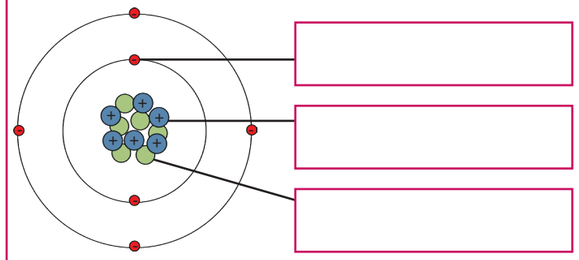
_____

l

Label the diagram of an atom.

Choose answers from the box.

electron	neutron	proton



Match the name of each subatomic particle to its charge.

electron	+1
neutron	0
proton	-1

m

Complete the sentences.
Choose answers from the box.

coils	electromagnet	less
more	stronger	weaker

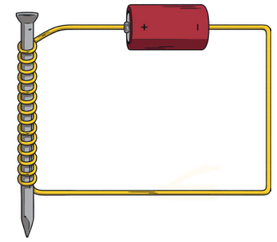
The strength of an _____ can be changed by changing the number of _____ of wire around an iron core.

The greater the number of coils, the _____the electromagnet. The stronger the electromagnet, the _____ paperclips it will pick up.

n

Use the key words to explain what the diagram below shows.

current
iron core
electromagnet
coil of wire



_____

_____

_____

_____

_____

Identify the variables in the electromagnet investigation.

independent variable

_____

dependent variable

_____

control variable

_____

o

Complete the table.

Length of wire (cm)	Potential Difference (V)	Current (A)	Resistance (Ω)
30	10	5	
60	10	2	

Describe how the length of a wire affects its resistance.

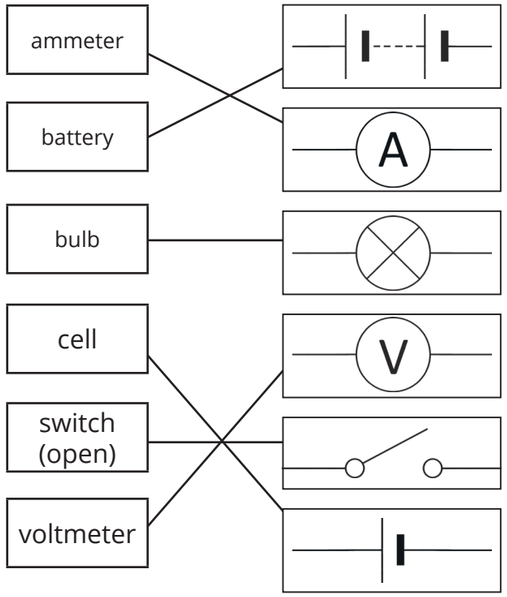
_____

_____

KS3 Electricity and Magnetism (Foundation) **Revision Mat Answers**

a

Draw a line from the name of each component to the correct circuit symbol.



b

Write down the unit of measurement for:

current **amps (A)**

resistance **ohms (Ω)**

potential difference **volts (V)**

What are the following components used to measure in a circuit?

ammeter **current**

voltmeter **potential difference**

Complete the equation used to calculate resistance.

resistance = **potential difference** ÷ **current**

c

Give the key word from its definition.

The flow of electric charge. **current**

A material that has low resistance and allows current to flow through it easily. **conductor**

A material that has high resistance and does not allow current to flow through it. **insulator**

The amount of push (energy) provided by the battery to a moving charge. **potential difference**

A measure of how difficult it is for a flow of charge to pass through a component. **resistance**

d

Complete the sentences to describe the difference between series and parallel circuits.
Choose answers from the box.

blows	branches	complete	series	parallel	current

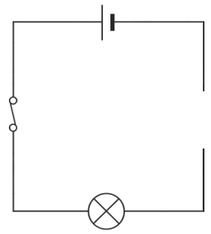
In a **series** circuit, the components are connected end to end in a loop. If one bulb breaks, none of the bulbs will light because the circuit is no longer **complete**.

In a **parallel** circuit, the components are connected on separate **branches**. This gives the **current** several different paths for it to flow around. If one bulb **blows**, the other bulbs will remain lit as the circuit is still complete.

e

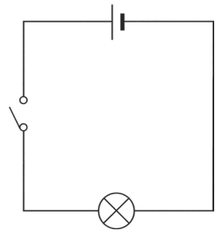
For each of the following circuits, predict whether the bulb will light and explain why. Please insert answer lines under each diagram as shown below.

Circuit A



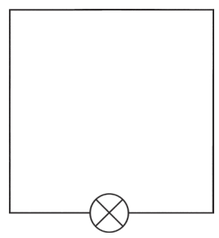
The bulb will/**will not** light because **there is a broken wire in the circuit, so the circuit is incomplete.**

Circuit B



The bulb will/**will not** light because **the switch is open, so the circuit is incomplete.**

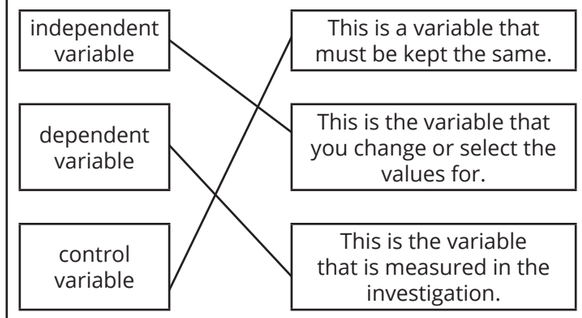
Circuit C



The bulb will/**will not** light because **there is not a cell or battery to provide energy to the bulb.**

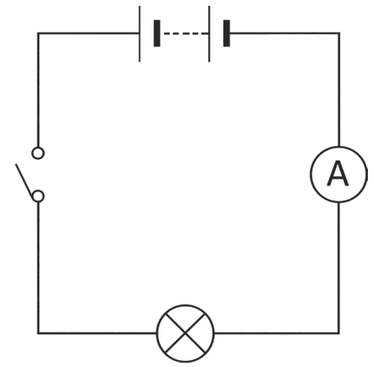
f

Match the name of each variable with the correct definition.



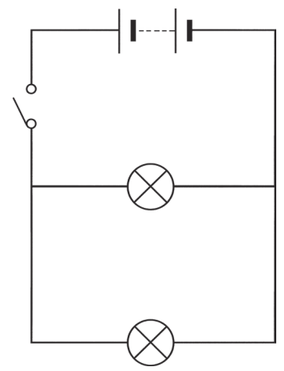
g

Draw a series circuit containing one bulb, a battery, an ammeter and a switch.



h

Draw a parallel circuit containing two bulbs, a battery and a switch that would allow both bulbs to be turned on.



KS3 Electricity and Magnetism (Foundation) **Revision Mat Answers**

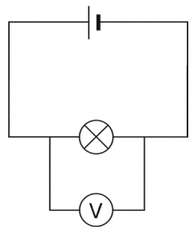
i

Complete the sentences.
Choose answers from the box.

ammeter	amps	charge	electrons
parallel	voltmeter	volts	series

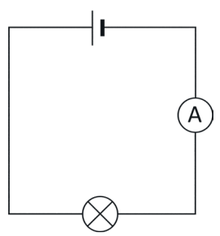
Potential difference tells us how hard a battery pushes the **electrons** around a circuit: the higher the potential difference, the bigger the push.

Potential difference is measured in **volts** using a **voltmeter** connected in **parallel** with the component.



Current is the flow of **charge** around a circuit. The higher the current, the faster the electrons move.

Current is measured in **amps** using an **ammeter** connected in **series** with the component.



j

Tick the correct box to show if each statement is true or false.

	True	False
All metals are magnetic.	☐	✓
All magnets have a north pole and a south pole.	✓	☐
The Earth has its own magnetic field.	✓	☐
Opposite poles repel.	☐	✓

Circle **three** magnetic metals in the list below.

aluminium **cobalt** copper
gold **iron** **nickel**

k

Tick the correct box to show if each statement is true or false.

	True	False
An atom has an equal number of protons and electrons.	✓	☐
An atom has an overall positive charge.	☐	✓
Neutrons are negatively charged.	☐	✓
If a material gains electrons, it becomes positively charged.	☐	✓

Explain why a person's hair stands on end if they touch the dome of a Van de Graaff generator.

When the person touches the dome, electrons are transferred from the dome to the person's hair.

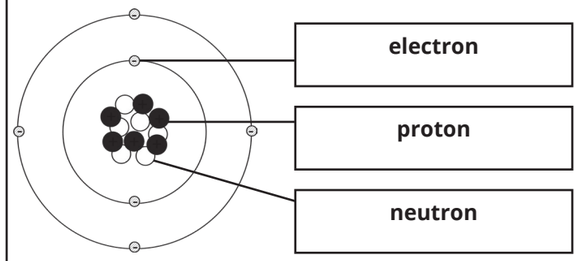
Their hair stands on end because each strand of hair is negatively charged and the same charges repel.

l

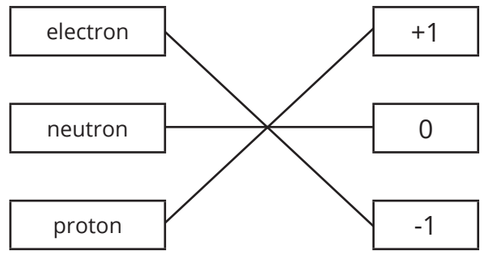
Label the diagram of an atom.

Choose answers from the box.

electron	neutron	proton



Match the name of each subatomic particle to its charge.



m

Complete the sentences.
Choose answers from the box.

coils	electromagnet	less
more	stronger	weaker

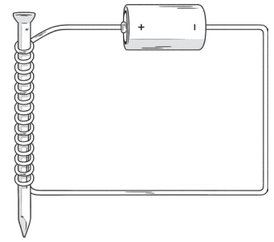
The strength of an **electromagnet** can be changed by changing the number of **coils** of wire around an iron core.

The greater the number of coils, the **stronger** the electromagnet. The stronger the electromagnet, the **more** paperclips it will pick up.

n

Use the key words to explain what the diagram below shows.

current
iron core
electromagnet
coil of wire



An electromagnet is made by supplying a current through a coil of wire. The strength of the electromagnet can be increased by wrapping the coil around an iron core.

Identify the variables in the electromagnet investigation.

independent variable

number of coils of wire

dependent variable

number of paperclips picked up

control variable

potential difference of the battery, current supplied to the wire, length of wire, material of the core

o

Complete the table.

Length of wire (cm)	Potential Difference (V)	Current (A)	Resistance (Ω)
30	10	5	**2**
60	10	2	**5**

Describe how the length of a wire affects its resistance.

The longer the wire, the higher its resistance.