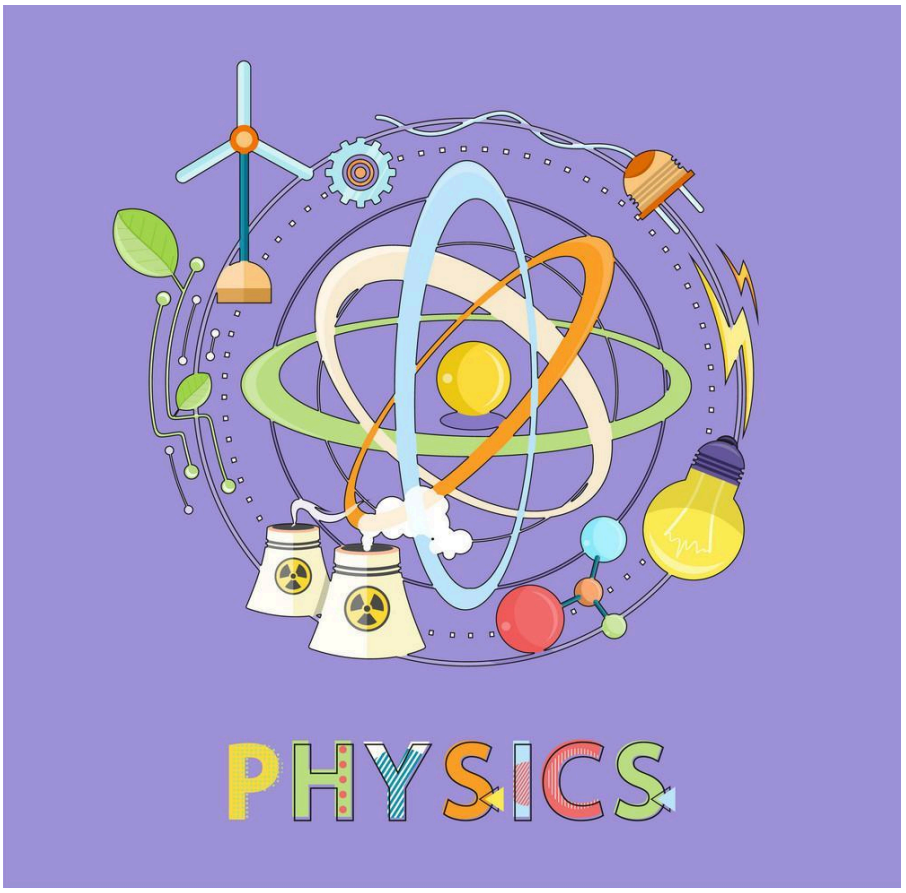
Year 9

Physics



Teacher: Mr Trent

Name:

Week	Date	Topic	Homework	Revision	Assessment
1	9-13 Jan	Kidneys and Excretion & DNA Intro	DNA Presentation		
2	16-20 Jan	Variation and Inheritance	Adaptations Animal		19th & 20th TET
	23-27 Jan				
3	30 -3 Jan	Evolution and Natural Selection	Climate Change Part 1	Chemical Structures and Properties	Cycle Test 2nd Feb
4	6-10 Feb	Ecosystems and The Carbon Cycle	Climate Change Part 2	Chemical Structures and Properties	
5	13-18 Feb	Energy and Heat Transfer	Heat Transfer Summary	Chemical Bonding	
6	20-24 Feb	Sound Waves	Identifying Sound Wave Guide Book	Chemical Bonding	
7	27 Feb- 3 Mar	Current and Voltage	Symbols Quiz	Cycle Test Revision	Cycle Test 2nd March
8	6 - 10 Mar	Measuring Resistance	Calculating Voltage, Current and Resistance	Chemical Reactions	
9	13-17 Mar	Earth's Crust	Tectonic Plates Jig Saw Puzzle	Chemical Reactions	
10	20-24 Mar	Clouds, Stars and The Moon	Teach the Teacher Task	Chemical Reactions	
11	27 – 31 Mar	Recap and Revise	Recap and Revise	Cycle Test Revision	Cycle Test 30th March
	4th - 8th April				
12	10th -14 April	Recap	Revise	Revise	
13	17-21 April	Checkpoint Exams	Checkpoint Exams	Checkpoint Exams	
14	24 -28 April	**Science Fair**	**Science Fair**	**Science Fair**	
15	1 – 5 May	**Science Fair**	**Science Fair**	**Science Fair**	Cycle Test 4th May
16	8 -12 May	Recap	Revise	Revise	
17	15-19 May	Recap	Revise	Revise	
18	22–26 May	Assessment Week			
19	29 – 2 June	STEM and IGCSE Preparation	STEM and IGCSE Preparation	STEM and IGCSE Preparation	
20	5 – 9 June	STEM and IGCSE Preparation	STEM and IGCSE Preparation	STEM and IGCSE Preparation	
21	12 – 16 June	STEM and IGCSE Preparation	STEM and IGCSE Preparation	STEM and IGCSE Preparation	

nonrenewable resource
renewable resource
electromagnetic
hydroelectric
gravitational
fossil fuels
natural gas
geothermal
electrical
mechanical
vibration
potential
chemical
uranium
biomass
fission
nuclear
thermal
elastic
kinetic
fusion
energy
waves
solar
sound
joule
coal
wind
oil
sun

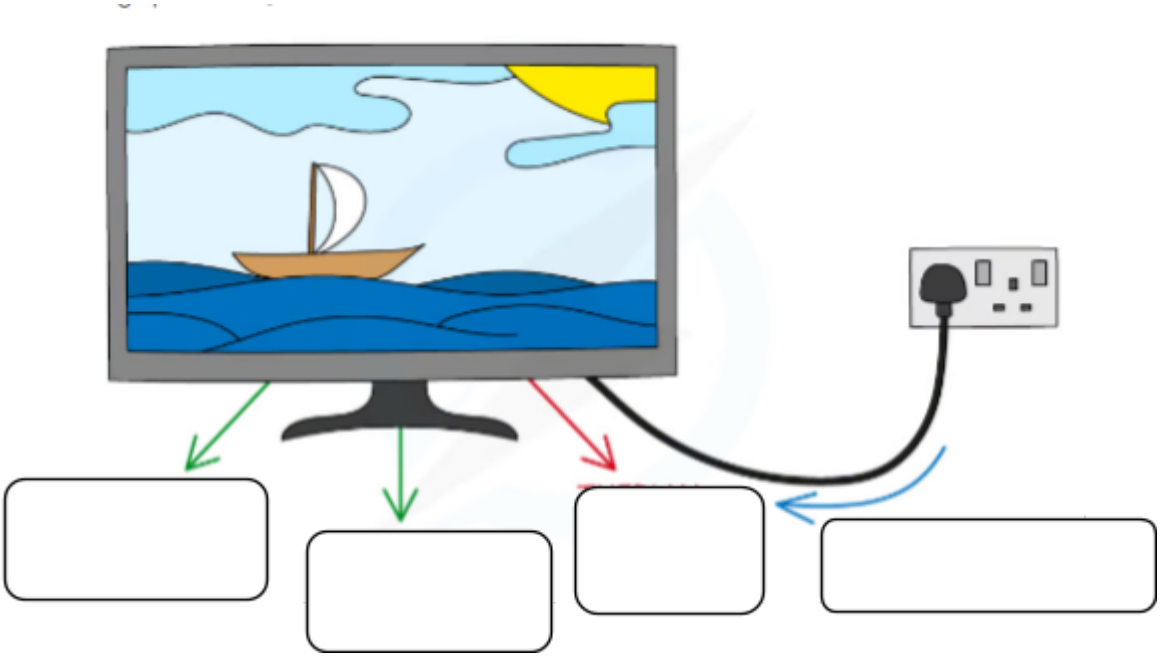
U E C H E M I C A L Q Y X W N T E K G M L M D K
C R D B K M P E L A S T I C T M A D R R L P K R
S H A F V H Y U Y Q H U N S F G P Q N F H C A E
M Q I N W V W P T F E Q O V O B V Y O U X L E N
E A H N I E S Y N K L L S K S T G X Q D O L C E
P F I G A U L E H Y A L T M S K S H J X T S R W
P T I L O T M U Q R Z L I G I C J R Z D B E U A
H F N S T P U A O S V F P Z L T H E R M A L O B
I E Q O S X Q R A J D U S J F K A D T B C L S L
T E O P I I O X A A T C D I U M C L L I A T E E
B Z R E W S O W S L G S F I E H G A T C U C R R
E E B M D Z U N C S G T L L L U I E I D L I E E
L I T N N G Q F H Q A A P N S T N N L J A R L S
E L T G X Q O Q M L O X S Z N I A S Q N N T B O
C G Z N W V B W D C F G N E K H N F Q U O C A U
T F D Z O E P W A V E S T N C U R U Y C I E W R
R H Q Z A C M P P P E O W E Q V F Z S L T L E C
I L X L E N E R G Y P K M K T E L K J E A E N E
C I V W I B B Q N B V I B R A T I O N A T O E V
A K X Z N O C W I N D I H N O O Y J Y R I R R F
L W E B L Q M J M A R Z R F F L F O K G V D N T
I L J E U G E O T H E R M A L Y C H R X A Y O B
C D W R F E L E C T R O M A G N E T I C R H N H
X O E L Y A G O W A Y I S S A M O I B E G R D W

9Pf.03 Know that energy is conserved, meaning it cannot be created or destroyed.
Energy

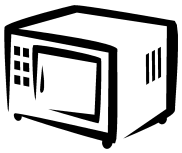
List as many types of energy as you can

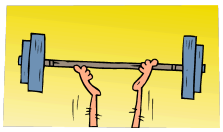
What are the 5 types of stored energy?
Match the Energy store with its description and example.

Name of Energy Store		Description		Example
		(more in an object lifted above its planet)		Earth
		(in food, fuel or batteries)		Runner
		(in a moving object)		Burger and Fries
		(in an object at high temperature)		Elastic Band
		(in a stretched, squashed or twisted object)		Hot Frypan



Energy Circus

Device	Energy Transfer
	An electric toaster transfers _____ energy to _____ energy, _____ energy, _____ energy and _____ _____ energy.
	A light bulb transfers _____ energy to _____ energy and _____ energy.
	Speakers transfer _____ energy to _____ energy.
	A hair dryer transfers _____ energy to _____ energy, _____ energy and _____ energy
	A microwave oven transfers _____ energy to _____ energy, _____ energy and _____ energy.
	A vacuum cleaner transfers _____ energy to _____ energy, _____ energy and _____ energy
	A speed boat transfers _____ energy to _____ energy, _____ energy and _____ energy
	A Bunsen burner transfers _____ energy to _____ energy and _____ energy.
	A burning match transfers _____ energy to _____ energy and _____ energy.
	A solar cell transfers _____ energy to _____ energy

	A catapult transfers _____ energy to _____ energy.
	Lifting a heavy mass transfers _____ energy to _____ energy and _____ _____ energy.
	A trampoline transfers _____ energy to _____ energy and _____ _____ energy
	A runner running transfers _____ energy to _____ energy, _____ energy and _____ energy.
	An iron transfers _____ energy to _____ energy and _____ energy.

9Pf.03 Know that energy is conserved, meaning it cannot be created or destroyed.

Energy Efficiency

The Law of Conservation of Energy :

1. An elastic band is pulled back and stores 10J of elastic potential energy, when it is released what sort of energy will it transfer to and how much of that energy store will there be?

2. A phone is used 2000J of electrical energy before its charge ran out. How much chemical energy was stored in the battery?

3. A light bulb uses 30J of electrical energy. 20J of that energy was transferred to light, how much was transferred to heat? Explain how you know.

When energy is changed some of it is always wasted.

We can measure the amount of useful energy we get by the efficiency.

$$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}} \times 100$$

The examples below all show energy changes in engines. The **work** that they do is their 'useful energy out'.

Calculate their efficiencies.

1. A petrol engine takes 1000J of chemical energy and does 250J of useful work.

2. A diesel engine uses 6000J of chemical energy and does 2100J of useful work.

3. An electric motor uses 50J of electrical energy and does 40J of useful work.

4. A cyclist (a human engine) has 200J of energy and does 30J of useful work.

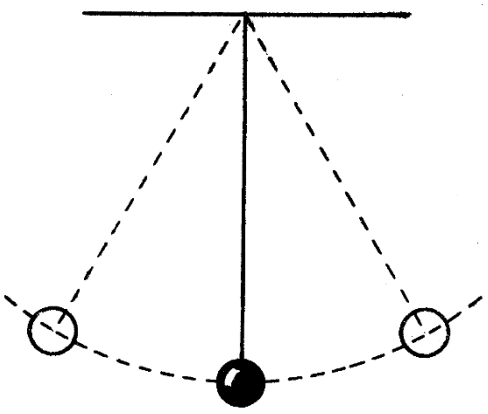
The following questions are harder; you will need to decide what form the **useful energy** is in.

5. A rocket engine takes in 800J of chemical energy and changes this into 480J of kinetic energy and 320J of heat energy.

6. A jet engine gas turbine takes in 1200J of chemical energy and gives out 960J of kinetic, 180J of heat and 60J of sound energy.

7. A TV takes in 600J of electrical energy and gives out 300J of light, 240J of sound and 60J of heat energy (be careful here!).

8. *A bus is travelling through town, with a mass of 5040kg and kinetic energy of 493900J. How fast is it travelling?*



9Pf.02 Describe the difference between heat and temperature.

Describe the difference between heat and temperature.

9Pf.04 Know that thermal energy will always transfer from hotter regions or objects to colder ones, and this is known as heat dissipation.
9Pf.06 Explain cooling by evaporation.
9Pf.05 Describe thermal transfer by the processes of conduction, convection and radiation.

Conduction

Starter: State the 4 principles of particle theory:
1

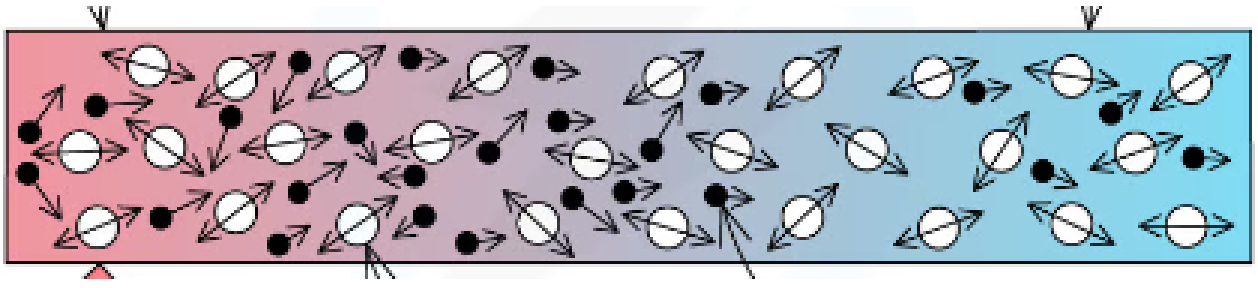
2

3

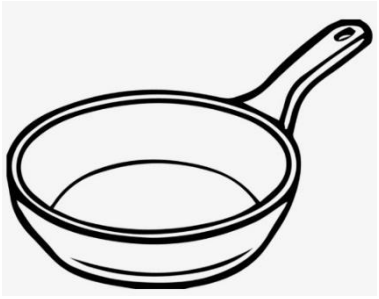
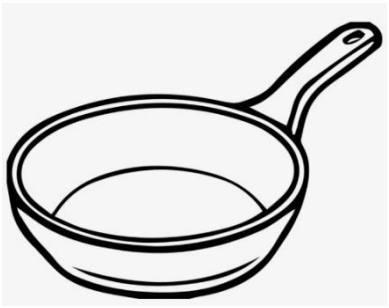
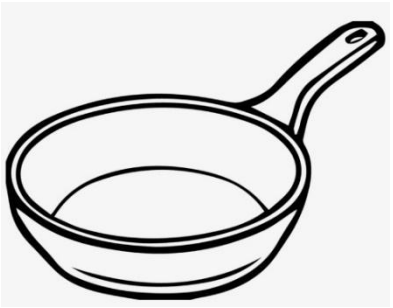
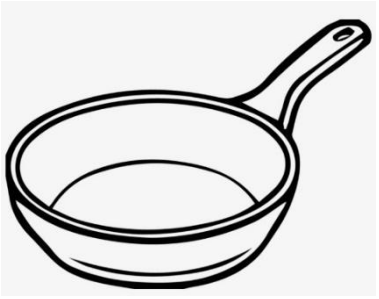
4

Draw the particles in a solid, liquid and gas

Conduction is:

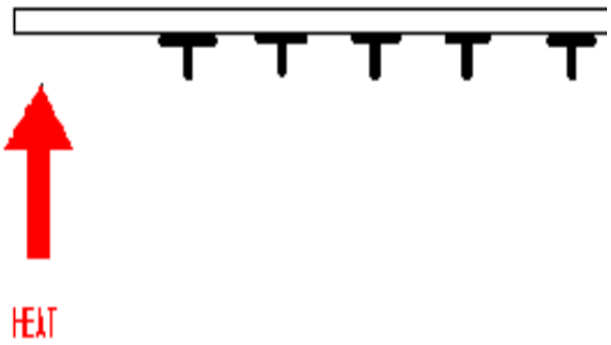


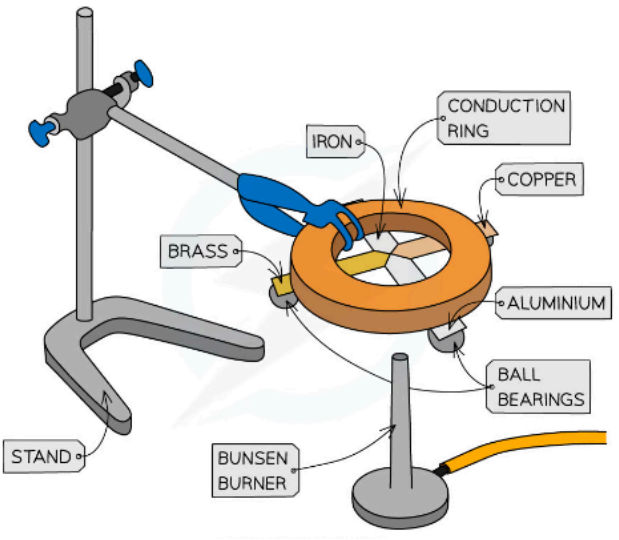
Draw and annotate what happens to the particles in the fry pan

Vibrate Heat Transferring Energy Kinetic Move Faster Collide Causing

Testing Conduction





Conclusion:

……

……

……

……

……

……

……

……

C_____

Task 1:

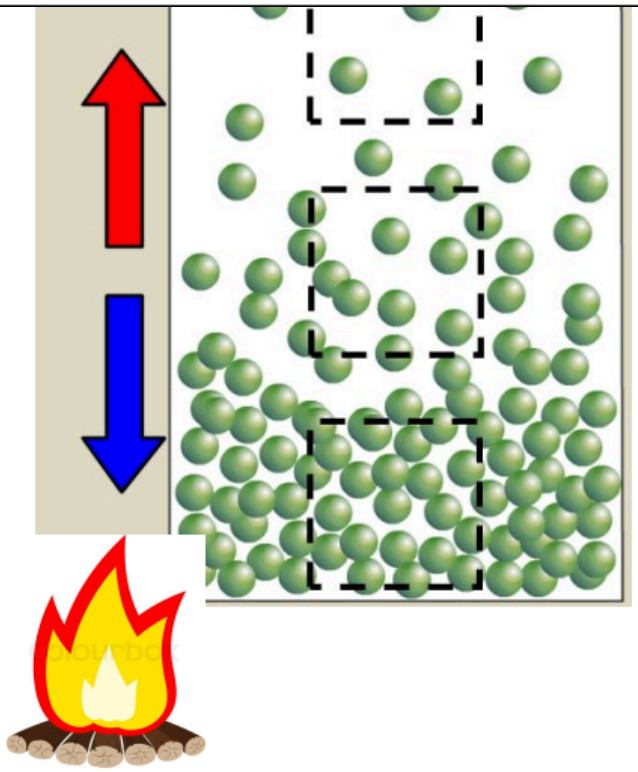
- Heat can be transferred from one place to another by c_____.
- L_____ and gases transfer heat through convection
- The p_____ in these fluids (liquids and gases) can move from place to place.
- Convection occurs when particles with a _____ of heat energy in a liquid or gas move and take the place of particles with l_____ heat energy.

Task 1: Circle the correct term

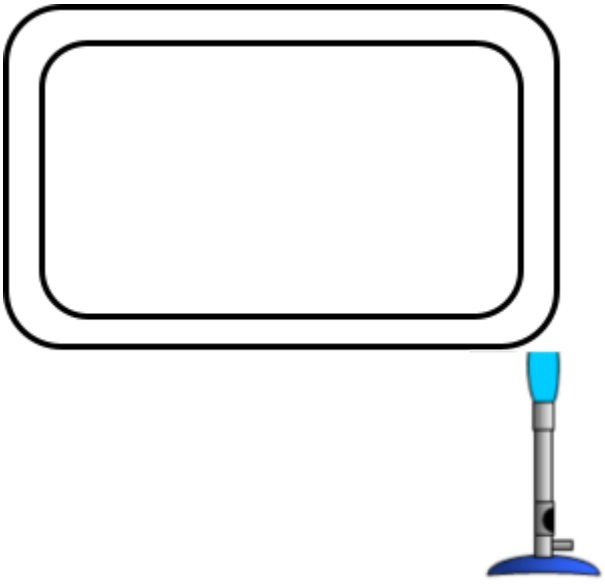
- Cold particles mean they are moving (more/less)
- If they are moving (more/less), that means they are (more/less) dense
- (More/Less) dense means they will (rise/fall)
- Hot particles mean they are moving (more/less)
- If they are moving (more/less), that means they are (more/less) dense

- (More/Less) dense means they will (rise/fall)

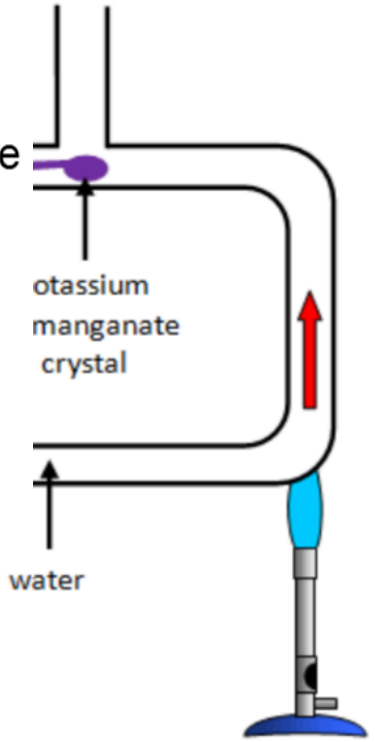
Checkpoint Box:



Task 3: Describe what you can observe (annotate and describe what the particles are doing)



Closer Together
Convection
More
Dense
Less
Slower
Fall
Cooled
Particles
Heated
Moving
Further Apart
Move
Faster
Rise
Transfer
Liquid



Describe what you can see using as many key words as you can (you can use a word more than once).

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

……

Radiation

There are three methods of heat _____, conduction, convection and radiation. Radiation is ____ only method which does not require _____. Because it does not require particles _____ can travel through a vacuum; this ___ how heat reaches us from the _____. All hot objects emit radiation. Objects _____ are dark colours absorb the energy _____ them to heat up. Objects which are _____ reflect the radiation.

Words: that radiation into particles shiny transfer the is sun

Surface	Absorption	Reflection
Dark and matt		
Light and shiny		

Decide if the following statements are true or false.

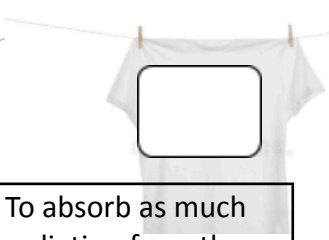
- ☐ All hot objects emit radiation
- ☐ White colours absorb the most radiation
- ☐ The hotter an object is the more radiation it will absorb
- ☐ Radiation can travel through space
- ☐

A good insulator can stop radiation

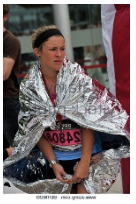
☐ Radiation cannot travel through glass

Which order will the clothes dry first and why?





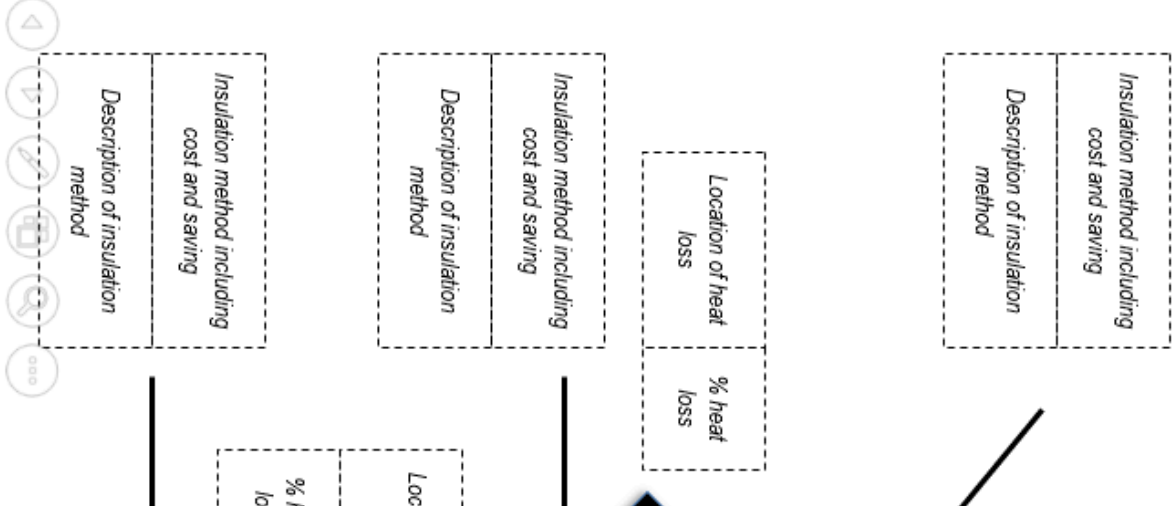
Make the correct links

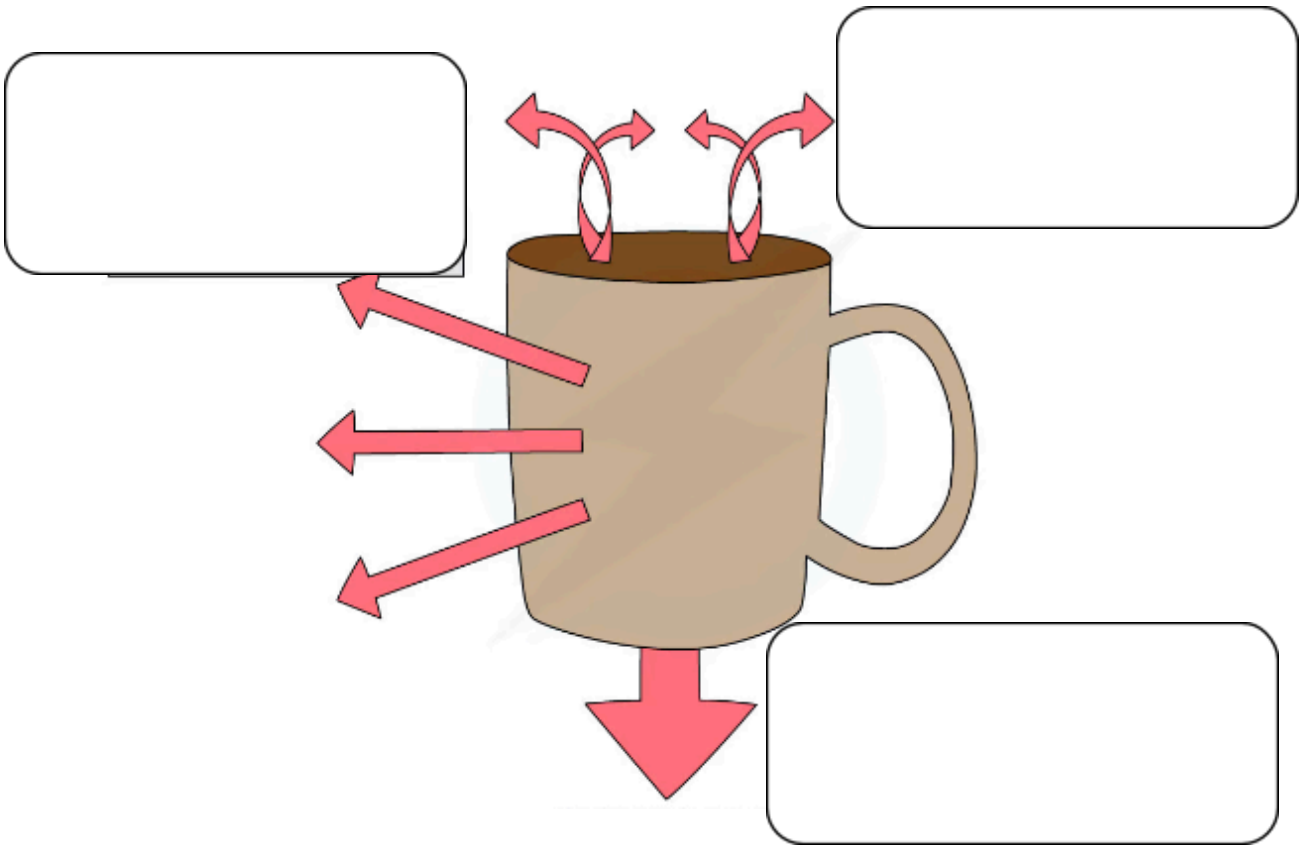
People paint houses in hot countries white		To absorb as much radiation from the sun as possible		
Paint solar panels for making electricity black		To reflect the heat back into the drink and keep it warm		
People are wrapped in shiny foil after a marathon		To reflect their own heat back into them		
Thermos flasks are shiny on the inside		To reflect the heat of the sun away and keep them cool		

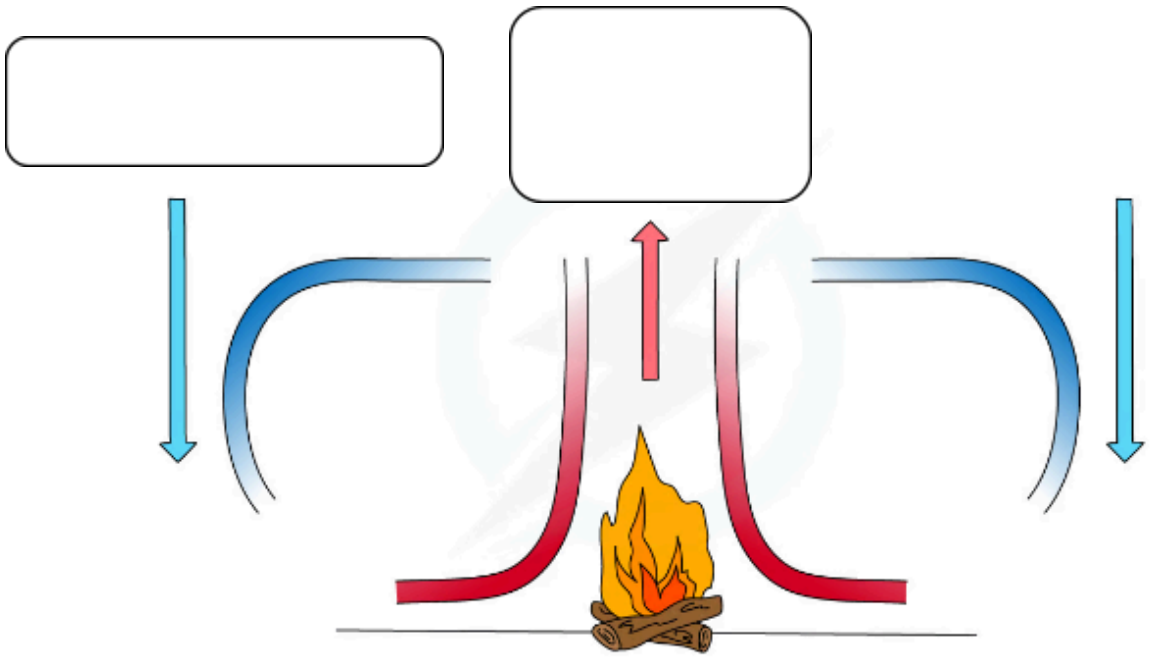
Results

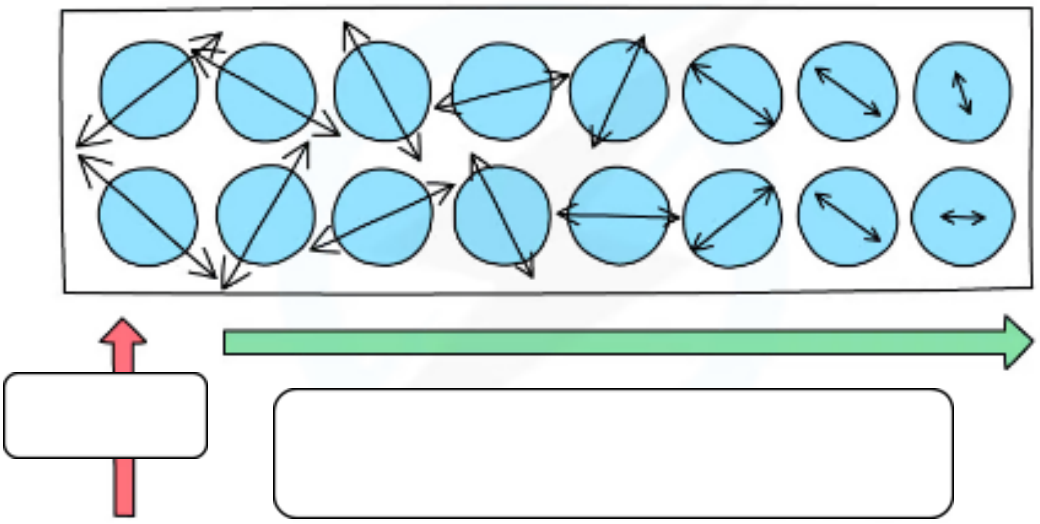
Time (s)	Temperature of water in black beaker (°C)	Temperature of water in silver beaker (°C)
0		
30		
60		
90		
120		
150		
180		

Glue Graph Here









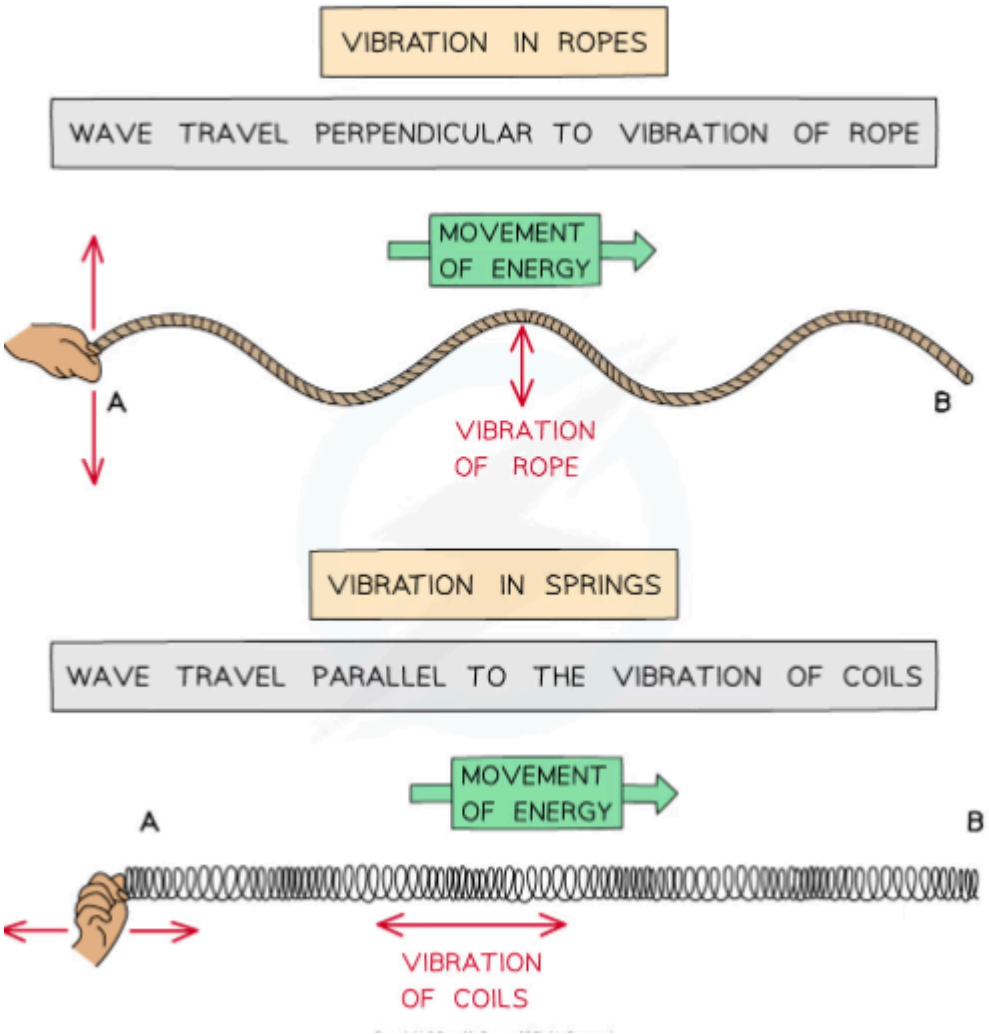
Sound Comprehension

Waves transfer **energy** and **information**

Waves are described as **oscillations** or **vibrations** about a fixed point

- For example, **ripples** cause particles of water to oscillate up and down
- **Sound** waves cause particles of air to vibrate back and forth

Wave vibrations can be shown on **ropes** (transverse) and **springs** (longitudinal)



A crest, or a peak, is defined as:

The highest point on a wave above the equilibrium, or rest, position

A trough is defined as

The lowest point on a wave below the equilibrium, or rest, position

Amplitude is defined as:

The distance from the undisturbed position to the peak or trough of a wave

It is given the symbol **A** and is measured in **metres (m)**

Wavelength is defined as:

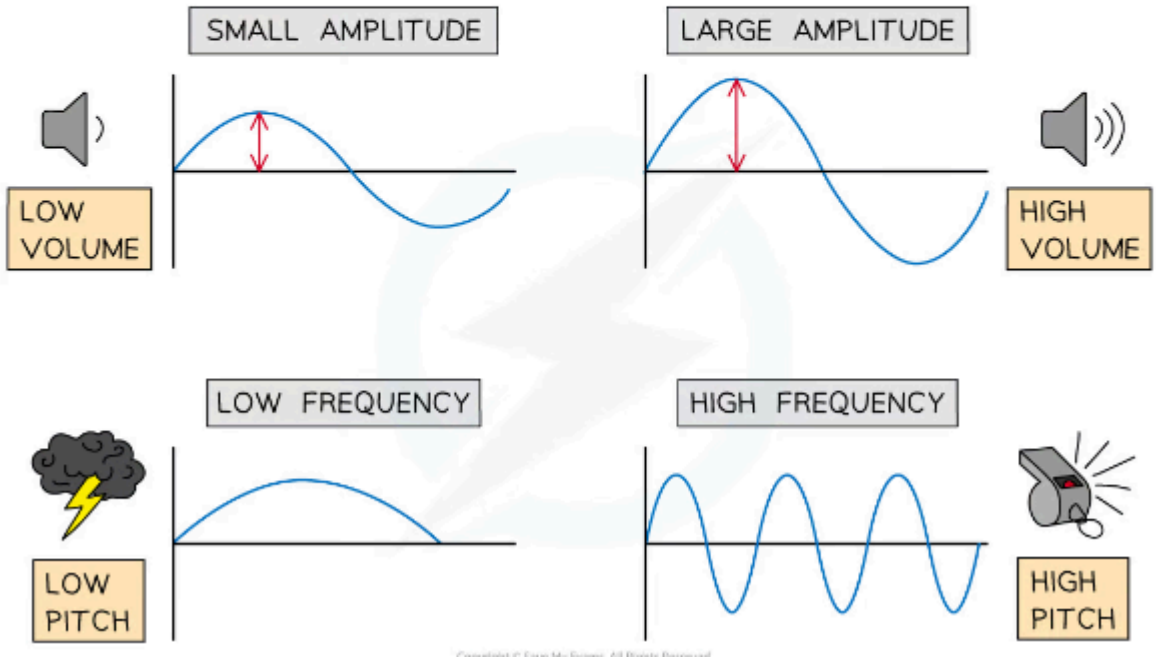
The distance from one point on the wave to the same point on the next wave

Frequency is defined as:

The number of waves passing a point in a second

Frequency is given the symbol ***f*** and is measured in **Hertz (Hz)**

- The frequency of a sound wave is related to its **pitch**
  - Sounds with a **high** pitch have a **high** frequency (or short wavelength)
  - Sounds with a **low** pitch have a **low** frequency (or long wavelength)
- The amplitude of a sound wave is related to its **volume**
  - Sounds with a **large** amplitude have a **high** volume
  - Sounds with a **small** amplitude have a **low** volume



9Ps.01 Draw and interpret waveforms, and recognise the link between loudness and amplitude, pitch and frequency.

State the 4 principles of particle theory of matter

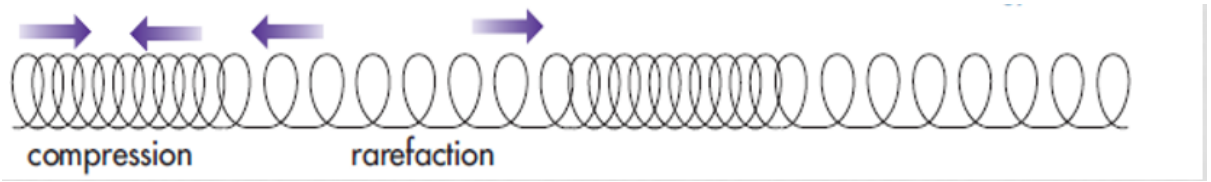
1.

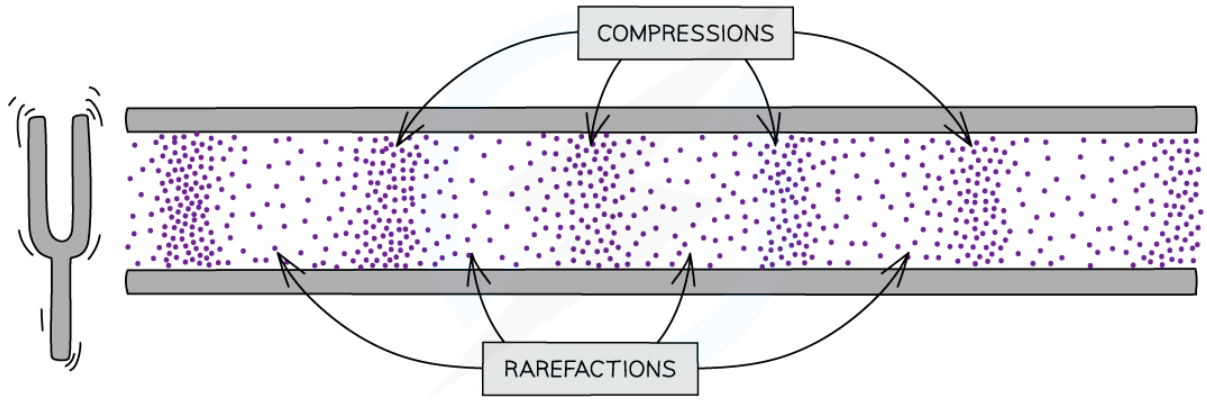
2.

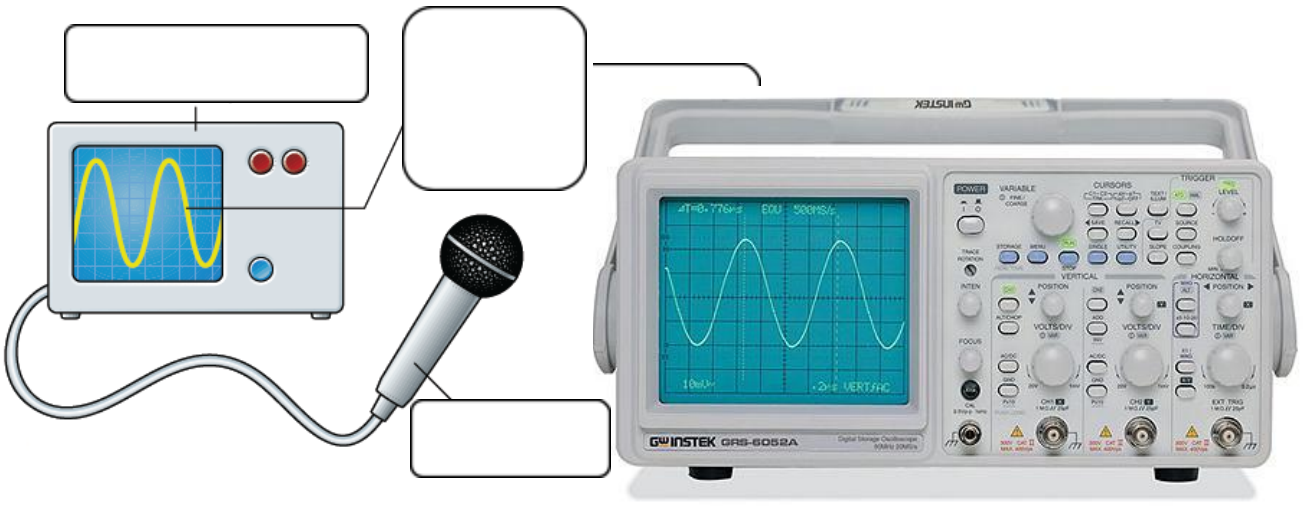
3.

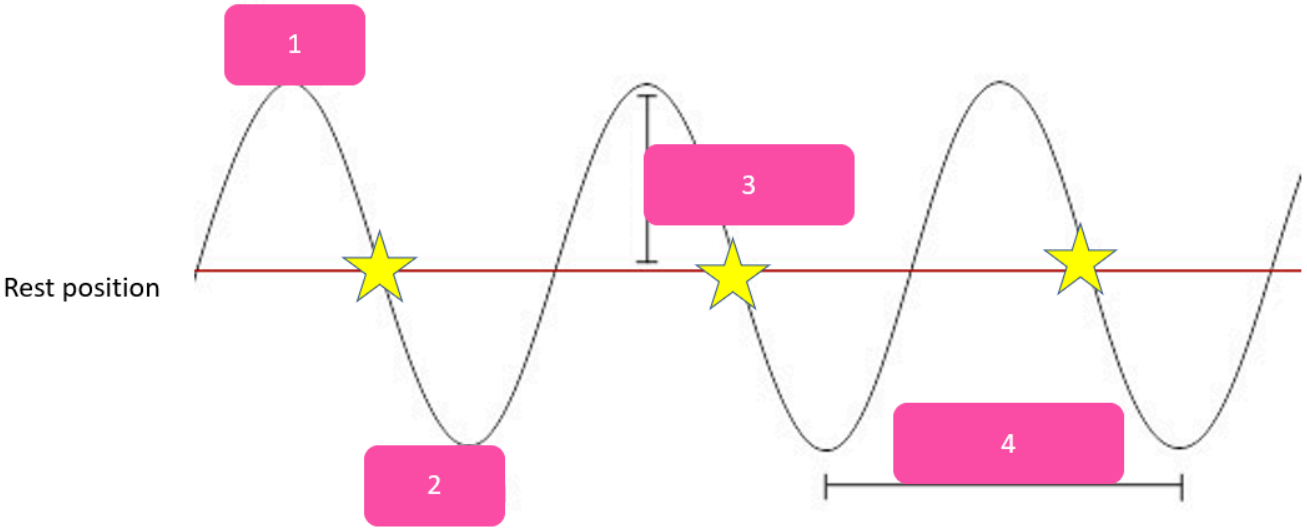
4.

- Sound is a form of_____ that travels as a _____ wave.
- Sound is caused by _____
- Sound travels at a speed of _____m/s in.
- Sound travels fastest through _____ because_____.
- _____ **Waves** – motion of the particles is <u>parallel</u> to the motion of the wave. Sound is a longitudinal wave

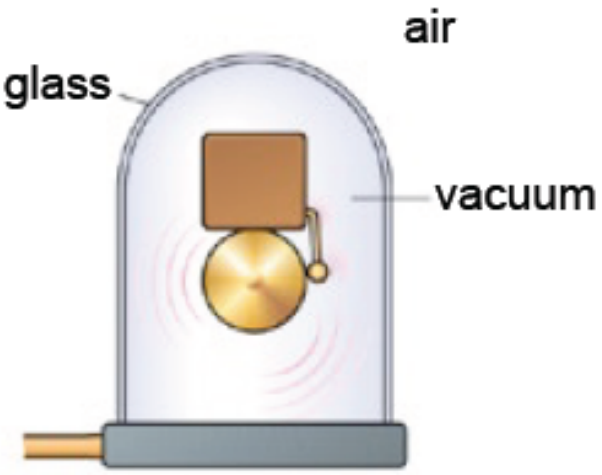








Explain what will happen in the image below and give reasons why.



9Ps.02 Use waveforms to show how sound waves interact to reinforce or cancel each other.

Suggest what will happen when the waves clash.

Explain how this is related to sound.

Find someone who knows the answer to each term.

Term	Person	Answer
oscillation		
transverse		
compression		
longitudinal		

rarefaction		
amplitude		
frequency		
wavelength		
peak		
trough		
pitch		
frequency		
loudness		
waveform		

Light and sound waves are both forms of energy. There are two ways that energy can travel in waves; by **longitudinal** or **transverse** waves.

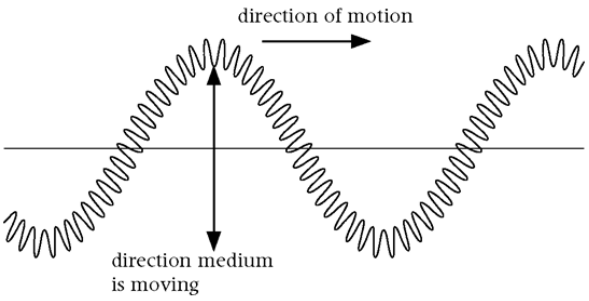
1. What is the difference between longitudinal and transverse waves?

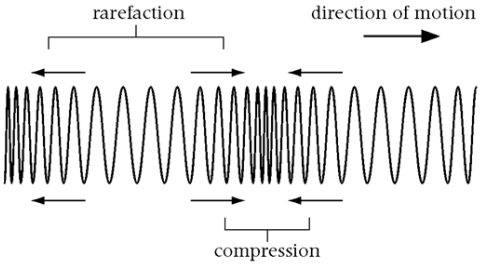
2 Draw and label each wave type and say which represents a light wave and which a sound wave.

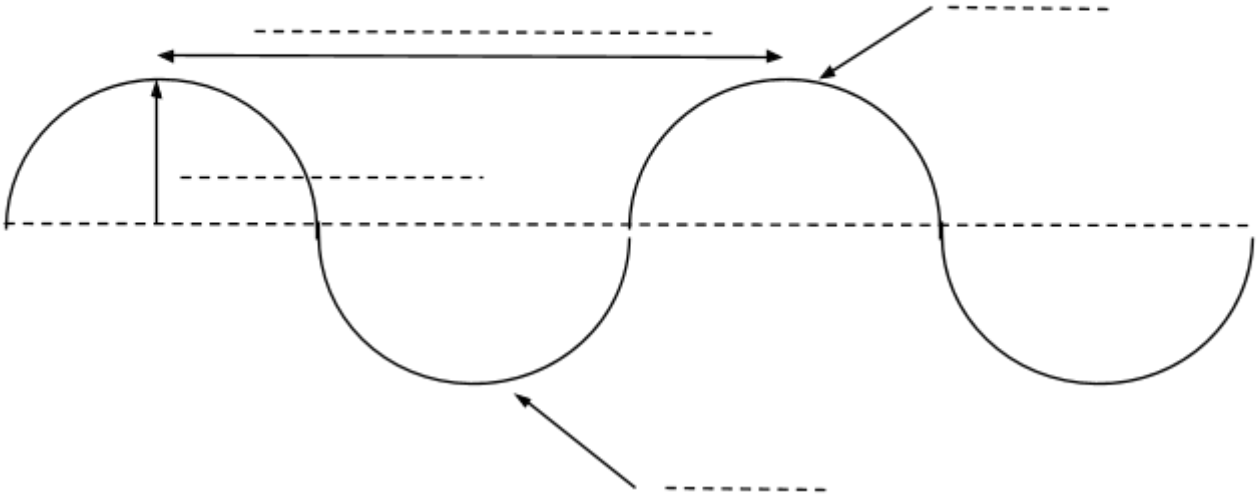
3 What sort of wave is produced when air particles are compressed and rarefied?

4 Give three examples of transverse waves.

5 What type of wave is a sound wave?







Parts of a wave

undisturbed position

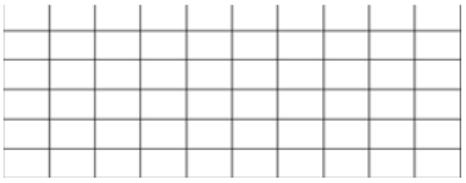
Label the wave using the words ***trough, peak, wavelength, amplitude***

Use these words to complete the paragraph below

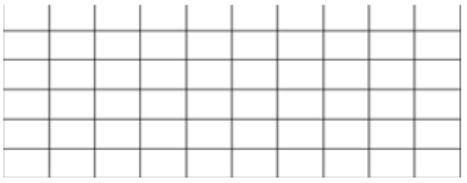
peaks	**energy**	**frequency**	**pitch**	**two**
wavelength	**hertz**	**crest**	**amplitude**	**colour**

The distance between two consecutive _____ of a wave is called the _____ of the wave. The furthest point of wave above the undisturbed position is called the peak or

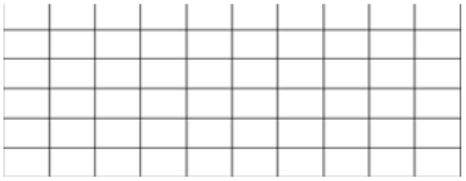
1. Loud, high pitched tone.



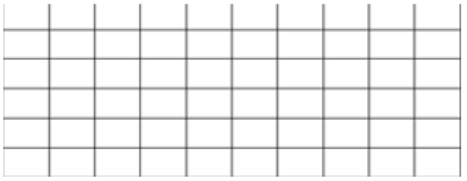
2. Loud, low pitched tone.



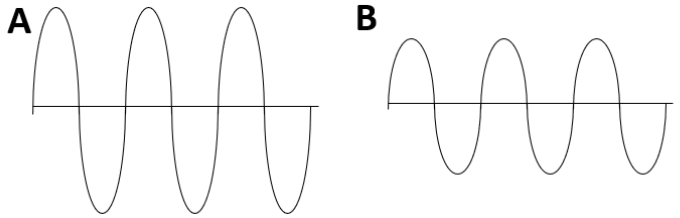
3. Quiet, high pitched tone.



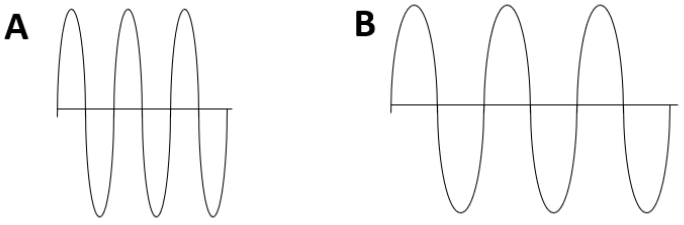
4. Quiet, low pitched tone.



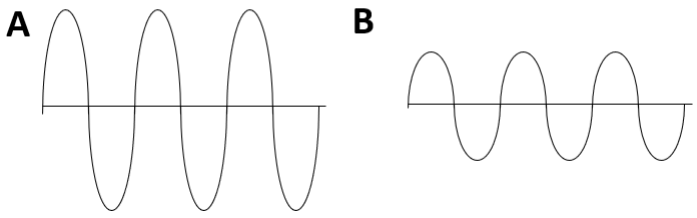
Loudest sound?



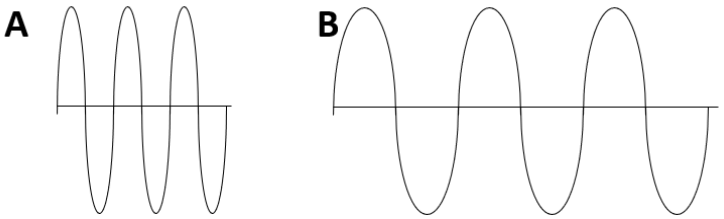
Highest pitch?



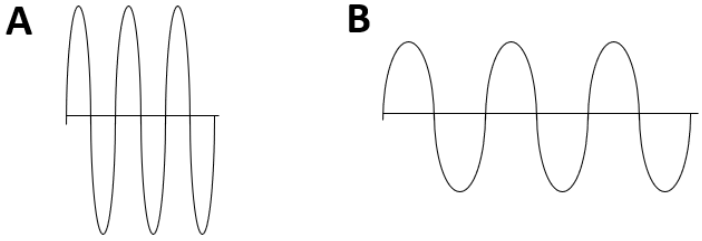
Quietest sound?



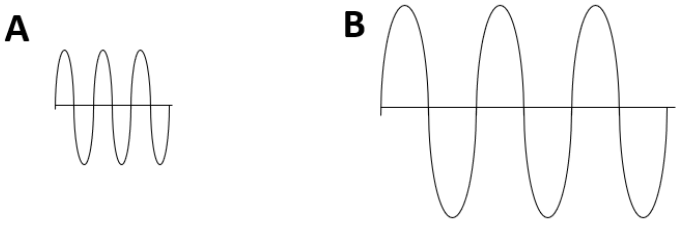
Lowest pitch?



Loudest sound?



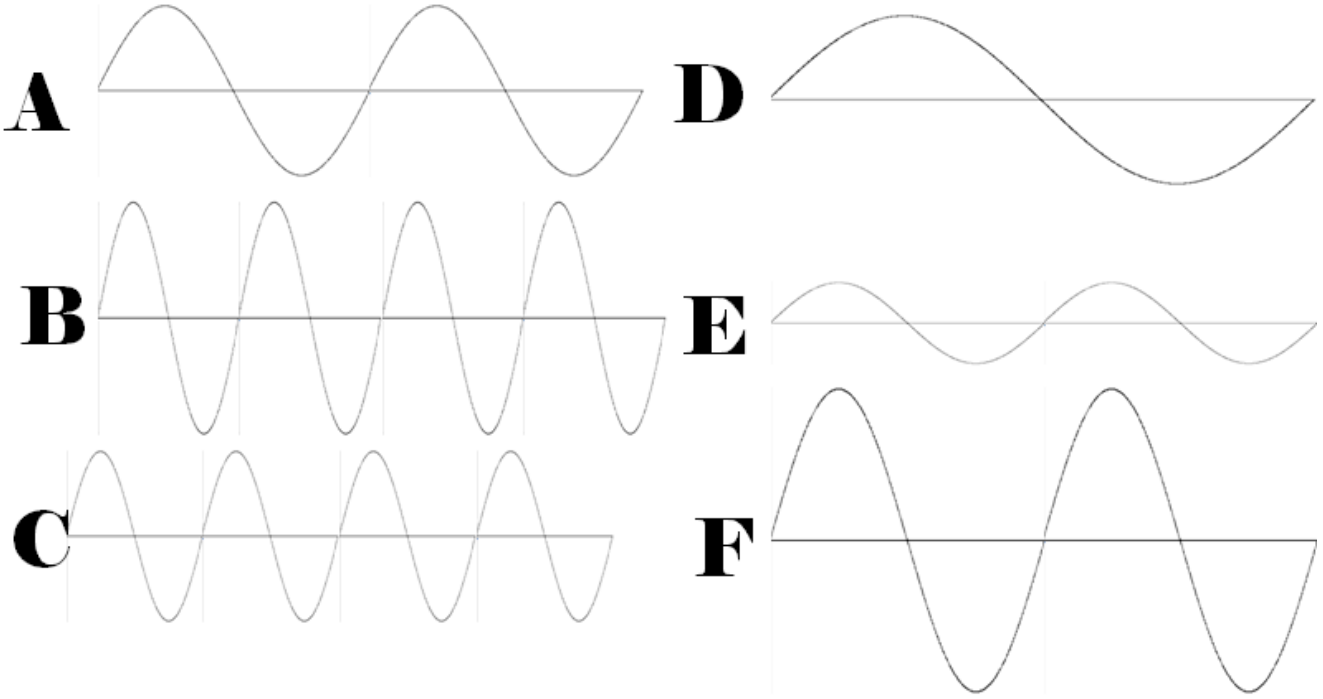
Highest pitch?



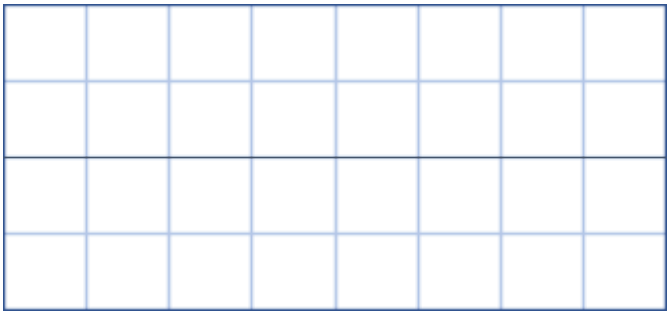
The class next door is being extremely noisy. Describe how we are able to hear the noise.

9Ps.01 Draw and interpret waveforms, and recognise the link between loudness and amplitude, pitch and frequency.

Frequency and Pitch

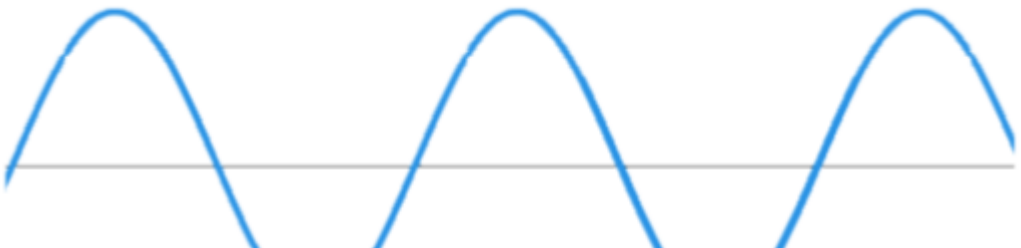


5. Which sound has a higher pitch than A, but is at the same volume?
6. How would sound D sound compared to A?
7. How would sound F sound compared to A?
8. In the grid below draw a sound wave with a higher pitch, but lower volume than A.



Sound Quiz

1. Label the following wave: (2.5)



2. State what piece of equipment converts this sound into an electrical wave? (1)

……
……..

3. State the approximate speed of: (4)

a) Sound through solids:

b) Sound through liquids:

c) Sound through gases:

d) Light:

4. Explain why sound travels at different speeds depending of the state of matter (solid, liquid or gas). (2)

……

……..

……

……..

5. Describe how sound travels to the brain for interpretation (3)

……

……..

……

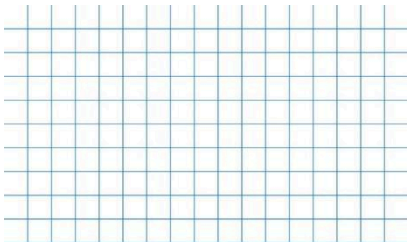
……..

……

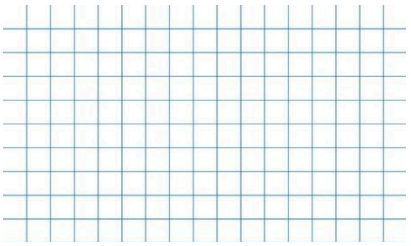
……..

6. Draw a wave with the following sound attributes: (4)

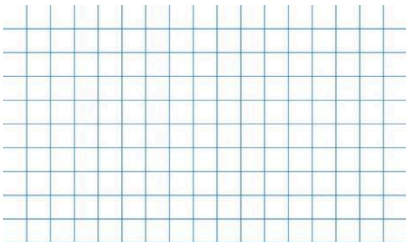
a. Loud and High Pitch



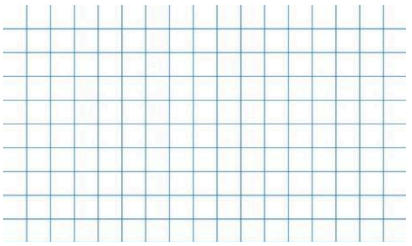
b. Quiet and High Pitch



c. Low amplitude and low pitch

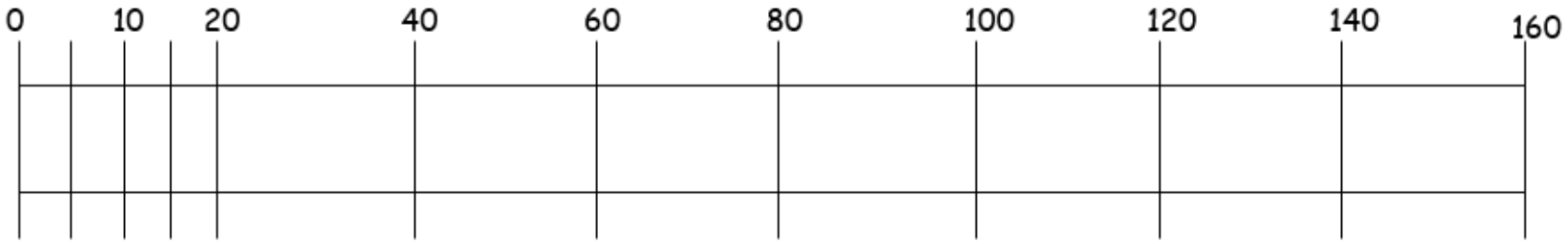


d. Loud and low frequency



The Hearing Ranges of some Animals

(Frequency measured in kHz. 1000Hz = 1kHz)



Elephant 5Hz – 10kHz Range= ……..Hz

Human 10Hz – 20kHz Range= ……..Hz

Dog 20Hz – 30kHz Range= ……..Hz

Tiger 30Hz – 50kHz Range= ……..Hz

Dolphin 40Hz – 110kHz Range= ……..Hz

Bat 20Hz – 160kHz Range= ……..Hz

Fill in the missing ranges **in Hz** then answer these questions:

1) Which animal can hear the lowest pitch sounds?
2) Which animal can hear the highest pitch sounds?
3) What frequency range do dog whistles lie in? How did you work this out?
4) Which animal has the longest hearing range?
5) Why do animals have different hearing ranges?

Glue Leaflet Here

Electrical Quantities

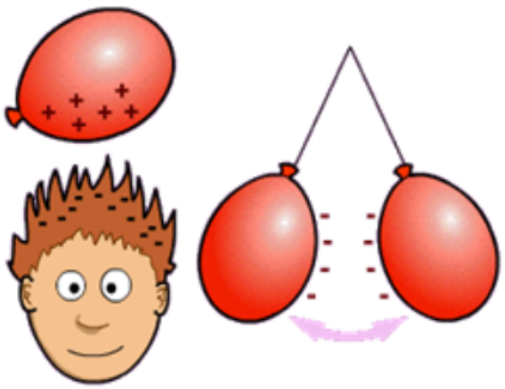
A	B	C	D	E	F	G	H	I	J	K	L	M
20	4	13	26	3	25	1	5	16	12	11	14	10

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
18	17	9	21	8	7	22	19	2	23	15	6	24

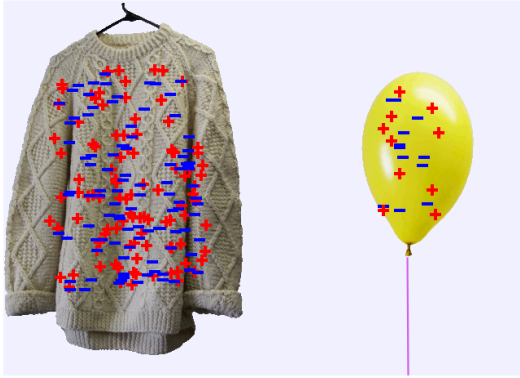
__ __ __ __ __ __ __ __ __ __
22 17 26 20 6 23 3 20 8 3

__ __ __ __ __ __ __ __ __ __ __
1 17 16 18 1 22 17 14 3 20 8 18

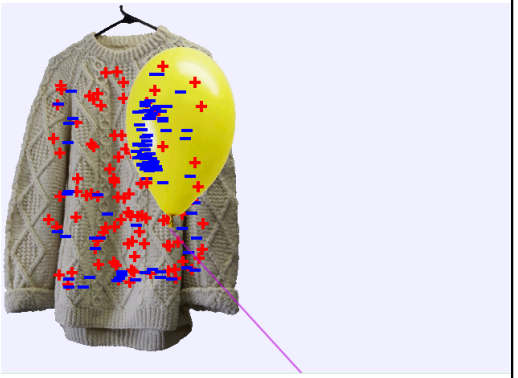
__ __ __ __ __ __ __ __ __ __ __ __ __ __ __ .
20 4 17 19 22 3 14 3 13 22 8 16 13 16 22 6



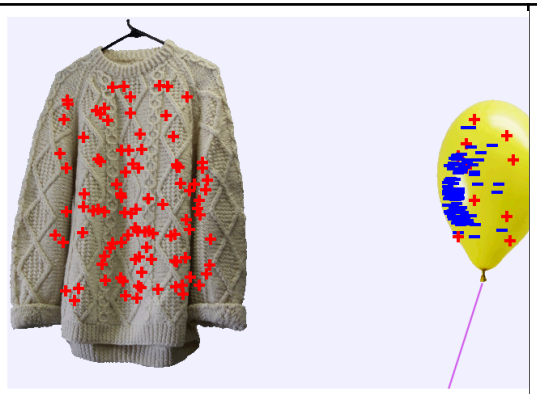
1. What is the initial charge of the jumper?
2. What is the initial charge of the balloon?



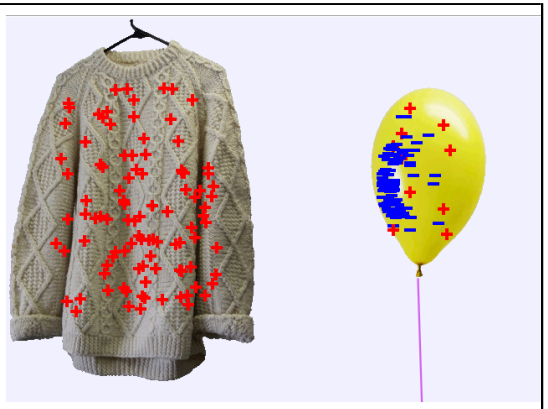
3. What happens to the charges when you rub the balloon on the jumper?
4. Why does the balloon stick to the jumper?



5. What happens to the charges when you place the balloon on the wall?



6. What if you release the balloon right in the centre?



Switch	**Cell**	**Battery**
Lamp / Bulb	**Voltmeter**	**Ammeter**
Fixed Resistor	**Variable resistor**	**Motor**

9Pe.04 Use diagrams and conventional symbols to represent, make and compare circuits that include cells, switches, resistors (fixed and variable), ammeters, voltmeters, lamps and buzzers.

9TWSm.02 Describe some important models, including analogies, and discuss their strengths and limitations.

Modelling Electricity

9Pe.02 Know how to measure current and voltage in series and parallel circuits, and describe the effect of adding cells and lamps.

Series Circuits – Current

- **The current is the amount of charge passing a point in a circuit every second**

(It is helpful to think of current as the **charge per second**)

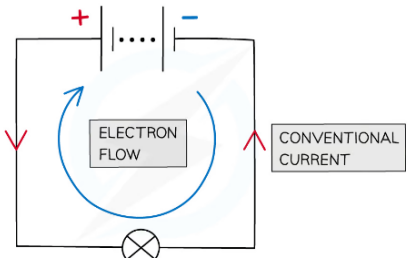
- Charge, current and time are related by the following equation:

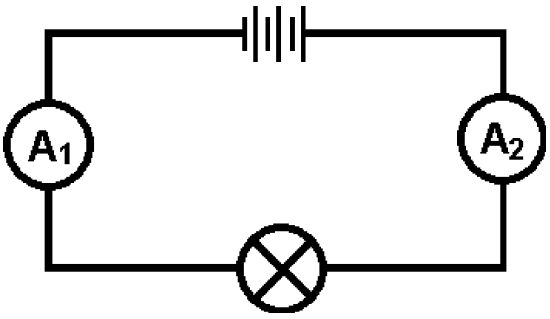
$$\text{CHARGE} = \text{CURRENT} \times \text{TIME}$$

$$Q = I \times t$$

- Where the symbols:
  - ***Q* stands for charge (measured in coulombs, C)**
  - ***I* stands for current (measured in amps, A)**

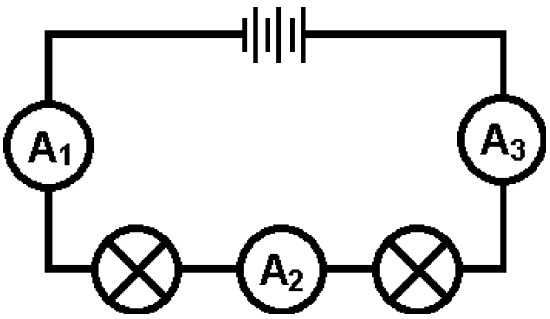
- This flow of charge is called an **electric current**
  - The greater the flow of charge, the greater the electric current





A_1 = _____ Amps

A_2 = _____ Amps

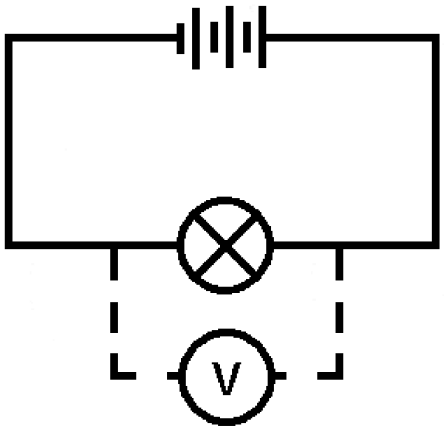


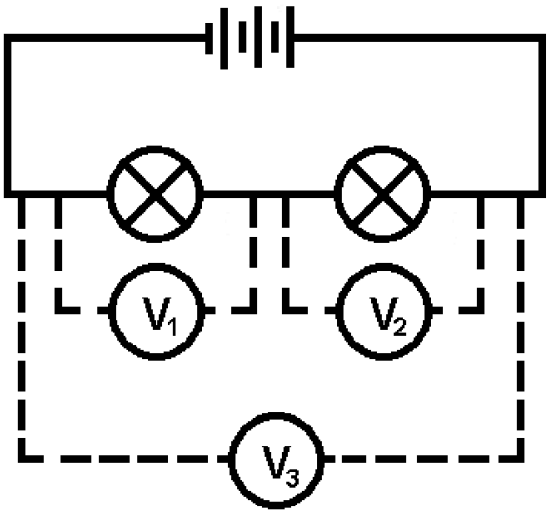
A_1 = _____ Amps

A_2 = _____ Amps

A_3 = _____ Amps

What have you found out about the current in a series circuit?





V_1 = _____ Volts

V_2 = _____ Volts

V_3 = _____ Volts

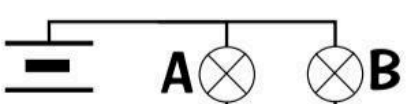
What have you found out about the voltage in a series circuit?

Series and Parallel Circuits

Q1 Look at the circuit below. The **ammeter** in this circuit reads 2 A.

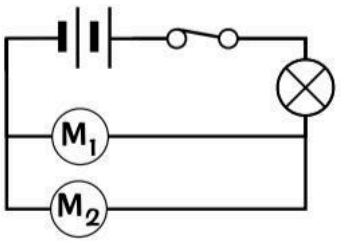
Series and Parallel Circuits

Q3 This circuit has **five** bulbs (A, B, C, D and E). For each change to the circuit listed below, show which bulbs would be **on** and which would be **off** by writing the correct letters in the table.



Series and Parallel Circuits

Q5 This circuit diagram shows a circuit containing **two motors** and a **bulb**. Say which of the following statements are **true (T)** or **false (F)** by circling the appropriate letter.



a) The lamp and the switch are connected in parallel. (**T** / **F**)

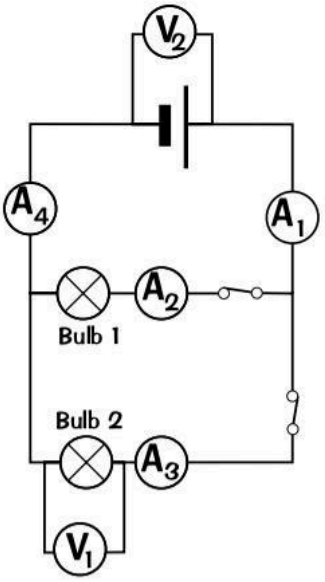
b) The electric current is the same everywhere in the circuit. (**T** / **F**)

c) The potential difference across each motor is the same. (**T** / **F**)

d) If motor 1 has a higher resistance than motor 2, its current will be lower. (**T** / **F**)

e) If the switch is open, current will still flow through motor 1. (**T** / **F**)

Q6 The diagram shows the circuit that powers two lights in a garage. In this circuit, ammeter A_1 reads **10 A** and ammeter A_2 reads **1 A**.



a) Work out the **readings** for the other two ammeters.

Ammeter A_3: .....

Ammeter A_4: .....

b) Describe how **current** flows around the circuit, starting at the cell. Ignore voltmeters V_1 and V_2.

.....

.....

.....

.....

.....

c) Why is using this circuit more sensible than wiring the garage lights in **series**?

.....

.....

d) The potential difference of the cell is **1.5 V**. Write down the reading on each **voltmeter**.

Voltmeter V_1: ..... Voltmeter V_2: .....

Q1 **a)** Series because e.g. the current has no choice of route.

b) i) 2 A, because current is the same everywhere in the circuit.

ii) 0 A, because the open switch stops current flowing in the entire circuit.

c) 2 A

Q2 A — same
B — dimmer
C — brighter

Q3

Change to original circuit	Bulb(s) on	Bulb(s) off
Bulb A is unscrewed	B, D, E	A, C
Bulb D is unscrewed	A, C, E	B, D
Bulb E is unscrewed		A, B, C, D, E

Q4 **a)** No

b) Yes

c) Yes

d) Yes

e) Bigger. The potential difference of the cell is shared between all the components in a series circuit. There are now less components in the circuit so the potential difference across bulb 1 must be bigger.

Q5 **a)** F

b) F

c) T

d) T

e) F

Q6 **a)** Ammeter A_3: 9 A
Ammeter A_4: 10 A

b) The current flows out of the cell, and it all flows through ammeter A_1. Then it splits into two routes. Some of the current flows through ammeter A_2 and bulb 1. Some of the current flows through the switch, ammeter A_3 and bulb 2. Then the two currents join up again and flow through ammeter A_4 and back to the cell.

c) If one bulb blows, the other bulb will stay lit. If they were wired in series, then if one bulb were to blow they would both go out.

d) Both will be 1.5 V.

resistance = $\frac{\text{potential difference}}{\text{current}}$

$R = \frac{V}{I}$ Units: R is measured in ohms (Ω)
V is measured in volts (V)
I is measured in amperes (A)

1. Solve for the unknown measurement.

a) I = 10 A R = 1500 Ω V = ?	b) I = ? R = 200 Ω V = 240 V	c) I = 15 A R = ? V = 110 V

2. Find the unknown quantity (CONVERT to the base unit FIRST, then solve).

a) I = ? R = 20 Ω V = 350 mV = _____ V	b) R = ? I = 25 mA = _____ A V = 110 V	c) I = 15 A R = 7333 mΩ = _____ Ω V = ?

Complete the following questions using the equation: V = I x R or **R = V ÷ I** or **I = V ÷ R**

6. What is the potential difference across an electrical load that has a resistance of 4 Ω and a current of 3 A flowing through it?

7. Calculate the current an electric clothes dryer draws when it is connected to a 230 V source ands has a resistance of 9.2 Ω.

8. What is the resistance in a circuit if a potential difference of 110 V causes a current of 10 A?

9. What is the potential difference across a hand-held fan that has a resistance of 120 Ω and a current of 50 mA flowing through it?

10. An electric toaster has a resistance of 12 Ω. What current will it draw from a 120 V supply?

11. a) A portable radio connected to a 9.0 V battery draws a current of 25 A. What is the resistance of the radio?

b) What type of energy is the electrical energy from the battery being converted into in this device?

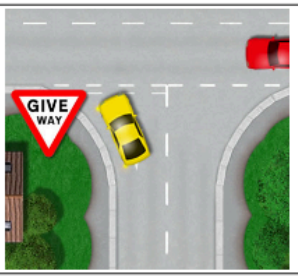
12. A heating coil offers a resistance of 2.5 kΩ. What potential difference is required so that 1.5 A of current pass through it?

13. How much resistance does a heavy duty flashlight have if it has a current of 25 mA flowing through it and is being powered by four 1.5 V cells?

Homework

Switch	**Cell**	**Battery**
Lamp / Bulb	**Voltmeter**	**Ammeter**
Fixed Resistor	**Variable resistor**	**Motor**

9Pe.01 Describe how current divides in parallel circuits.

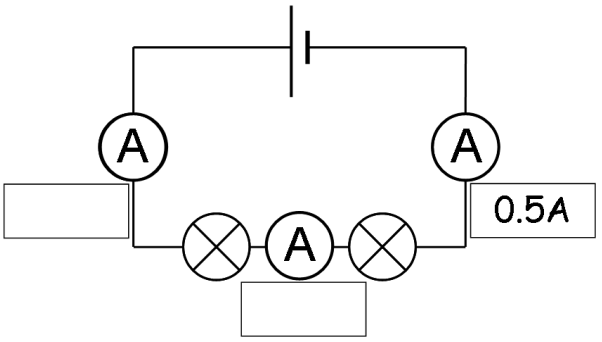
	Series	Parallel
Current, I (Amps)	SAME	
P.d., V (Volts)	shared	

Circuit 1:

What type of circuit is it?

What is being measured?

How is it being measured?



What is the rule?

Therefore,

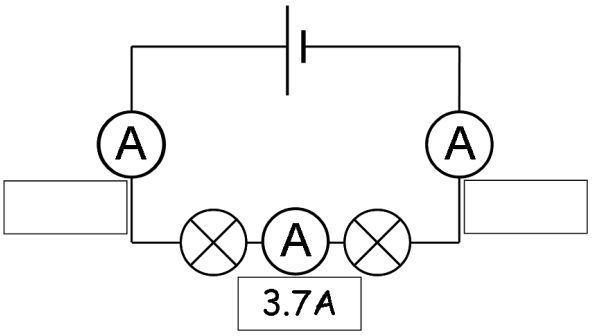
A =

A =

A =

Circuit 2:

What type of circuit is it?



What is being measured?

How is it being measured?

What is the rule?

Therefore,

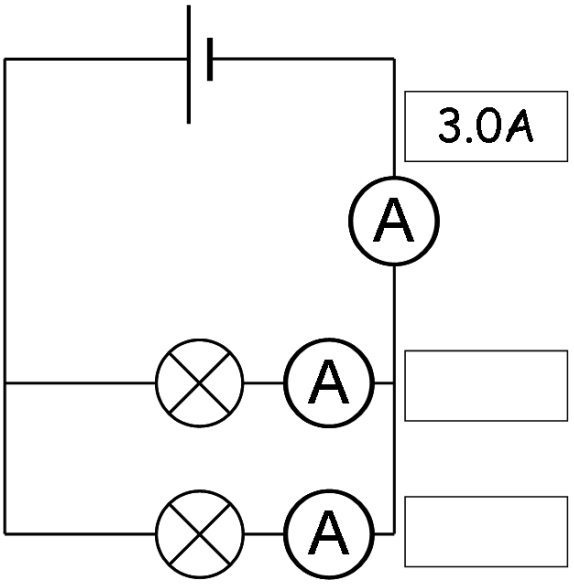
A =

A =

A =

Circuit 3:

What type of circuit is it?



What is being measured?

How is it being measured?

What is the rule?

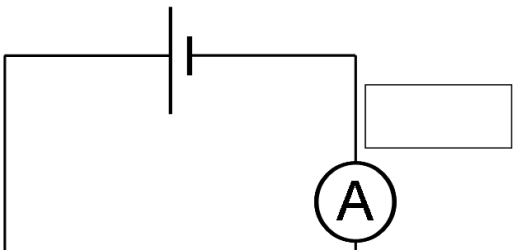
Therefore,

A =

A =

A =

Circuit 4:



What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?

Therefore,

A =

A =

A =

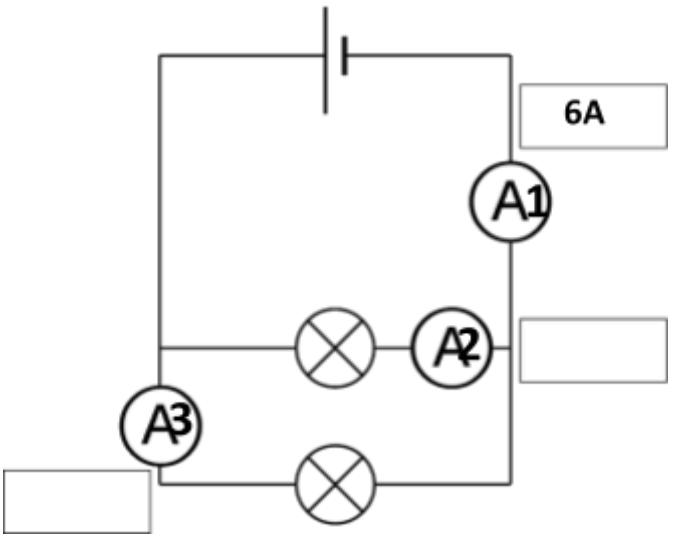
Circuit 5:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

A1 =

A2 =

A3 =

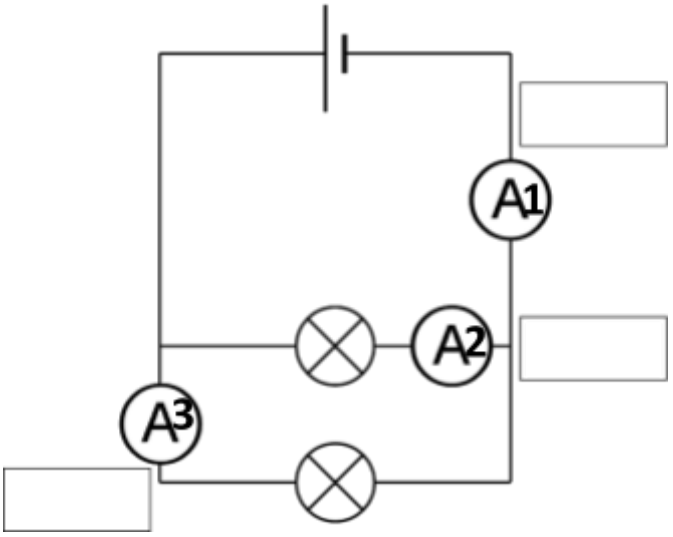
Circuit 6:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

A1 =

A2 =

A3 =

Circuit 7:

What type of circuit is it?

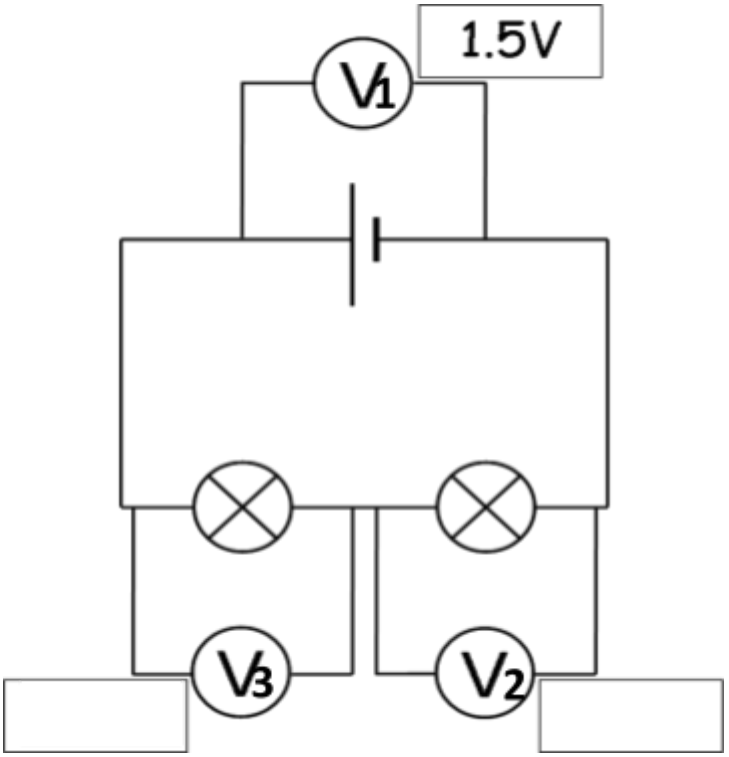
What is being measured?

How is it being measured?

What is the rule?

Therefore,

V1 =



V2 =

V3 =

Circuit 8:

What type of circuit is it?

What is being measured?

How is it being measured?

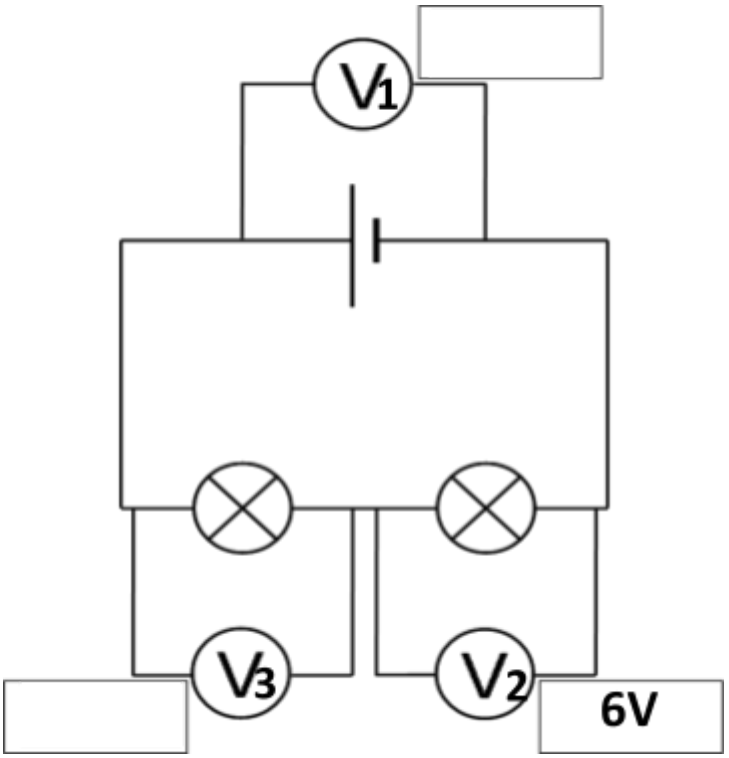
What is the rule?

Therefore,

V1 =

V2 =

V3 =



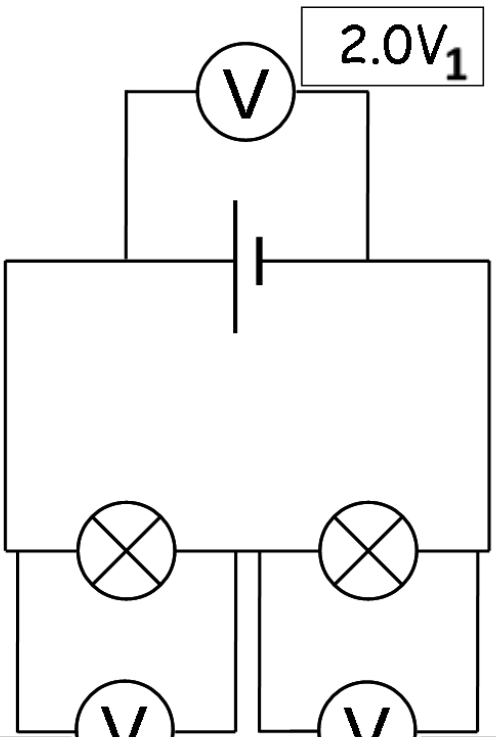
Circuit 9:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

3 **2**

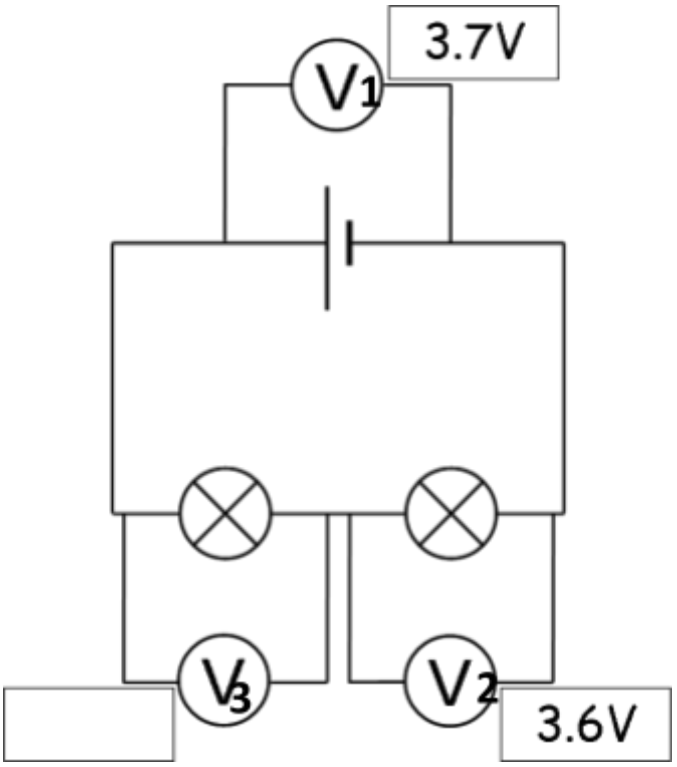
Circuit 10:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

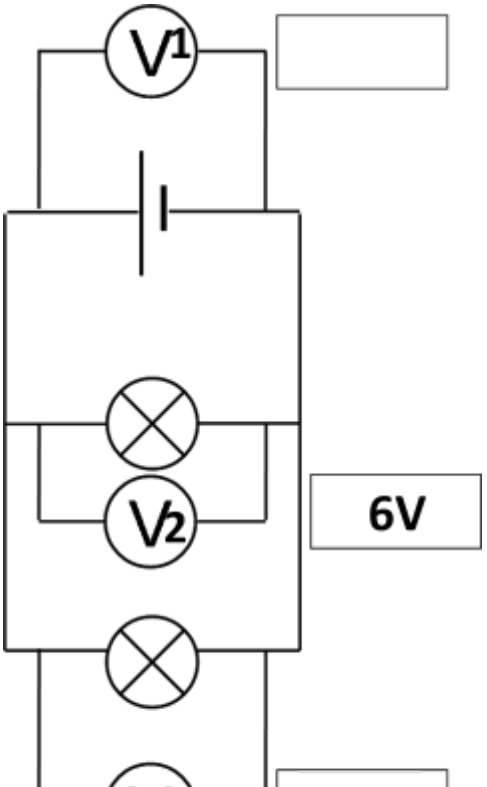
Circuit 11:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

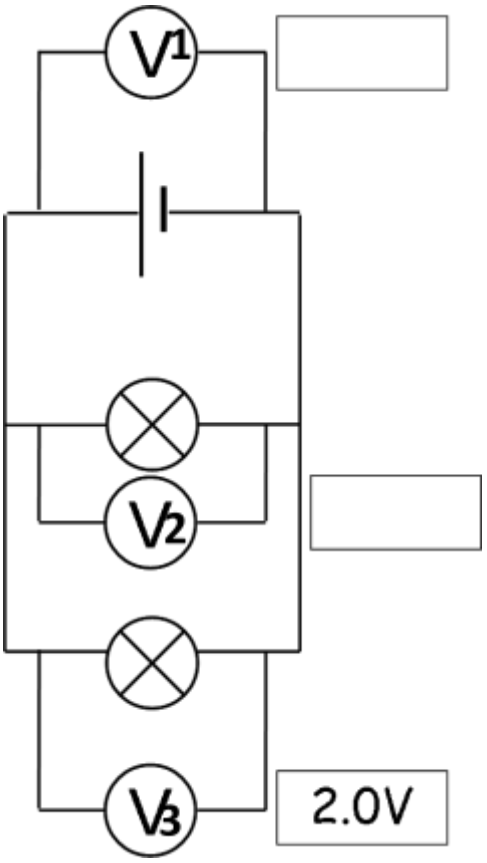
Circuit 12:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

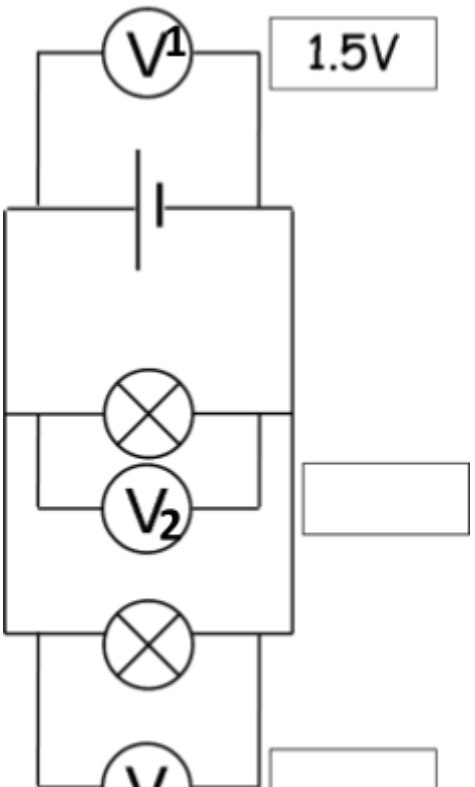
Circuit 13:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

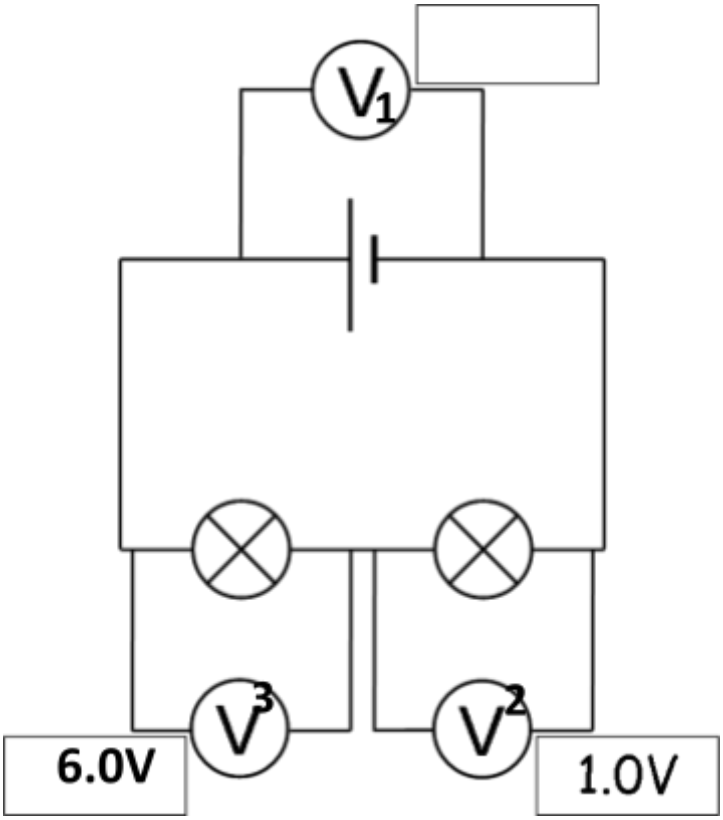
Circuit 14:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

V2 =

V3 =

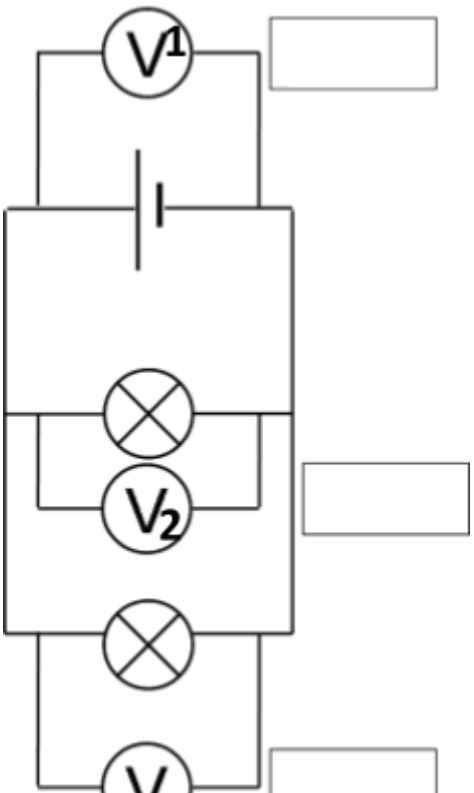
Circuit 15:

What type of circuit is it?

What is being measured?

How is it being measured?

What is the rule?



Therefore,

V1 =

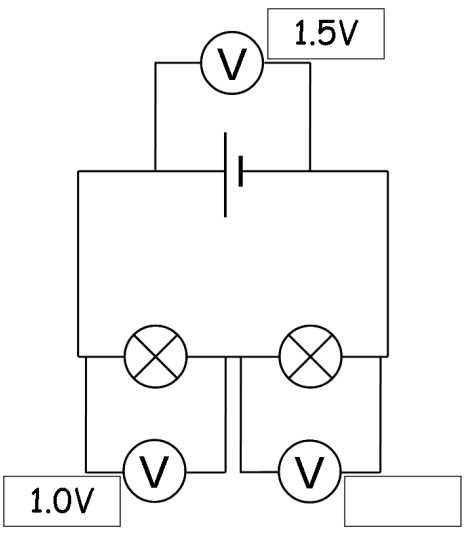
V2 =

V3 =

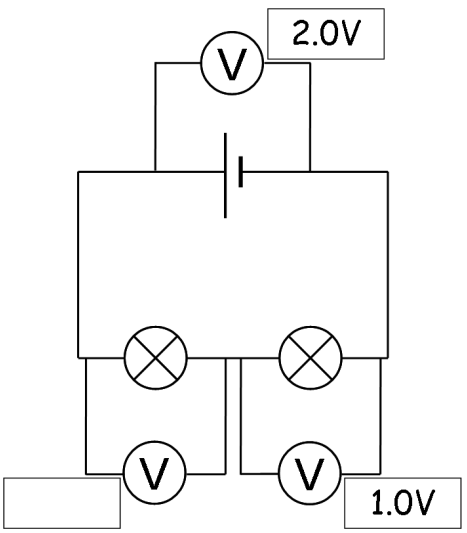
Series circuits – currents and voltages

Fill in the boxes. Some diagrams have more than one box to fill in.

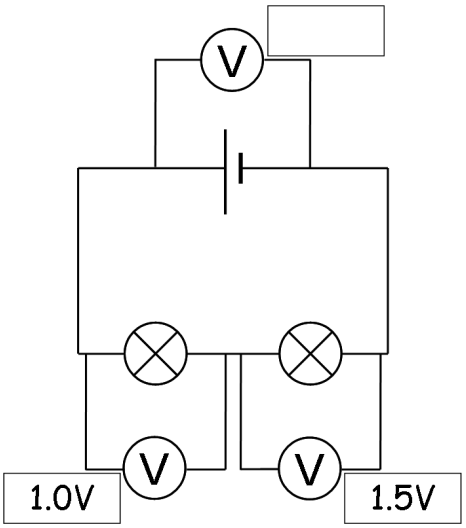
1.



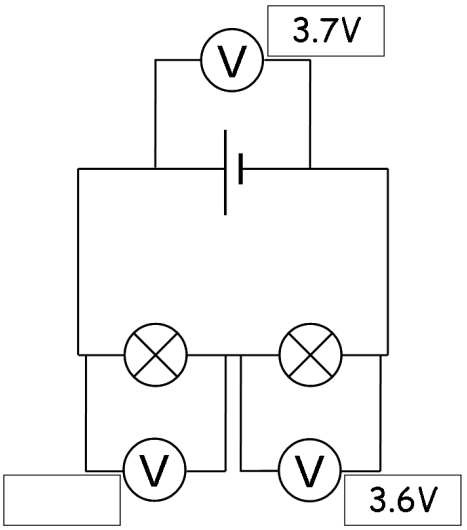
2.



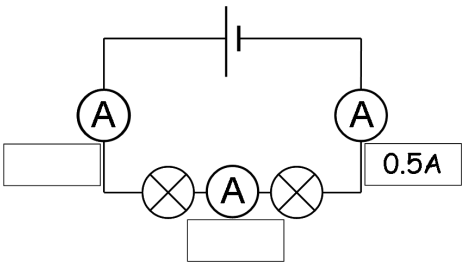
3.



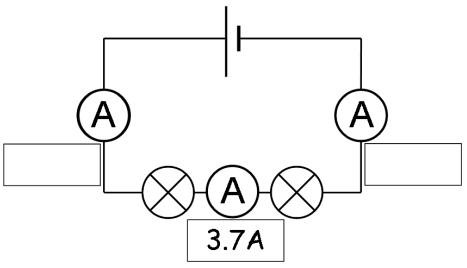
4.



5.

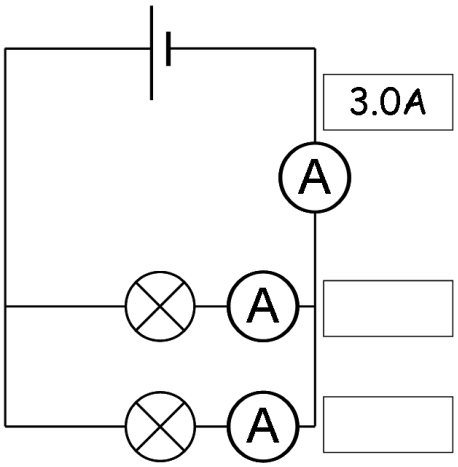


6.

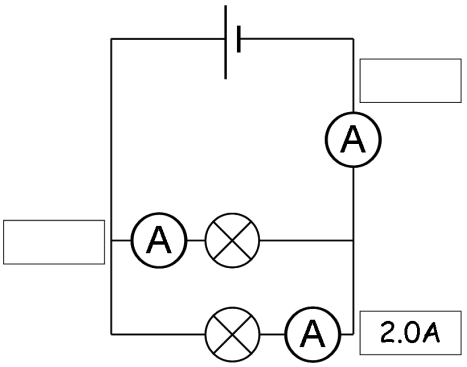


Parallel circuits – currents and voltages

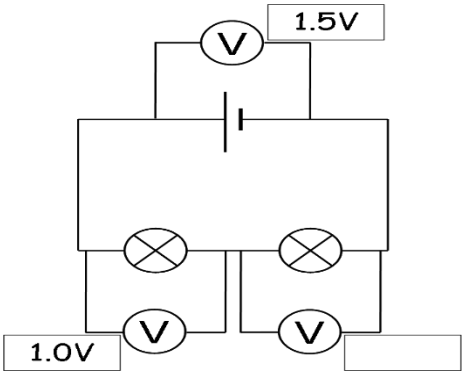
7.



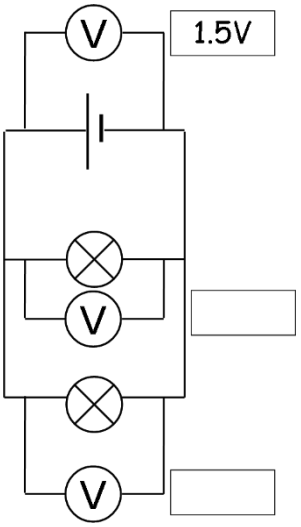
8.



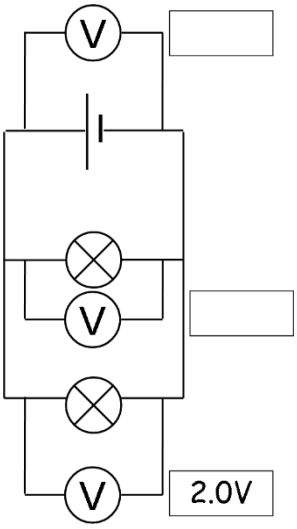
9.



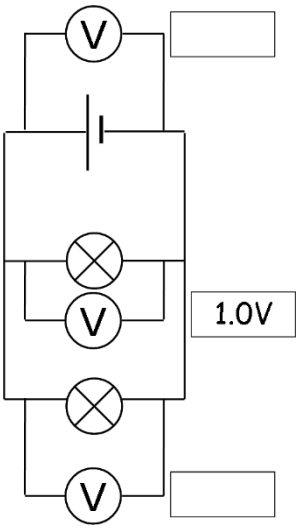
10.



11.

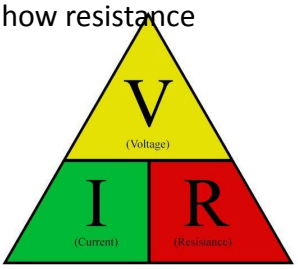


12.



9Pe.03 Calculate resistance (resistance = voltage / current) and describe how resistance affects current.

Calculating Resistance



1. A 3 A current flows through a 240 V lamp. What is the resistance of the lamp?

Step	**Working**
Equation	
Substitution	
Calculation and Units	

2. 16 A flows through a 320 V lamp. What is the resistance of the lamp?

Step	**Working**
Equation	
Substitution	
Calculation and Units	

3. 8 A flows through a 64 V lamp. What is the resistance of the lamp?

4. 25 A flows through a 505 V lamp. What is the resistance of the lamp?

5. A 300V lamp has a resistance of 6 Ω. What is the current?

6. A 420V lamp has a resistance of 0.7 Ω. What is the current?

7. A 12.4V lamp has a resistance of 0.2 Ω. What is the current?

8. A 12 A current flows through a 4 Ω resistor. What is the voltage?

9. A 21 A current flows through a 3.5 Ω resistor. What is the voltage?

10. A 0.8 A current flows through a 0.8 Ω resistor. What is the voltage?

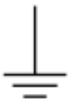
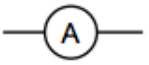
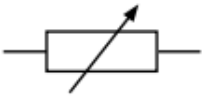
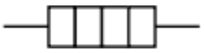
11. A 0.4 A current flows through a 4 Ω resistor. What is the voltage?

12. A 1249 mV lamp has a resistance of 0.2 Ω. What is the current?

13. 0.05 A flows through a 1200 mV lamp. What is the resistance of the lamp?

Fuse Homework Due:

1. Find 5 different images/scenarios with electrical hazards including: damaged insulation, overheating cables and damp conditions.
2. State what a fuse is and what it does.
3. Explain how fuses work and what different fuses there are and why there are different fuse ratings.

Core			
cell		switch	
battery of cells	 or 	earth or ground	
power supply		ammeter	
a.c. power supply		voltmeter	
junction of conductors		fuse	
lamp		variable resistor	
fixed resistor		electric bell	
heater		motor	

9ESp.02 Explain why the jigsaw appearance of continental coasts, location of volcanoes and earthquakes, fossil record and alignment of magnetic materials in the Earth's crust are all evidence for tectonic plates.

True or False

1. tectonic plates are formed of crust only
2. all of the mantle can flow
3. the mantle flows like water
4. continents cannot move
5. the Earth has remained the same over time
6. continents move quickly
7. continents are the same as tectonic plates
8. volcanoes and earthquakes can only happen at plate boundaries.

Fossil Evidence - There are many examples of fossils found on separate continents and nowhere else, suggesting the continents were once joined. If Continental Drift had not occurred, the alternative explanations would be:

- The species evolved independently on separate continents – contradicting Darwin's theory of evolution.

- They swam to the other continent/s in breeding pairs to establish a second population.

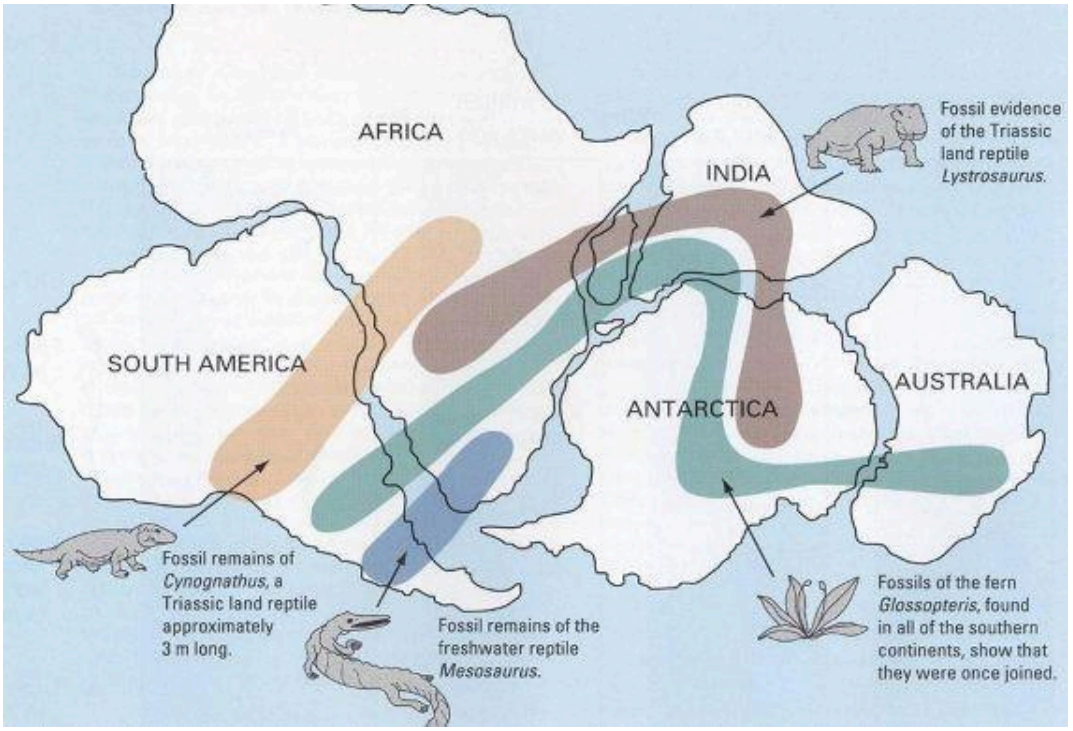


Image: From This Dynamic Earth: The Story of Plate Tectonics p8

Remains of Mesosaurus, a freshwater crocodile-like reptile that lived during the early Permian (between 286 and 258 million years ago), are found solely in Southern Africa and Eastern South America. It would have been physiologically impossible for Mesosaurus to swim between the continents. This suggests that South America and Africa were joined during the Early Permian.

Cynognathus is an extinct mammal-like reptile. The name literally means ‘dog jaw’. Cynognathus was as large as a modern wolf and lived during the early to mid Triassic period (250 to 240 million years ago). It is found as fossils only in South Africa and South America.

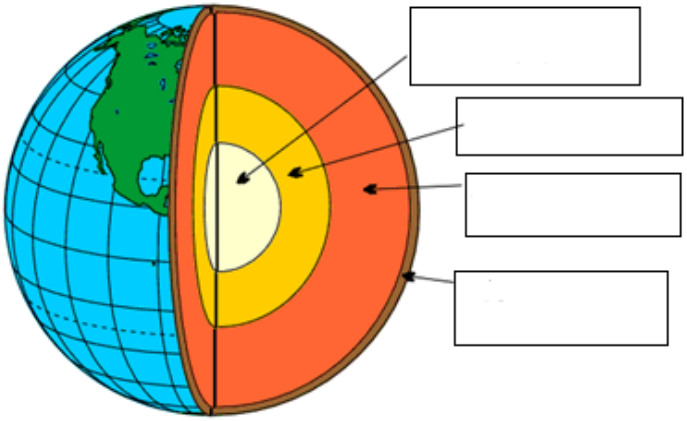
Lystrosaurus

Lystrosaurus - which literally means ‘shovel reptile’ - was dominant on land in the early Triassic, 250 million years ago. It is thought to have been herbivorous and grew to approximately one metre in length, with a stocky build like a pig. Fossils of Lystrosaurus are only found in Antarctica, India and South Africa.

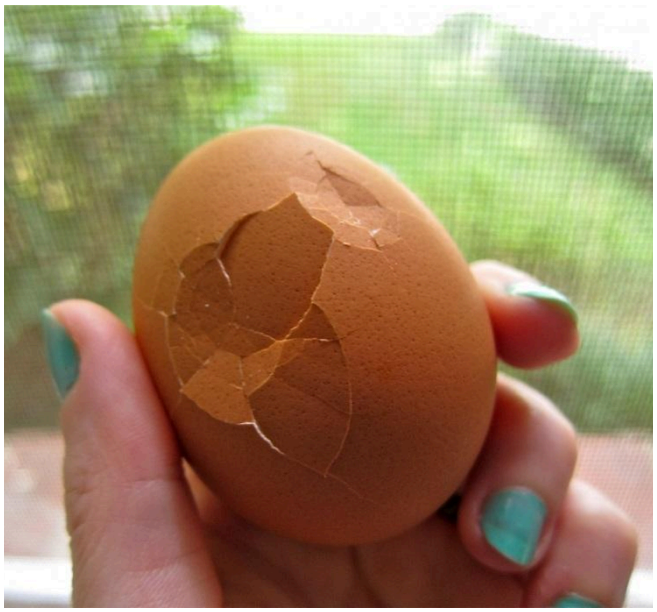
Glossopteris was a woody, seed-bearing shrub or tree, named after the Greek descripton of ‘tongue’ – a description of the shape of the leaves. Some reached 30m tall. It evolved during the Early Permian (299 million years ago) and went on to become the dominant species throughout the period, not becoming extinct until the end of the Permian. Fossils are found in Australia, South Africa,South America, India and Antarctica.

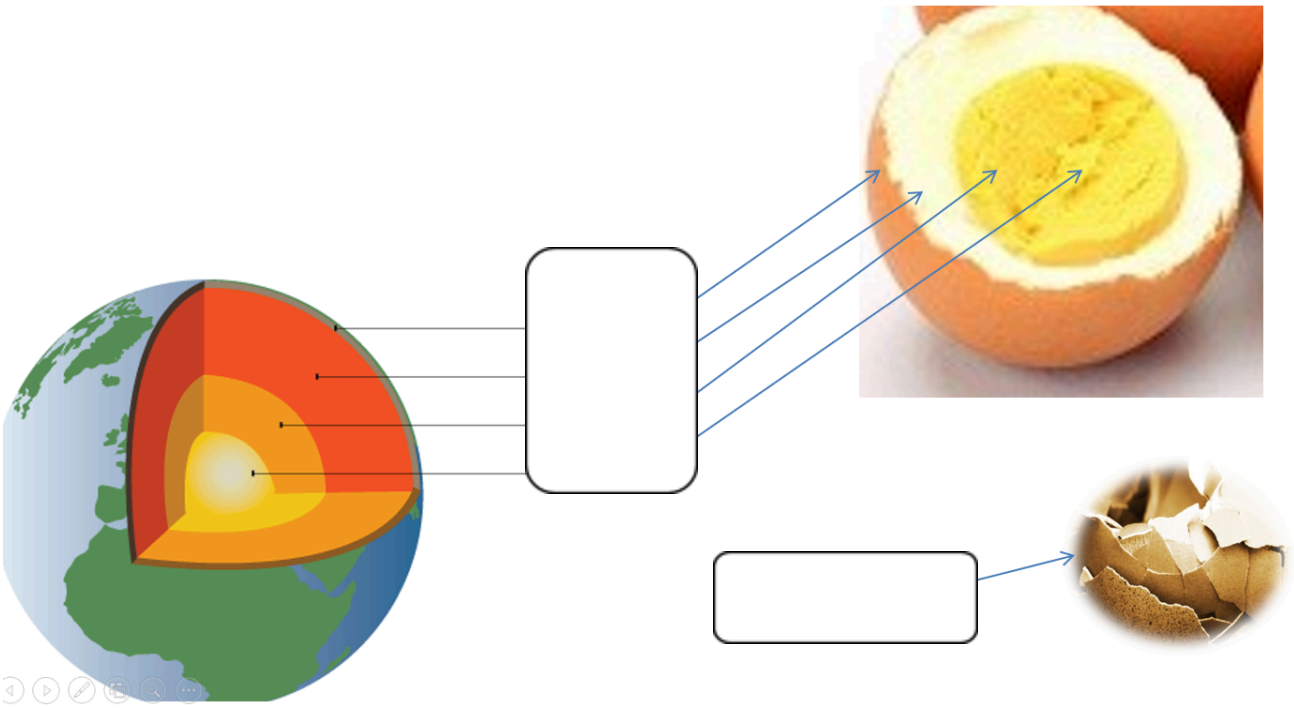
When the continents of the southern hemisphere are re-assembled into the single land mass of Gondwanaland, the distribution of these four fossil types form linear and continuous patterns of distribution across continental boundaries.

Structure of the Earth

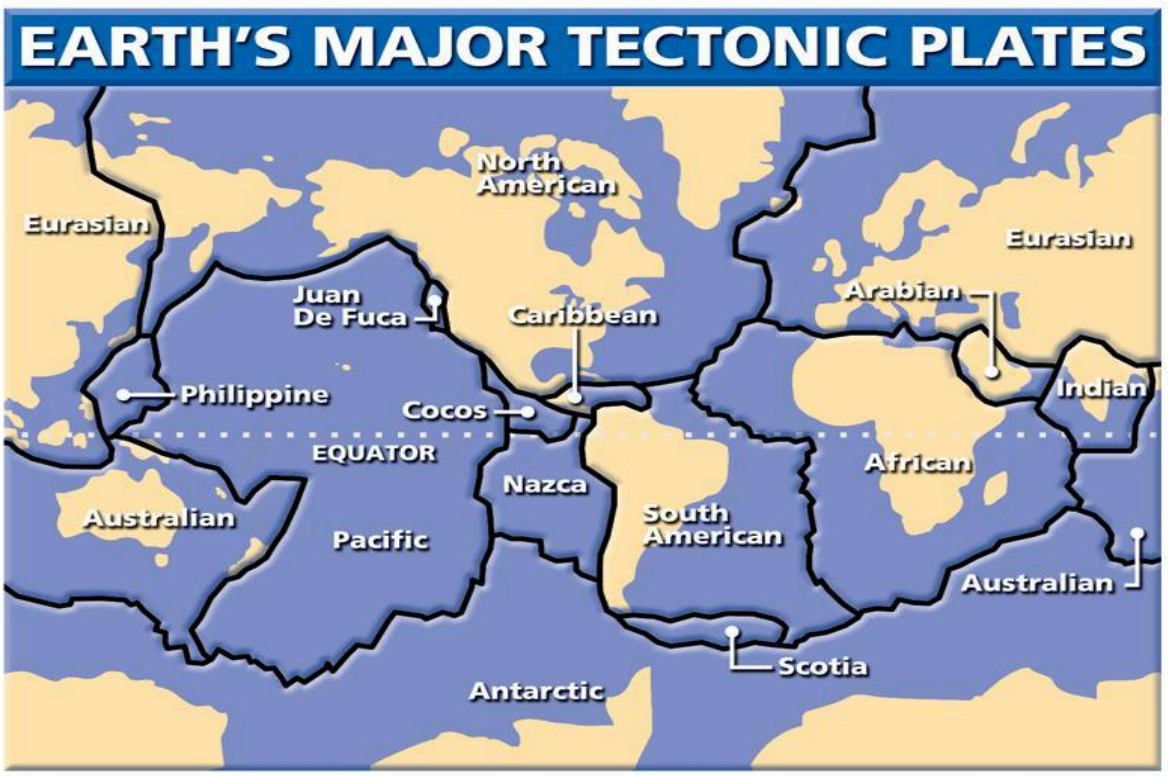


Label the diagram: Mantle, Inner Core, Outer Core, Crust.

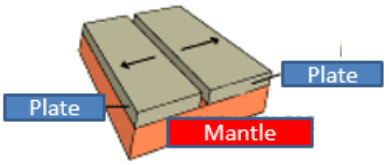
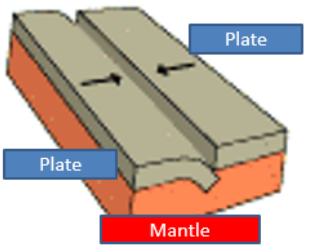
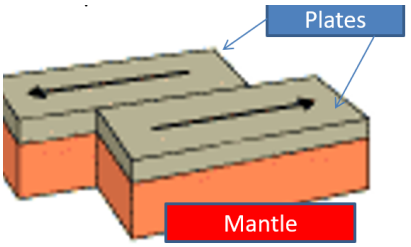




9ESp.01 Explain the movement of tectonic plates in terms of convection currents.



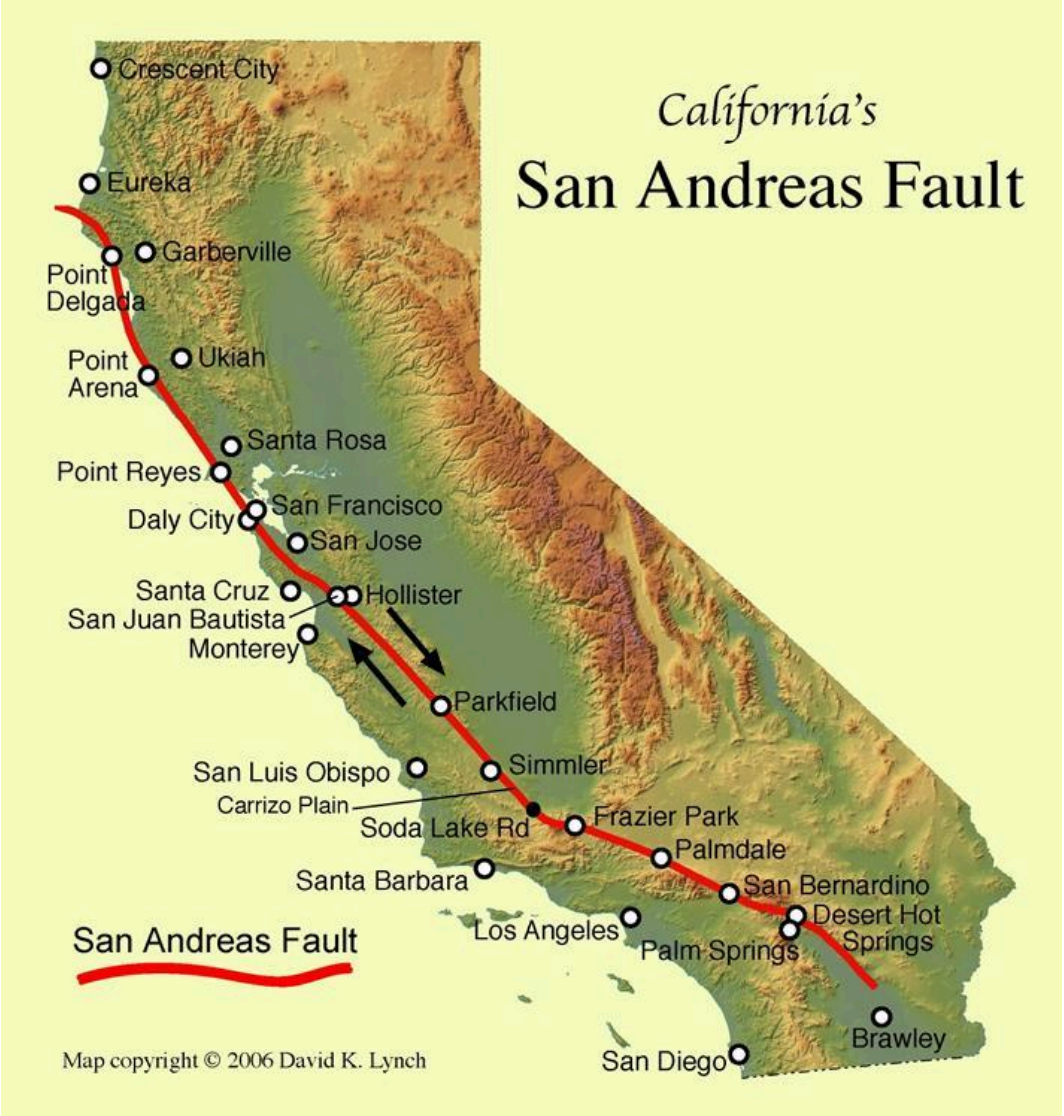
- The Earth's surface is made up of large _____ (like pieces of a jigsaw).
- These plates are constantly travelling at a few _____ per year.
- The ocean floors are _____ from the centre and sinking at the edges.
- _____ currents beneath the plates move the plates in different directions.

Destructive Plate Boundary		**Two plates slide past each other, without creating or destroying any land.**		
Conservative Plate Boundary		**Two plates move away from each other.**		
Constructive Plate Boundary		**two plates push against each other causing violent earthquakes, volcanoes and mountain ranges to be formed.**		

1. Draw and label the 3 types of plate boundaries.

2. Show the direction of movement at each type of plate boundary.

3. Describe the types of land formation and natural disasters that can occur at each plate boundary.



1. Draw a cross section of the earth using different sized circles for each layer.
2. Label each layer using the correct term
3. Use a different colour to shade each layer of the Earth's structure.
4. Explain why the structure of the earth is similar to an egg.

https://www.microblife.in/what-evidence-exists-to-support-the-existence-of-pangea/

- What Evidence Exists To Support The Existence Of Pangea??
- What is the evidence of Pangea?
- What are 4 evidences that support the theory of Pangea?
- What is the best evidence for Pangea?
- What evidence exists to support the existence of Pangea quizlet?
- What are 5 pieces of evidence that support continental drift?
- What are 6 pieces of evidence that support continental drift?
- What evidence supports the idea that all the continents were once joined together?
- What types of evidence best supports the theory of plate tectonics?
- Which of the following is the best evidence that Earth's continents?
- What are three pieces of evidence that support the theory of plate tectonics and Pangea?
- What does evidence of glaciers tell us about Pangaea?
- What was never proposed as evidence supporting the existence of Pangaea?
- What two pieces of evidence did Wegener discover that supported the idea of Pangaea quizlet?
- What evidence supports the theory of continental drift quizlet?
- What was the first evidence of continental drift?
- How do scientists know about Pangea?
- What is the evidence for continental drift and plate tectonics?
- Which two pieces of fossil evidence supports the idea of continental drift?
- What proved continental drift?
- What evidence supports the idea that all the continents were once joined together?
- What fossil evidence supports the belief that all of these continents were once joined and known as Pangea?
- What are the evidence gathered by Alfred?
- Is there a possibility that Pangea can happen again?
- What did Wegener find that he believed was evidence to support his theory?
- How do rocks help support the theory of plate tectonics?
- Which evidence best supports the claim that plate tectonics cause earthquakes Quizizz?
- What evidence exists that the earth was once one massive landmass is called Pangaea?
- What evidence in rocks supports the theory of seafloor spreading?
- What is glacier evidence?
- What evidence do glaciers provide for past movement of the continents?
- How does glacial evidence support continental drift?
- What evidence indicated scientists that the continents were once connected?
- What evidence did the Deep Sea Drilling Project find about the dates of rocks in the ocean basins?
- How Do We Know Pangea Existed?
- How Do We Know Plate Tectonics Is Real?
- What is Pangaea? What is the evidence that pangea existed
- What Did Pangaea Look like?

9ESs.03 Know that nebulae are clouds of dust and gas and can act as stellar nurseries.
Nebula, nebulae, nebular, star, stellar, gravity, gravitational collapse, supernova, supernovae, hydrogen, helium, protostar, fusion, interstellar space

Use the 2 videos on 9.9 Earth and Beyond to complete the following task.

Create a children's picture book to:

1. Describe how the Moon formed
2. List evidence for the collion theory for the formation of the moon
3. State what a nebula is
4. Give examples of different nebulae
5. Describe how nebulae form
6. Explain how stars are formed
7. Challenge: State the different stages of a star
8. Challenge: Draw and label the phases of the moon

9ESs.02 Describe the evidence for the collision theory for the formation of the Moon.
https://www.nasa.gov/feature/ames/lunar-origins-simulations