

Y8 Science Homework Booklet

Name:

Class:

Teacher:

[illegible]

Section 1: Review of prior knowledge

1. What is the function of the nucleus?

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2. Draw and label a typical plant cell

3. Define solute

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4. What type of salt does hydrochloric acid produce?

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5. Describe how static electricity is generated

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6. State the equation for calculating speed

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Section 2: Refreshing current knowledge

1) State the seven nutrients your body requires to function properly

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2) Name one food that is high in each nutrient

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3) What disease can you get if you don't have enough vitamin C?

4) How can we test for glucose? Describe how to perform this test

Section 3: Application of knowledge

1) The table below shows what four people ate for lunch.

name	lunch
Jon	chicken and salad
Nadia	cheeseburger and chips
Clare	lemonade and a jam doughnut
Zak	mushroom soup and an orange

(i) Whose lunch had the most sugar in it?

(ii) Whose lunch had the most fat in it?

(iii) Eating too much fat is bad for you.
Give **one** reason for this.

Section 1: Review of prior knowledge

1. What is an insulator?

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2. What is a unicellular organism?

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3. What is digestion?

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4. Suggest a material that is a good conductor of thermal energy

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5. State the sex cells in humans

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6. How do molecules move through cytoplasm?

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Section 2: Refreshing current knowledge

1) What happens if we eat food too much energy in than what we expend?

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2) What happens if we do not consume enough calories?

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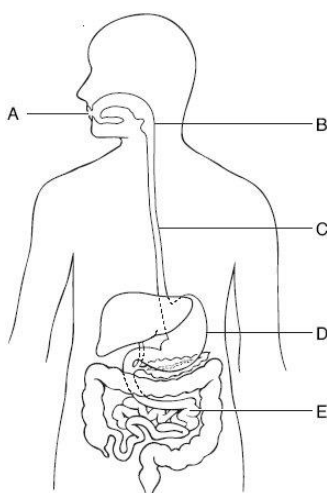
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3) A typical man needs 2500kcal per day; A typical woman needs 2000kcal per day. A Big Mac has 250 calories. How many Big Macs could you eat if that's all you ate today?

4) What diseases are you more likely to get if you are overweight or obese?

Section 3: Application of knowledge

1) The diagram below shows the digestive system.



(i) Give the letter which labels the stomach.

(ii) Give the letter which labels the small intestine.

(iii) Glucose is absorbed in the small intestine.

What carries glucose from the intestine to other parts of the body?

(b) Some athletes take glucose tablets before a race.

Why do they take glucose?

Tick the correct box.

for growth

☐

for healthy bones and teeth

☐

to prevent disease

☐

to provide energy

☐

Section 1: Review of prior knowledge

1. What is the function of the chloroplasts in plants?

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2. What are the key features of diffusion?

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3. Recall the pH of a strong acid

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4. Describe where metals come from

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5. Describe a longitudinal wave

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6. Draw a basic parallel circuit

Section 2: Refreshing current knowledge

1. a) What type of enzyme digests lipids?

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- b) When lipids are digested by enzymes, what are the products?

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- c) How can we test foods for lipids?

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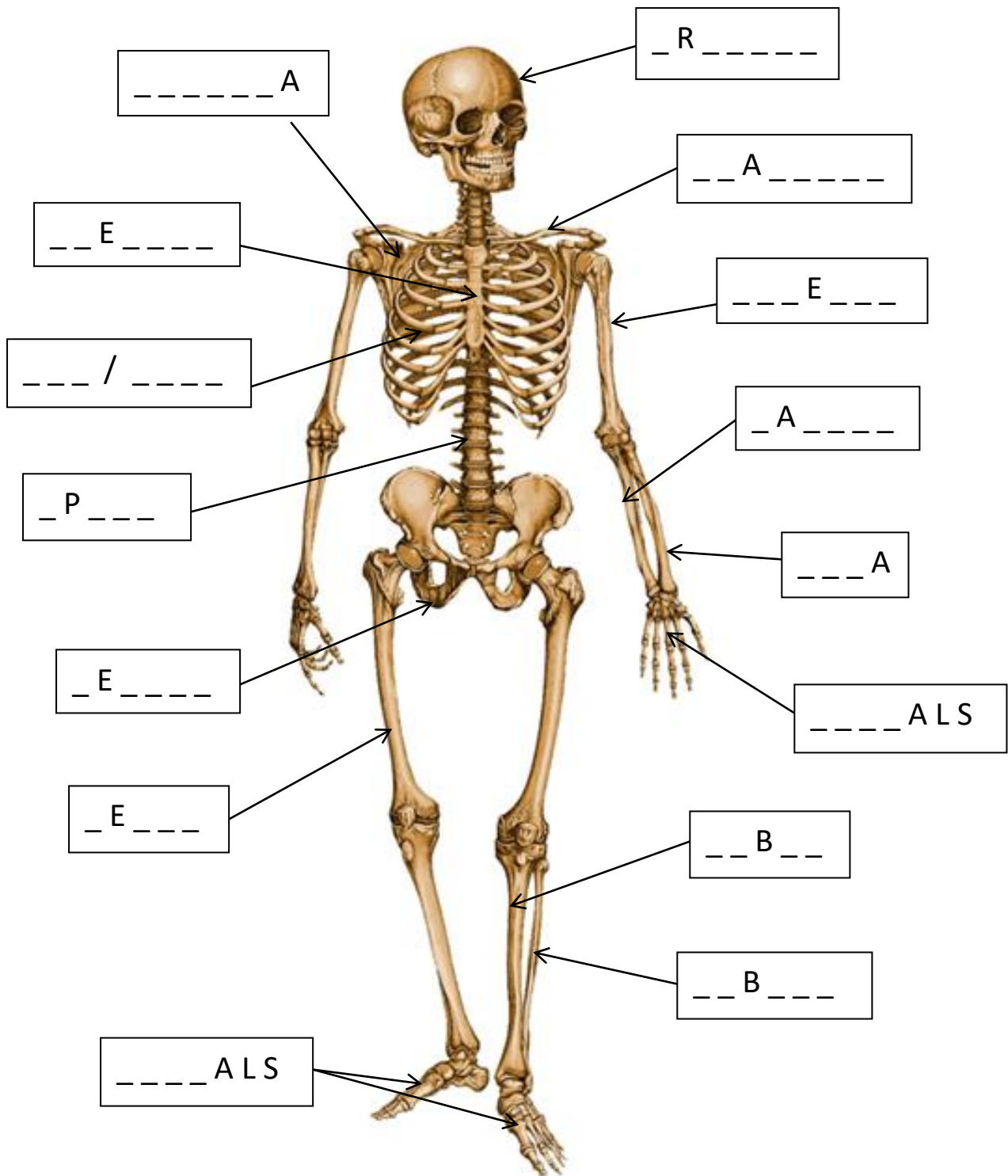
2. Starch and protein are foods which have to be digested before they can be absorbed. For each, state the enzyme involved in the digestion process, where it occurs in the digestive system and what is formed and absorbed.

Food	Enzyme	Where digestion occurs	What is formed and absorbed
Starch
Protein

3. Why do molecules of starch, protein and fat need to be digested?

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LABEL THE HUMAN SKELETON



CARPALS	PELVIS	ULNA	FEMUR	SPINE
	RIB CAGE	CRANIUM	SCAPULA	TIBIA
TARSALS	RADIUS	CLAVICLE		FIBULA
	HUMERUS	STERNUM		

Section 1: Review of prior knowledge

1. What is Respiration?

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2. What is gas exchange?

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3. What are the adaptations of the alveoli?

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4. Where does respiration occur in a cell?

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5. What are the alveoli?

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.....

6. What is Aerobic respiration?

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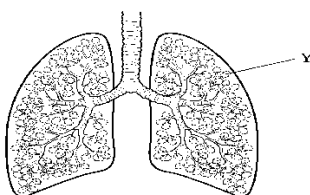
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Section 2: Refreshing current knowledge

1 Air entering the lungs would pass through the following structures in the order:

- A** trachea → bronchus → air sac → alveoli
- B** trachea → bronchus → alveoli → air sac
- C** alveoli → trachea → bronchus → air sac
- D** bronchus → trachea → air sac → alveoli

2 What part of the lung is labelled **Y**, in the diagram?



- | | |
|--------------------|-------------------|
| A diaphragm | B windpipe |
| C air sac | D bronchus |

- 3 The movement of particles from an area where they are in a high concentration to an area where they are in a lower concentration is called:
- A dissolving. B transport.
C diffusion. D excretion.
- 4 Mucus lines the air passages and traps dirt and tiny organisms called microbes. It is moved up and out of the lungs by tiny hairs called:
- A villi. B cilia.
C bristles. D filaments.
- 5 The air we breathe in contains:
- A more oxygen and more water vapour than the air we breathe out.
B more oxygen and less carbon dioxide than the air we breathe out.
C more carbon dioxide and less oxygen than the air we breathe out.
D more carbon dioxide and less water vapour than the air we breathe out.
- 6 Water vapour can be detected using:
- A limewater.
B hydrogencarbonate indicator.
C cobalt chloride paper.
D universal indicator paper.
- 7 Limewater is used to test for:
- A oxygen.
B nitrogen.
C hydrogen.
D carbon dioxide.

Section 3: Application of knowledge

1) Figure 4 is a table that shows the surface area (SA) to volume (V) ratio in three different sized cubes.

cube size (cm)	surface area / SA (cm ²)	volume / V (cm ³)	SA:V ratio
2	24	8	
4	96	64	1.5:1
6	216	216	1:1

(i) Calculate the SA: V ratio for the 2 cm cube.(2)

.....

(ii) Give **one** reason why it is important that human lungs have a high surface area to volume ratio.

(1)

.....

.....

Oxygen is involved with aerobic respiration in cells.

(iii) Which is the correct equation for aerobic respiration?

(1)

- ☐ A oxygen + carbon dioxide → glucose + lactic acid
- ☐ B carbon dioxide + water → oxygen + lactic acid
- ☐ C glucose + oxygen → carbon dioxide + water
- ☐ D glucose + water → carbon dioxide + oxygen

(Total for question = 4 marks)

Section 1: Review of prior knowledge

1. What is anaerobic respiration in humans?

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2. What is Anaerobic respiration in microorganisms e.g. yeast

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3. Describe how to test for carbon monoxide

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4. Define insoluble

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5. Name 2 common waste energies

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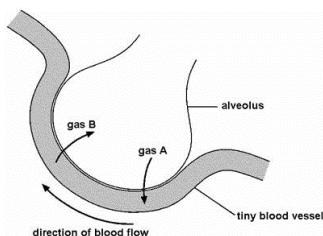
6. Describe how sound is made

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Section 2: Refreshing current knowledge

1) Diagram 2 below shows one alveolus and its blood supply.



(i) Look at diagram 2, above.

Gas A **enters** the blood from the alveolus.

Gas B **leaves** the blood and enters the alveolus.

What are the names of gases A and B?

gas A gas B1 mark

- (ii) Give **one** reason why it is easy for gases to pass across the wall of an alveolus 1 mark

Section 3: Application of knowledge

1) People who have emphysema have damaged air sacs in their lungs. The diagrams show a section through a normal air sac and a section through a damaged air sac.



Normal Alveoli



Alveoli with Emphysema

(a) Gas exchange takes place at the inside surface of the air sac when a person breathes.

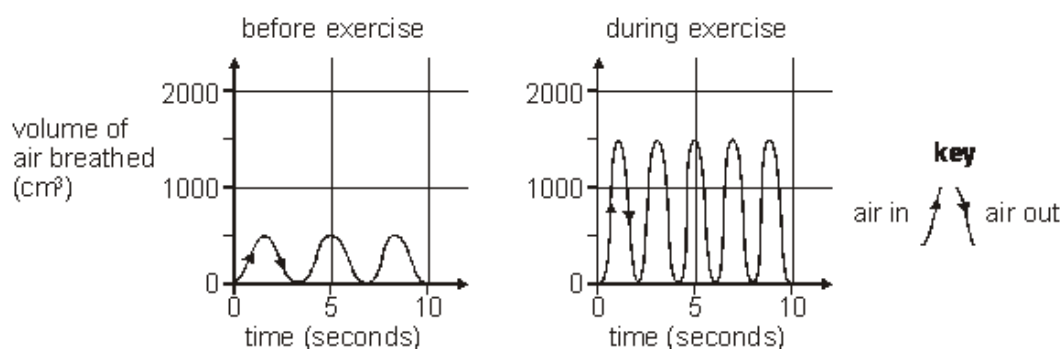
(i) Which **two** gases are exchanged at this surface of the air sac?

..... and1 mark

(ii) The amount of gas exchanged is smaller in a damaged air sac. Explain why.

Q2. Joanne measured the volume of air she breathed in and out of her lungs.

The graphs represent the volume of air Joanne breathed in and out with each breath **before** and **during** exercise.



(a) During exercise Joanne breathed more air in and out of her lungs than before exercising.

(i) How much **more** air did Joanne breathe in with each breath during exercise?

..... cm³

1 mark

(b) (i) As Joanne exercised, the volume of air she breathed in and out increased.

Give **one** other way Joanne's breathing changed during exercise. 1 mark

(ii) How does the graph show this other change? 1 mark

Section 1: Review of prior knowledge

1. Name the organ system that we need for support and movement?

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2. Define friction.

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3. What is respiration?

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4. How do like charges interact?

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5. Describe the particle arrangements for a solid

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6. Define atom

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Section 2: Refreshing current knowledge

Use the word bank to complete the following (you may use key words more than once). (8 marks)

Mitosis is a type of cell that produces cells for or to damaged tissue like skin.

Cells produced by are called cells. These cells are genetically to the parent cell because all the were copied before the division began. Sex cells are called examples of sex cells are , and Gametes only have the number of of the body (somatic) cells. Gametes combine in a process called to produce a with the total number ofneeded to make an embryo.

WORD BANK

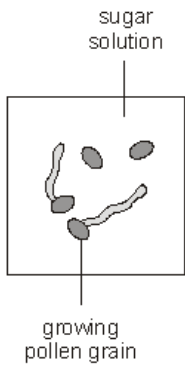
daughter	mitosis	growth	chromosomes	division	identical	repair	egg cells
half	fertilisation	pollen	sperm	zygote	gametes		

Section 3: Application of knowledge

Amy and Tom investigated how sugar affects the growth of pollen grains.

They looked at pollen grains under a microscope.

Amy's Plan	Tom's Plan
<ul style="list-style-type: none"> • Add some pollen grains to one drop of very concentrated sugar solution. • Add some pollen grains to one drop of dilute sugar solution. • Count how many pollen grains have started to grow. 	<ul style="list-style-type: none"> • Add one drop of different concentrations (0%, 5%, 10%, 15%, 20% and 25%) of sugar solution to each slide. • Add the same amount of pollen to each drop. • One hour later count how many pollen grains have started to grow. Work out the percentage.



(a) Give **two** ways in which Tom's plan is better than Amy's plan.

1

2 2 marks

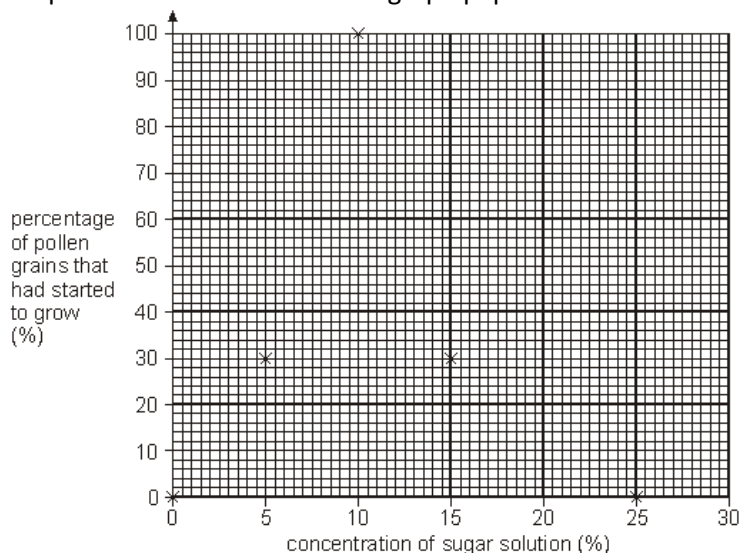
(b) In Tom's investigation, what factor did he change (the independent variable)?

..... 1 mark

(c) Look at Tom's results in the table below.

concentration of sugar solution (%)	percentage of pollen grains that had started to grow (%)
0	0
5	30
10	100
15	30
20	10
25	0

He plotted five of his results on graph paper. Plot the result for 20% sugar solution



1 mark

(d) Tom's conclusion was, 'The greater the concentration of sugar solution, the greater the percentage of pollen grains that had grown.' Do his results support his conclusion?

Use the results in the graph to explain your

answer.....

.....1 mark

Section 1: Review of prior knowledge

1. Describe mitosis

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2. State the pH of a weak alkali

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3. How can we test foods for sugar in food?

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4. Describe the relationship between atmospheric pressure and height.

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5. How are forces represented on diagrams?

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6. Describe the test for hydrogen

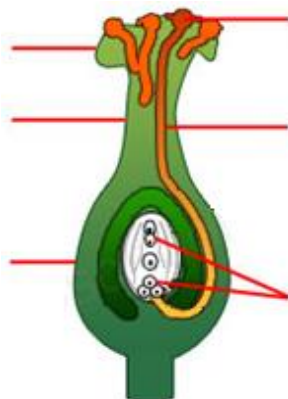
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Section 2: Refreshing current knowledge

1) Add or complete the labels to show what happens during fertilisation in plants

(6 marks)



2) How many chromosomes do human gametes have? Are they haploid or diploid?

(2 marks)

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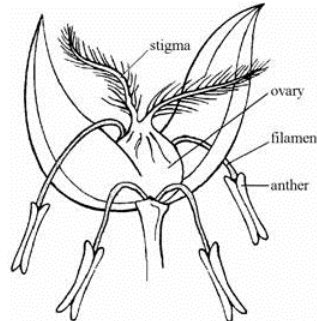
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3) How many chromosomes does a zygote have? Are they haploid or diploid?

(2 marks)

Section 3: Application of knowledge

The drawing shows a single flower of rye grass.



- (a) Rye grass flowers are adapted for wind pollination.
Explain how **two** features, shown on the drawing, show that the flower is adapted for wind pollination.

1.

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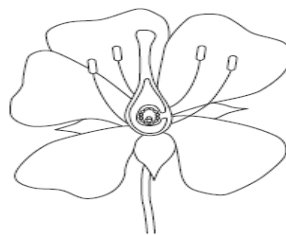
2.

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(2)

- (b) In a single flower, anthers and stigmas usually mature at different times.
What is the advantage of this? (1)

The diagram shows the reproductive parts of a flower.



- (c) Suggest **one** way in which flowers attract pollinating insects. (1)

- (d) The pollen grains land on the female part of the flower. Describe the next stages in the process which results in seed formation. (4)

Section 1: Review of prior knowledge

1. What is the function of the nucleus?

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2. What is the function of the cytoplasm?

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.....

3. State the general word equation of metal oxides reacting with acids

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4. State colour of an acid in universal indicator

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5. What is the equation for calculating speed?

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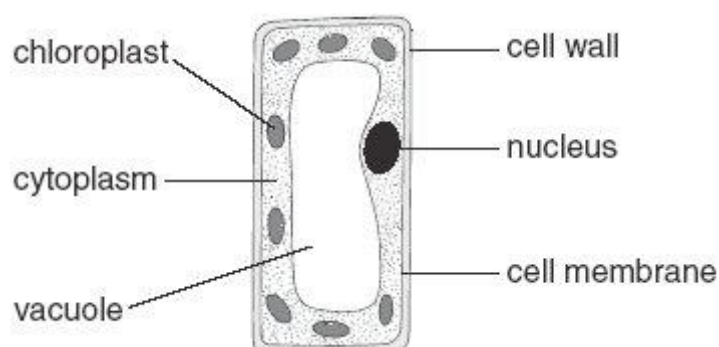
6. What are the SI units for distance?

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Section 2: Refreshing current knowledge

The diagram below shows a plant cell.



(a) In which part of a plant would you find this type of cell? (1)

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(b) (i) Give the function of the nucleus. (1)

.....

(ii) Give the function of the chloroplasts. (1)

.....

(iii) Give the function of the cell wall. (1)

(b) Give the names of **two** labelled parts that are **not** present in animal cells. (2)

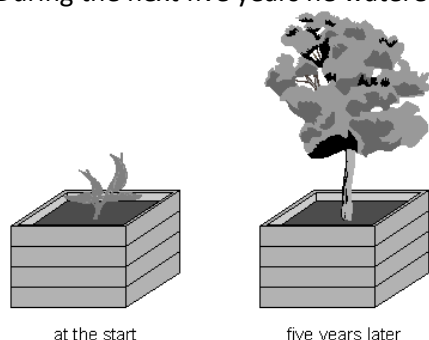
(d) Tick **one** box in each row to show whether the statement is true for photosynthesis **or** for respiration.

statement	photosynthesis	respiration
carbon dioxide is produced		
light is needed		
it occurs in plants and animals		
oxygen is produced		

2 marks

Section 3: Application of knowledge

In the seventeenth century a Belgian scientist, Van Helmont, planted a young willow tree in a tub of dry soil. During the next five years he watered the plant with rain water but he did not add anything else to the tub.



	mass of willow tree, in kg	mass of dried soil, in kg
at the start	2.3	90.6
five years later	76.7	90.5

After five years Van Helmont removed the willow tree from the tub and weighed the tree. He also dried and weighed the soil. Results from Van Helmont's experiment are shown in the table.

(a) Van Helmont concluded that the increase in the mass of the willow tree was due only to a gain in water.

(i) What **two** pieces of evidence did Van Helmont use to reach his conclusion? (2)

(ii) We now know that Van Helmont's conclusion is **not** correct.

Explain why the mass of the willow tree increased by such a large amount. (2)

(b) Van Helmont believed that a plant would always grow faster if it was given more water.

We now know that this is **not** true.

Give **two** environmental conditions which can slow down the growth of a plant, even when it has plenty of water. (2)

(c) The fresh mass of a plant includes water. To measure plant growth accurately, scientists calculate the increase in the dry mass rather than the increase in the fresh mass of a plant. Why is finding the increase in fresh mass **not** a reliable way to measure plant growth? (1)

Section 1: Review of prior knowledge

1. What is the name given to plants in a food web?

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2. What cell structure is responsible for photosynthesis?

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3. State the general word equation of metals reacting with oxygen

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4. Define native metal

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5. Define the term galaxy

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6. Describe what would happen to your mass if you were to visit the moon

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Section 2: Refreshing current knowledge

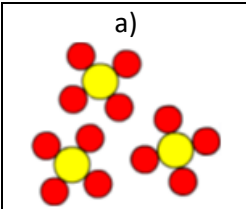
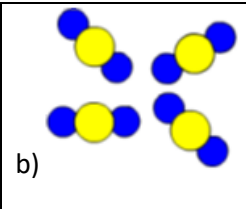
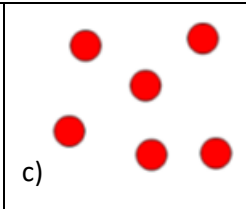
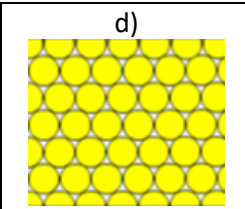
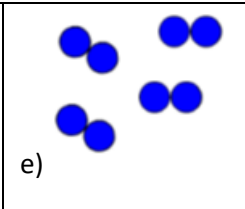
Q1) i) For each diagram in the box, select appropriate words in the box below.

You may use more than one keyword

Atom	Element	Compound	Diatomic molecule	Mixture
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ii) For each diagram select a formula/formulae which could represent the particle diagrams.

C	He	O ₂	CH ₄	CO ₂
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	 <p>a)</p>	 <p>b)</p>	 <p>c)</p>	 <p>d)</p>	 <p>e)</p>
Keywords					
Formula/ Formulae					

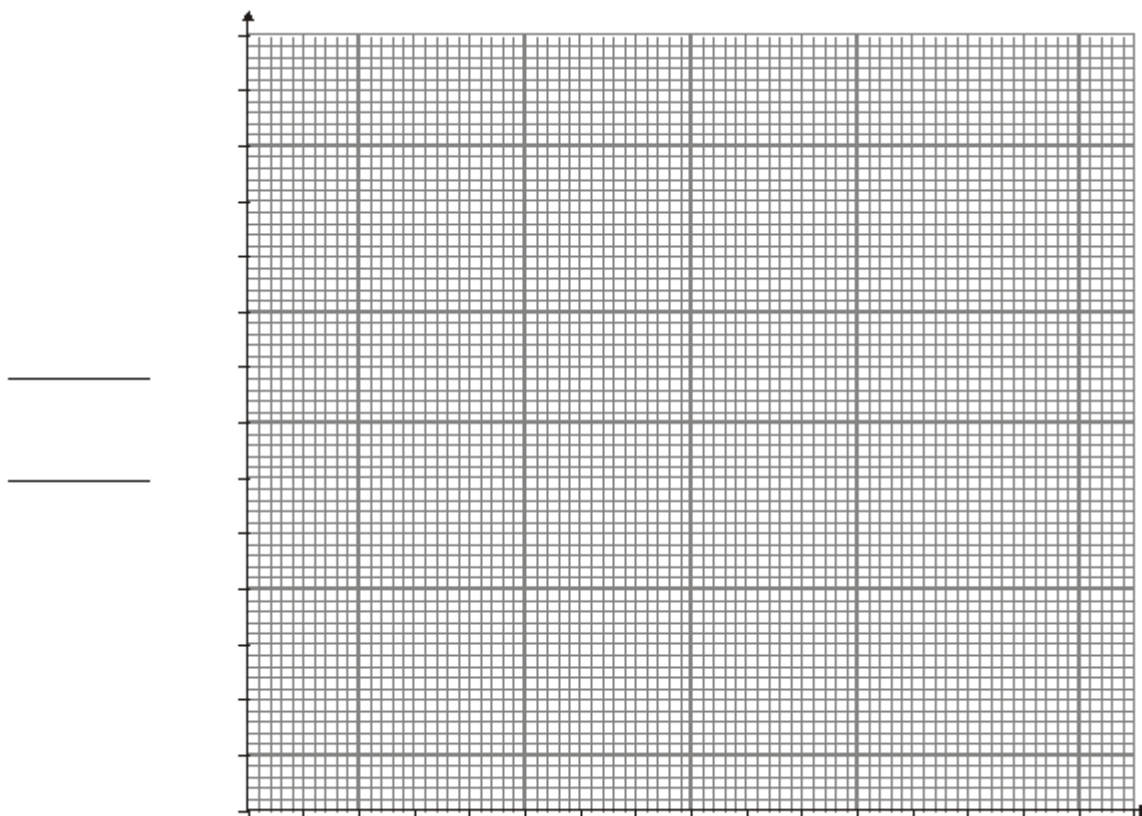
Section 3: Application of knowledge

1) Six groups of pupils burned magnesium in air. The magnesium reacted with oxygen to form magnesium oxide. They recorded the mass of magnesium used and the mass of magnesium oxide formed. Their results are shown in the table.

group	mass of magnesium (g)	mass of magnesium oxide (g)
A	3.2	5.2
B	3.8	6.5
C	4.2	7.0
D	4.9	8.6
E	5.4	8.0
F	6.1	10.7

(a) Use their results to draw a graph below. (4)

- Decide the scale for each axis.
- Plot the points.
- Label the axes.
- Draw a line of best fit.



(b)(i) Which group's results do **not** fit the general pattern? Give the letter. (1)

.....

(ii) How should the class deal with this 'odd' result? (1)

.....

.....

(c) Use the graph to predict the mass of magnesium oxide that will be formed by burning 7.0 g of magnesium. (1)

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(d) The results show the relationship between the mass of magnesium and the mass of magnesium oxide formed. What conclusion could you draw about this relationship? (1)

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Section 1: Review of prior knowledge

1. What is biodiversity?

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2. What is digestion?

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3. State the general word equation of metal oxides reacting with acids

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.....

4. What is a compound?

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.....

5. How is weight calculated?

.....

.....

6. What could the motion of the object be if forces are balanced?

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Section 2: Refreshing current knowledge

1) Write the word equations for these reactions

a) When you add potassium to water it produces potassium hydroxide and hydrogen

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b) Nitric acid will react with lithium hydroxide to form lithium nitrate and water

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c) Calcium carbonate reacts with sulphuric acid to form calcium sulphate, water and carbon dioxide

.....

2) i) Complete the word equations. **ii)** Circle a reactant and underline a product in each word equation.

a) Lead + oxygen →

b) Sodium + → sodium chloride

c) Copper + bromine →

d) + → iron sulphide

e) + water → lithium hydroxide + hydrogen

3) Write balanced symbol equations for the following reactions

a) Nitrogen (N_2) bonding with hydrogen (H_2) to form ammonia (NH_3)

.....

b) Hydrogen bonding with oxygen to form water

.....

c) Sodium reacting with water to form sodium hydroxide (NaOH) and hydrogen gas

.....

d) Potassium reacting with magnesium bromide (MgBr) to form potassium bromide (KBr) and magnesium

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e) Hydrochloric acid reacting with calcium carbonate (CaCO_3) to form Calcium chloride (CaCl_2), water and carbon dioxide.

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f) Sulphuric acid (H_2SO_4) reacting with sodium nitrite (NaNO_2) to form nitrous acid (HNO_2) and sodium sulphate (Na_2SO_4)

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Section 3: Application of knowledge

1) Beryllium has an atomic number of 4 and a mass number of 9. A nucleus can be described using this symbol.



The number of neutrons in this nucleus is... (1)

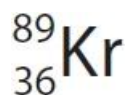
A 4

B 5

C 9

D 13

2) Krypton can be represented as



Describe the structure of a nucleus of krypton (4)

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Section 1: Review of prior knowledge

1. What is respiration?

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2. What are the components of blood?

.....

.....

3. What do the following prefixes mean? a) mon b) di c) tri

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4. Use a simple kinetic theory model to explain solids in terms of movement and arrangement of particles

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5. If all of the opposing forces acting on the object are the same size, what is the resultant force?

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6. State walking speed in m/s

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Section 2: Refreshing current knowledge

1) State what is meant by atomic number (1)

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.....

2) Explain what is meant by relative atomic mass (2)

.....

.....

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Here is some information about the periodic table.

The position of an element in the periodic table depends on its atomic structure.

Identify different parts of the periodic table and explain how the position of an element in the periodic table is linked to its chemical properties and atomic structure.

Section 1: Review of prior knowledge

1. Name the type of enzyme that digests carbohydrates and the product of this reaction.

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.....

2. Name two jobs of the skeleton.

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.....

3. Define the mass number

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.....

4. What is the maximum number of electrons in the first energy level?

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5. Define friction.

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6. How does pressure vary with depth?

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Section 2: Refreshing current knowledge

1) Complete the table below

	Solids	Liquids	Gases
Compressibility			
Shape			Fill the container
Density	High		
Flow			

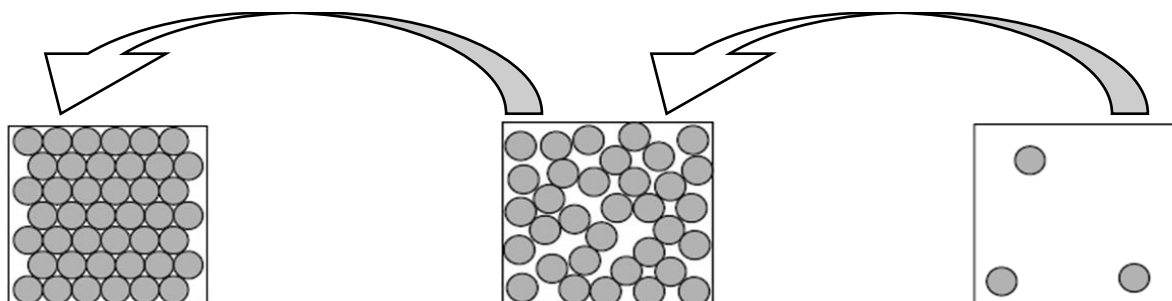
2) Complete the sentences for the state changes occurring in the diagram below

The particles get _____ together.

The particles are _____ to each other in a liquid.

The particles have less energy so they don't move as _____.

The particles move much _____ than in a gas

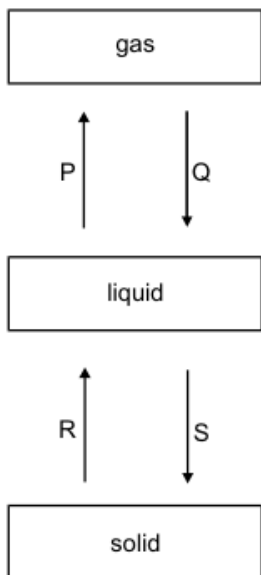


Section 3: Application of knowledge

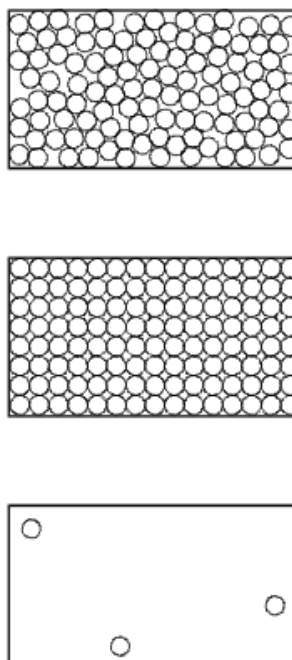
(a) Methane can be a gas, a liquid or a solid. In the diagram below, arrows P, Q, R and S represent changes of state. The boxes on the right show the arrangement of particles of methane in the three different physical states. Each circle represents a particle of methane.

(i) Draw a line from each physical state of methane to the arrangement of particles in that physical state. Draw only three lines. (1)

physical state of methane



arrangement of particles



(ii) Arrows P, Q, R and S represent changes of state. Which arrow represents: (2)

evaporation?

melting?

(b) Methane is the main compound in natural gas. The scale below shows the melting point and the boiling point of methane. Methane has three physical states: solid, liquid and gas.

(i) What is the physical state of methane at -170°C ? (1)

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Section 1: Review of prior knowledge

1. Name the type of enzyme that digests lipids (fats and oils) and the product of this reaction.

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2. How can we test for starch?

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3. How can we know the number of protons in an atom?

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4. What is the chemical symbol for the oxygen?

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5. State the units of force.

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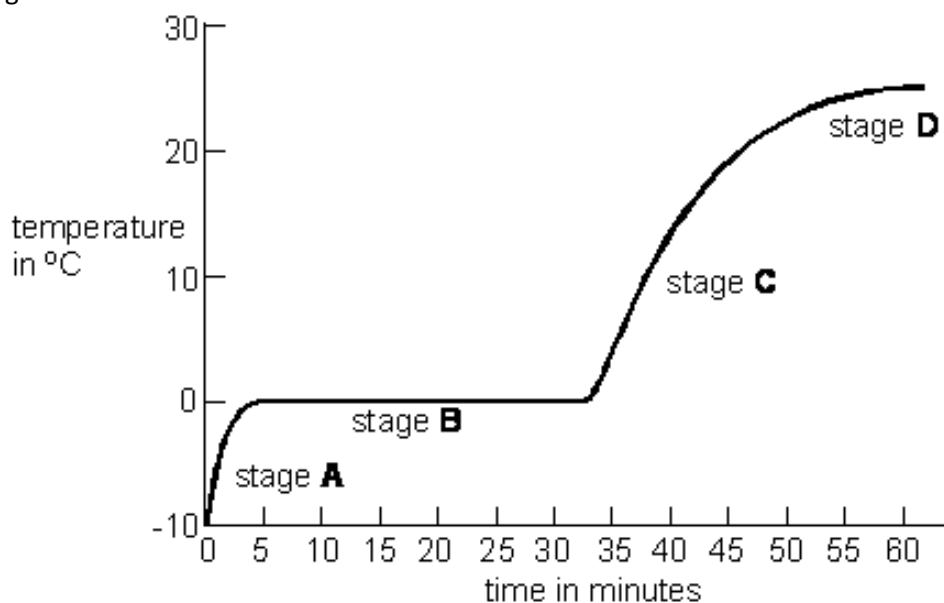
6. Why does gas pressure vary with height/depth?

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Section 2: Refreshing current knowledge

A test tube of crushed ice is taken out of a freezer and left in a warm room. The graph shows how the temperature in the test tube changes.



(a) What is happening to the ice at stage B? (1)

(b) Why does the temperature of the water stop rising at 23°C (stage D)? (1)

(c) Four descriptions of the ways molecules could move are given below.

1. They vibrate around fixed points. ☐
2. They move past each other and are close together. ☐
3. They move in straight lines, colliding occasionally. ☐
4. They all move in the same direction at the same speed. ☐

(i) How do the molecules move at stage A? **Write A in the correct box above.** (1)

(ii) How do the molecules move at stage C? **Write C in the correct box above.** (1)

(d) Ice from a freezer is put in a glass of water at room temperature. The ice floats in the water.

(i) What does this show about the density of the ice compared to that of water? **Tick the correct box.** (1)

1. Ice is more dense than water. ☐
2. Ice and water have the same density. ☐
3. Ice is less dense than water. ☐
4. Ice has a density of zero. ☐

(ii) The fact that ice floats in water tells us something about the distances between the molecules.

Tick the box by the correct statement. (1)

1. The molecules are further apart in ice than in water. ☐
2. The molecules are the same distance apart in ice and in water. ☐
3. The molecules are closer together in ice than in water. ☐

Section 3: Application of knowledge

1) The freezing point of water is 0°C. Describe how the movement and arrangement of water particles changes when water is cooled from 10°C to -10°C. (2)

2) The image shows a tray of marbles being shaken from side to side. As this happens, some of the marbles jump out of the tray. Explain how the tray of marbles is acting as a model for the evaporation of a liquid. (2)



Section 1: Review of prior knowledge

1.

What is the function of the cell membrane?

2.

What is an enzyme?

3.

Which observation always shows that a chemical reaction has occurred?

4.

What are the chemicals at the start of a chemical reaction called (to the left of the arrow in the middle)

5.

Define wavelength and state its unit

6.

Describe the structure of metals

Section 2: Refreshing current knowledge

1) Melting, boiling, freezing and condensing are the names of four changes of state. Draw lines to join each name to the correct change of state.

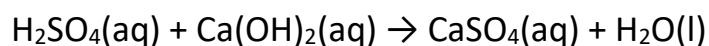
name

melting
boiling
freezing
condensing

change of state

gas to liquid
liquid to gas
solid to liquid
liquid to solid

2) Add labels on the dotted lines under this word equation to show which chemicals are *reactants* and which chemicals are *products*



.....

.....

3) Add a tick beside each statement to show whether it is true for physical changes or chemical reactions.

	Physical	Chemical
A new substance is formed		
Atoms are rearranged		
The same substance is found at the start and at the end of the change		
Ice melts and becomes water		
A match is burned		
A cloud turns in to rain		
$\text{HCl (l)} \rightarrow \text{HCl (g)}$		
$\text{CuCO}_3\text{(s)} \rightarrow \text{CuO(s)} + \text{CO}_2\text{(g)}$		

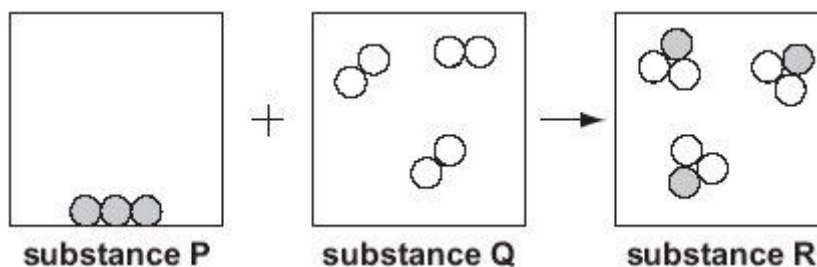
Section 3: Application of knowledge

1) Listed below are five changes. Tick the boxes for the two changes that are the result of **chemical** reactions.

(2)

- ☐ Making yoghurt from milk
- ☐ Boiling water in an electric kettle
- ☐ Burning petrol in a car engine
- ☐ Diluting orange juice by adding water to it
- ☐ Making aluminium cans from a block of solid aluminium metal

2) The diagram below shows a model of a chemical reaction between two substances.



How can you tell from the diagram that a chemical reaction took place between substance P and substance Q? (1)

If substance R is carbon dioxide (CO_2) and substance Q is oxygen (O_2), what must substance P be? (1)

How does the diagram show that mass has been conserved in this reaction? (2)

The amount of substance R produced was measured to be 44 g. The amount of substance Q that reacted to form this was measured to be 32 g. What must the mass of substance P that reacted have been? (1)

Section 1: Review of prior knowledge

1.

State what an abiotic factor is	
---------------------------------	--

2.

Plants convert light energy into _____ energy	
---	--

3.

What are the chemicals at the end of chemical reaction called (to the right of the arrow in the middle)	
---	--

4.

Describe what happens to bonds between atoms in <i>reactants</i> during a chemical reaction.	
--	--

5.

What is the function of an ammeter?	
-------------------------------------	--

6.

Draw an energy transfer diagram for when a ball falls and lands on the ground	
---	--

Section 2: Refreshing current knowledge

1. A reaction is happening in a test tube. When you hold the test tube your hand gets warmer. What type of reaction is happening? Exothermic or endothermic?

.....

.....

2. When methane burns the atoms in the methane and oxygen from the air rearrange to form water and carbon dioxide. Fill in the gaps in the word equation below so that it shows this reaction.

methane + → carbon dioxide +

3. Name one of the products in the reaction above:

.....

4. True or false, when atoms bond together to form products energy is released to the surroundings?

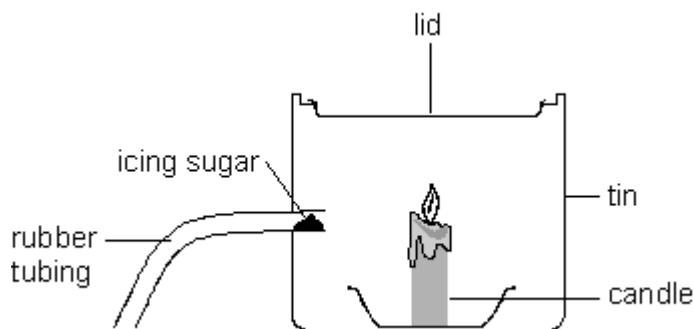
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5. A reaction happens where more energy is taken in to break bonds between atoms in the reactants than the energy that is given out when bonds are formed between atoms in the products. Is this reaction exothermic or endothermic?

.....

Section 3: Application of knowledge

Q1. A teacher set up the following apparatus behind a safety screen. She placed 1 g of icing sugar in the end of the rubber tubing inside the tin, as shown below.



The teacher blew through the other end of the rubber tubing.
The icing sugar came into contact with the flame.
There was a loud explosion and the lid was blown off the tin.

(a) Complete the following sentence describing the energy changes which took place.

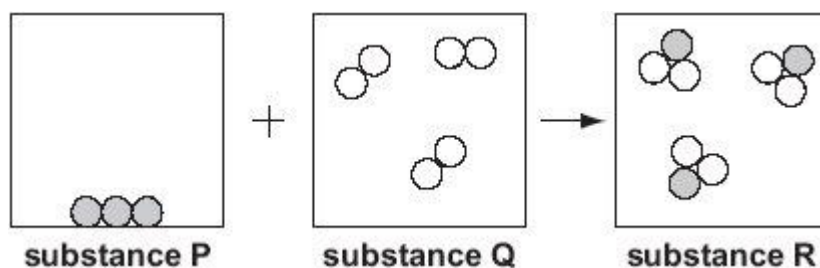
(3)

..... energy in the icing sugar changed to

..... energy and energy.

Q2. Energy is required to break chemical bonds, but energy is released when chemical bonds are formed.

The diagram below shows a model of a chemical reaction between two substances.



- It takes 70 J of energy to break all of the bonds between the atoms in substance P.
- It takes 150 J of energy to break all of the bonds between the atoms in substance Q.
- 480 J of energy is released to the surroundings when all of the bonds between the atoms in substance R form.

Is this reaction exothermic or endothermic?

(1)

.....

Why?

(2)

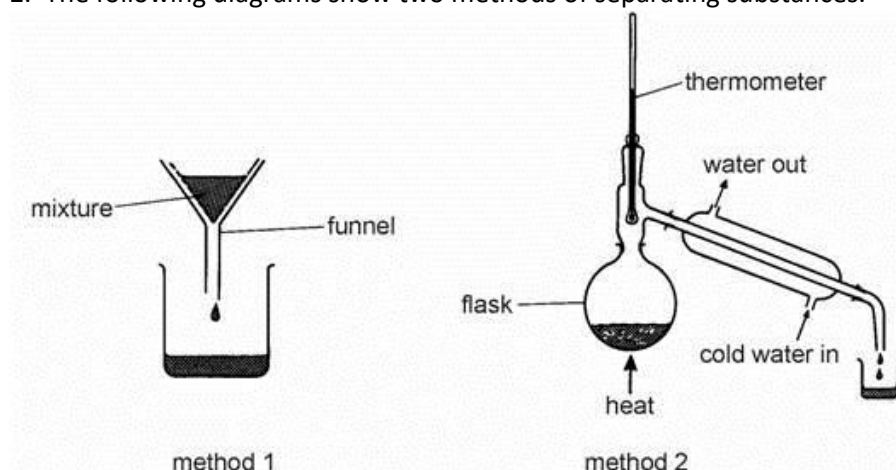
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Section 1: Review of prior knowledge

1. What is ovulation?	
2. What are the components of blood?	
3. What is distillation?	
4. What type of mixture is separated by distillation?	
5. Define echo	
6. State the difference between a permanent and induced magnet	

Section 2: Refreshing current knowledge

1. The following diagrams show two methods of separating substances.



(a) What is the name of each method?

Method 1 is

Method 2 is

(b) (i) Tick one box to show which of the mixtures can be separated by method 1.

- ☐ sugar and salt
- ☐ sand and water
- ☐ dissolved salt and water
- ☐ sand and iron filings
- ☐ sugar and salt, both dissolved in water

(ii) From the list give a mixture which can be separated by method 2 but **not** by method 1.

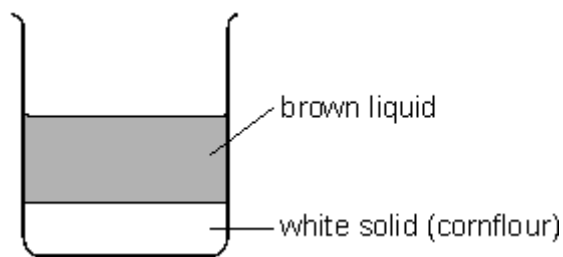
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Section 3: Application of knowledge

Gravy powder contains:

- a brown substance to make the gravy brown;
- cornflour to make the gravy thick.

Dan mixed some gravy powder with cold water in a beaker. An hour later, the contents of the beaker looked like this →



- (a) Use the words in the list below to fill the gaps in the following sentences.

solvent solution soluble insoluble

The brown substance dissolves in water to form a brown The cornflour settles at the bottom of the beaker because it is in water.
Water is the in this experiment.

- (b) Dan wanted to separate the brown liquid from the white solid.
What could he do to separate them?

.....

- (c) Dan put a little of the brown liquid in a dish. The next day there was only a brown solid left in the dish.
What had happened to the water?

.....

- (d) Dan wanted to get pure water from the rest of the brown liquid. Describe in detail how he could do this.

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Section 1: Review of prior knowledge

1 Name two other components of a healthy diet that aren't nutrients.

.....

.....

2 Name the unicellular organisms that live in the human digestive system and keep it healthy.

.....

.....

3 Where on the period table are the halogens found?

.....

.....

4 Where on the period table are the noble gases found?

.....

.....

5 How do you calculate relative motion if two objects are moving in the same direction?

.....

.....

6 How do you calculate relative motion if two objects are moving in opposite directions?

.....

.....

Section 2: Refreshing current knowledge

1 (a) Complete the sentence by putting a cross (☒) in the box next to your answer. The Earth's earliest atmosphere is thought to have been formed by

- ☐ A animals breathing
- ☐ B photosynthesis in plants
- ☐ C the oceans cooling
- ☐ D gases from volcanoes

(b) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.
The Earth's earliest atmosphere contained large amounts of carbon dioxide.
The percentage of carbon dioxide in the Earth's atmosphere today is

- ☐ A less than 1%
- ☐ B 5%
- ☐ C 21%
- ☐ D 78%

(ii) Write the formula of a molecule of carbon dioxide.....

(iii) The percentage of carbon dioxide in the atmosphere has decreased since the Earth's earliest atmosphere. Explain what has caused the amount of carbon dioxide in the atmosphere to decrease.

.....

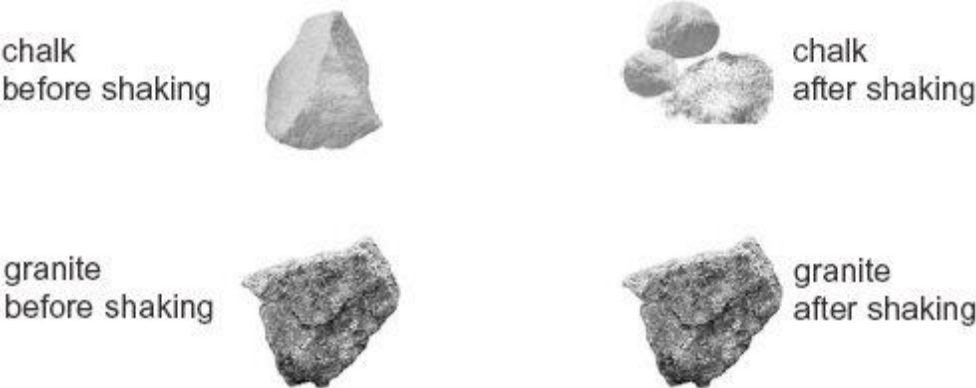
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Section 3: Application of knowledge

2. Raj put a piece of chalk in one container and a piece of granite in another container. He shook both containers for two minutes. The photographs below show what happened.



- (a) (i) Give **two** ways the **chalk** had changed.
 - 1.
 - 2.
- (ii) Suggest why the **granite** did **not** change.

.....

(b) The photograph below shows the remains of an animal found in chalk rock.



- (i) What are the remains of living things found in rock called?
-
- (ii) Look carefully at the animal remains in the photograph. Which animal could it be related to? Tick the correct box.

snail	starfish	ladybird	slug
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Give a reason for your answer.

.....

.....

.....

Section 1: Review of prior knowledge

1 Name the organ system that we need for support and movement

.....

.....

2 What do we call a pair of muscles that control the movement of a joint?

.....

.....

3 What is freezing?

.....

.....

4 What is condensing?

.....

.....

5 Define thermal radiation

.....

.....

6 Define conduction

.....

.....

Section 2: Refreshing current knowledge

1. Burning fossil fuels causes air pollution. (a) (i) Give the names of **two** fossil fuels.

..... and

(ii) Some fossil fuels contain sulphur.

Complete the word equation for the reaction between sulphur and oxygen in the air.

sulphur + oxygen →

(b) Burning fossil fuels leads to the formation of acid rain. Acid rain can collect in lakes. A helicopter can be used to drop calcium hydroxide into the lakes. Calcium hydroxide dissolves in water to form an alkaline solution.

(i) What effect does an alkali have on the pH of an acidic lake?

.....

(ii) When calcium hydroxide reacts with sulphuric acid in the lake a calcium salt is formed. What is the name of this salt? Tick the correct box.

calcium carbonate	<input type="checkbox"/>	calcium chloride	<input type="checkbox"/>
calcium nitrate	<input type="checkbox"/>	calcium sulphate	<input type="checkbox"/>

Section 3: Application of knowledge

2. The drawing below shows the remains of an animal found in a rock.



- (a) Some scientists think the animal in the drawing above was a bird.
(i) Give **one** feature of the animal above that suggests it was a bird.

Other scientists think the animal was a reptile.

- (ii) What are reptile skins covered with?

- (b) The animal lived millions of years ago. Scientists used the remains to draw what they think the animal looked like when it was alive.



Why can scientists **not** be certain that the animal looked like the drawing above?

- (c) Give the name for the remains of living things found in rocks.

- (d) Igneous rocks can be formed from lava from volcanoes. The remains of living things are **not** found in rocks made from lava. Why does lava destroy the remains of living things?

Section 1: Review of prior knowledge

1 Give two reasons why cells need food.

.....

.....

2 What is Respiration

.....

.....

3 What is produced when magnesium burns with oxygen?

.....

.....

4 What are the three states of matter?

.....

.....

5 State a unit for pressure.

.....

.....

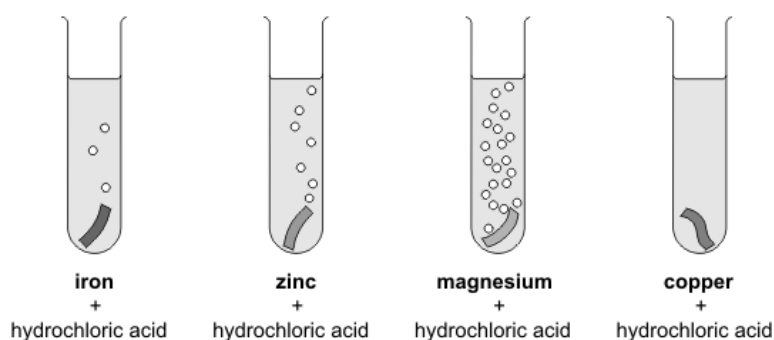
6 State the units of force

.....

.....

Section 2: Refreshing current knowledge

Q1. (a) Ruth put a piece of a different metal in each of four test tubes. She poured 10 cm³ of hydrochloric acid onto each metal.



Look at the diagrams above. (i) How do these show if a metal reacts with the acid?

.....

.....

(ii) **On the lines below**, put the **four** metals in the order of how strongly they react with the acid.

most reactive

.....

.....

least reactive

Section 3: Application of knowledge

2. Lithium, sodium and potassium are reactive metals in group 1 of the periodic table.

In an experiment equal-sized pieces of lithium, sodium and potassium are added to separate samples of water.

(i) A flame is produced only with potassium because potassium

- ☐ A is the softest metal
- ☐ B has the lowest melting point
- ☐ C is the most reactive
- ☐ D is the only flammable metal

* (ii) A teacher demonstrated this experiment.

The results are shown in Figure 14.

	lithium	sodium	potassium
position of metal in water	floats	floats	floats
movement of metal	slow	fast	very fast
effervescence / bubbling	slow	fast	very fast

Figure 14

Describe, in detail, how the teacher would demonstrate this experiment safely, showing how the results give the order of reactivity of the metals.

.....

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3. Magnesium reacts very slowly with cold water but it reacts faster with steam, H_2O , to form magnesium oxide, MgO , and hydrogen.

Write the balanced equation for the reaction between magnesium and steam.

.....

Section 1: Review of prior knowledge

1 How can we test foods for sugar?

.....

.....

2 Why do cells do mitosis?

.....

.....

3 Define the atomic number

.....

.....

4 What is freezing?

.....

.....

5 What instrument is used to measure temperature?

.....

.....

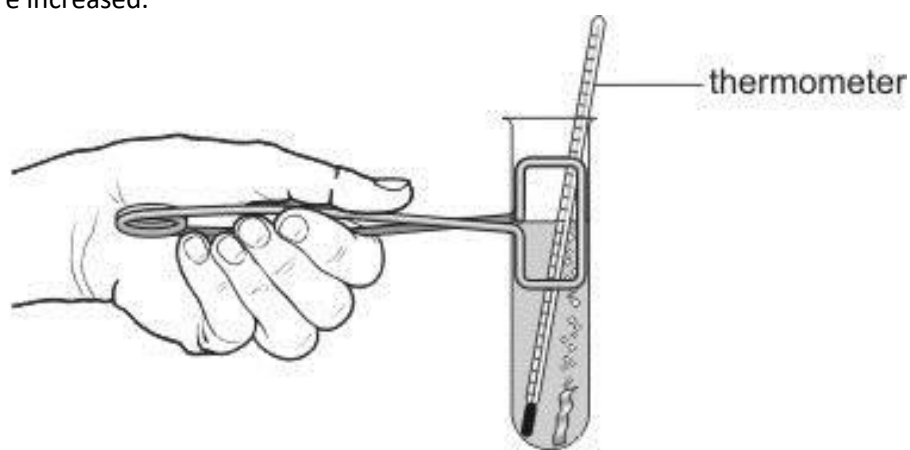
6 What are the units for temperature?

.....

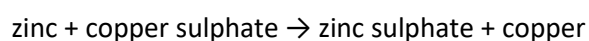
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Section 2: Refreshing current knowledge

1. Harry mixed zinc with copper sulphate solution in a test-tube. A displacement reaction took place and the temperature increased.



(a) The word equation for the reaction is shown below.



Why is this reaction called a displacement reaction?

.....

.....

Section 3: Application of knowledge

2 (a) Harry repeated the experiment with two other metals. He wanted to calculate the temperature rise each time. His results are shown below.

metal added to copper sulphate	temperature at the start (°C)	highest temperature reached (°C)	rise in temperature (°C)
zinc	20.0	36.5	16.5
iron	25.5	38.5	13.0
magnesium	19.5	87.5	68.0

Harry used different starting temperatures.
Explain why this did **not** affect his results.

.....

.....

.....

.....

(b) Part of the reactivity series of metals is shown below.

most reactive	sodium
	calcium
	magnesium
	aluminium
	zinc
	iron
	lead
least reactive	copper

Use the reactivity series above to answer all the questions below.

(i) Why was the highest rise in temperature obtained with magnesium and copper sulphate?

.....

.....

(ii) Why was the rise in temperature obtained with zinc and copper sulphate **not** much higher than the rise in temperature obtained with iron and copper sulphate?

.....

.....

(iii) In which of the following mixtures would there be a rise in temperature? Write **yes** or **no** in each blank box.

mixture	Would there be a rise in temperature?
aluminium + sodium chloride	
calcium + zinc sulphate	
lead + zinc chloride	
magnesium + iron chloride	

Section 1: Review of prior knowledge

1. What is the function of the nucleus?

.....

.....

2. What is respiration?

.....

.....

3. What is a particle?

.....

.....

4. What is a mixture?

.....

.....

5. Recall pH of:

- a) Strong acids
- b) Weak acids
- c) Neutral substances
- d) Weak alkalis

Strong alkalis

.....

.....

6. What is the equation for calculating speed?

Section 2: Refreshing current knowledge

1) What is Newton's First Law of Motion?

.....

.....

2) Describe an example of Newton's First Law of Motion. You may use labelled diagrams if it helps.

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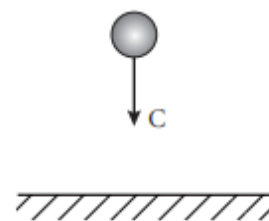
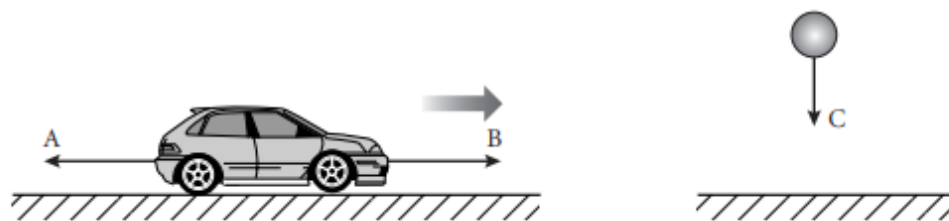
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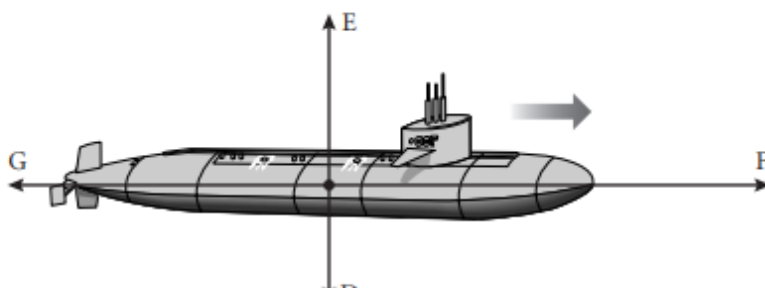
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3)

a Name the forces shown by the letters A to G in the diagrams of moving objects below.



- A)
- B)
- C)
- D)
- E)
- F)
- G)



b The length of the line represents the size of the force. The longer the line, the bigger the force. The arrow on each force shows its direction.

i List the pairs of forces that are balanced.

ii List the pairs of forces that are unbalanced.

c Describe the motion of each object.

CAR.....BALL.....

SUBMARINE.....

Section 3: Application of knowledge

Q. When a car is being driven along, two horizontal forces affect its motion. One is air resistance and the other is the forward force.



(a) (i) Compare the sizes of the forward force and the air resistance when the car is speeding up.

The forward force is

.....

1 mark

(c) The forward force has to be larger when the car is travelling at a steady 60 mph than when it is travelling at a steady 30 mph. Why is this? (1)

.....

.....

1 mark

Section 1: Review of prior knowledge

1. What is a zygote?

.....

.....

2. What are the key features of diffusion?

.....

.....

3. State 2 common waste energies

.....

.....

4. Define current

.....

.....

5. State the difference between a permanent and induced magnet

.....

.....

6. Name 9 different forms of energy

.....

.....

Section 2: Refreshing current knowledge

1) What is Newton's Second Law of Motion?

.....

.....

2) Complete the table

	Symbol	Units
Force		
Mass		
acceleration		

3) Complete the following calculations, please show your working out, any rearrangement of the equation, give the units of your answer.

a) What force is used to cause an object with a mass of 7kg to accelerate to 6m/s^2 ?

b) What force is used to cause an object with a mass of 500g to accelerate to 10m/s^2 ?

c) A force of 60N causes an object accelerate to 30m/s^2 , what is the mass of the object?

Section 3: Application of knowledge

The diagram shows a car and a van.



The two vehicles have the same mass and identical engines.

Explain why the top speed of the car is higher than the top speed of the van.

.....

.....

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.....

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(4)

8P3 – Energy Homework 1 Answers

Section 1 Prior knowledge.

1) What is the unit of force?

Newton N

2) What instrument is used to measure force ?

Newton meter

3)

.....

.....

4)

.....

.....

5)

.....

.....

6)

.....

.....

Section 2 Review of current knowledge.

Q4.

(a) Each of the four objects shown above started at room temperature.

Now they are all at different temperatures, as described by the labels.

(i) Which object is at the highest temperature?

.....

1 mark

(ii) Which object has lost thermal energy?

.....

1 mark

(iii) Which object has had the largest gain in thermal energy?

.....

1 mark

(b) Omar puts a hot steel ball into a beaker of cold water. He waits until the temperatures of the ball and the water are the same.

From his results, he calculates that:

the thermal energy stored in the steel ball has fallen by 3770 J;

the thermal energy stored in the water has risen by 2940 J.

The energy stored in the water rose by less than 3770 J. What has happened to the other 830 J?

.....

.....

Section 3 Application of knowledge.

Look at the diagram below. Using you knowledge of heat transfers complete the text boxes for the four different part of the pan. You need to suggest a suitable material or materials that you could make each of the four parts out of and then explain why you have chosen that material. Use the information in the table to help you with your answers.

Material How good is it at conducting heat? How strong is it? How heavy is it? How expensive is it?

Iron 3 5 5 2

Aluminium 4 3 2 4

Copper 5 4 4 5

Wood 1 2 2 2

Glass 2 2 3 4

8P4 Waves Homework task 1

Due Date:

Section 1: Review of prior knowledge

1. What is a mixture?

.....

.....

2. Give the formulae for oxygen, carbon dioxide and water.

.....

.....

3. What is kinetic energy?

.....

.....

4. What is Newton's first law of motion?

.....

.....

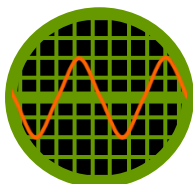
5. How do you calculate relative motion if two objects are moving in opposite directions?

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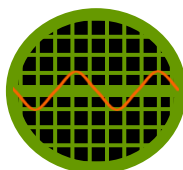
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Section 2: Refreshing current knowledge

1)



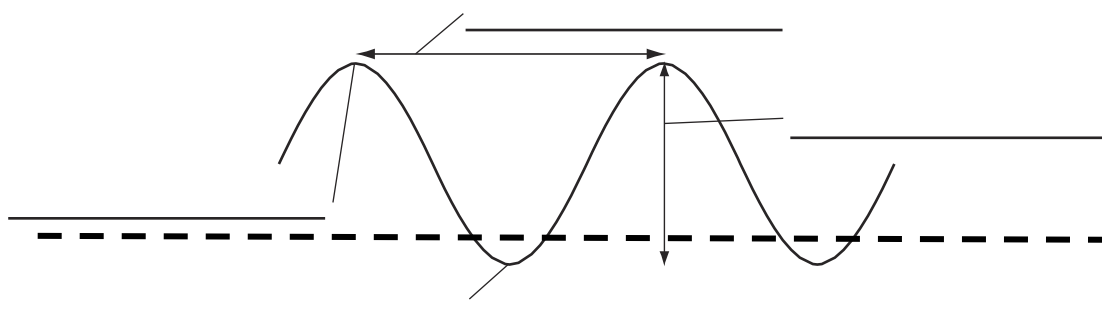
A



B

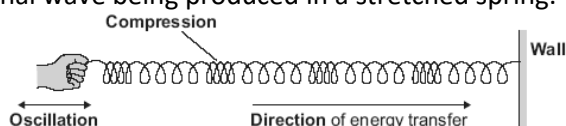
Which trace, A or B, represents the loudest sound?

2) Label the wave below, using words from the box:



crest	amplitude	trough	wavelength
-------	-----------	--------	------------

3) The diagram shows a longitudinal wave being produced in a stretched spring.



(i) Use the bold words from the diagram to complete the following sentence. Put only **one** word in each space.

oscillation amplitude direction wall particles
 A longitudinal wave is one in which the causing the wave is parallel to the
 of energy transfer.

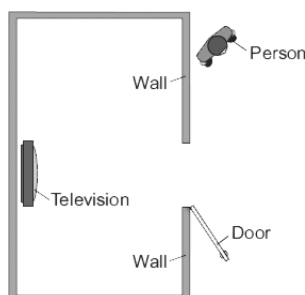
4) List at least three uses of sound waves.

.....

.....

Section 3: Application of knowledge

1)) A television is switched on inside a room. A person outside the room can hear the television, but only when the door is open.

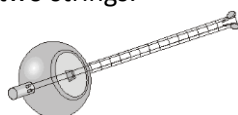


When the door is open, the person can hear the sound but cannot see the television. Explain why.

.....

.....

2) The dotar is a musical instrument with two strings.



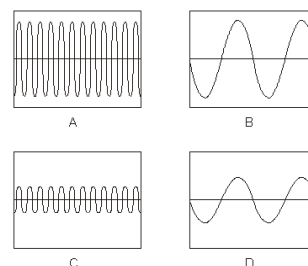
(a) Aftal plays the dotar very quietly. What must he do to the strings to make a louder sound?

.....

.....

(d) Aftal played the dotar near a microphone connected to an oscilloscope. The diagrams below show the patterns made by four sounds.

(i) How does the sound shown in trace A differ from the sound in trace B?



(ii) How does the sound shown in trace A differ from the sound in trace C?

.....

Section 1: Review of prior knowledge

1. What are the sub atomic particles and what are their charges?

.....

.....

2. What is relative motion?

.....

.....

3. Give two reasons why cells need food.

.....

.....

4. What is it called when an enzyme loses its shape because it has become too hot or the pH is wrong?

.....

.....

5. State the formula for speed.

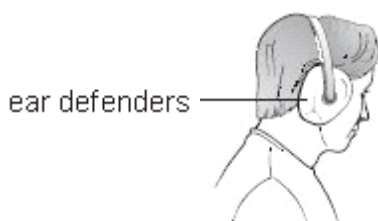
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Section 2: Refreshing current knowledge

Q1. Three pupils watched a firework display.

(a) A man lit the fireworks. He wore ear defenders. Why should he wear ear defenders when he is close to loud fireworks? (1)



.....

.....

(b) A rocket exploded making a loud sound and a bright flash. Peter, Sabrina and Jan were standing at different distances from the rocket.



When the rocket exploded, Jan heard the quietest sound. Why did Jan hear the quietest sound? (1)

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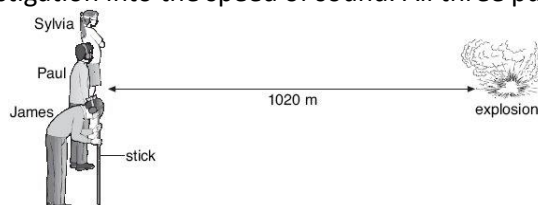


(c) Jan saw the flash before she heard the sound. What does this tell you about the speed of light and the speed of sound? (1)

.....

Section 3: Application of knowledge

Q2. Three pupils took part in an investigation into the speed of sound. All three pupils stood 1020 m from an explosion.



- Sylvia wore a blindfold.
- Paul wore ear defenders.
- James wore a blindfold **and** ear defenders. He rested his head on a wooden stick pushed into the ground so that he could feel vibrations.

The explosion produced sound and light at the same time.

The table shows the speed of sound in two different materials.

material	Speed of sound (m/s)
air	340
soil	3200

(a) Use all the information above to help you answer parts (i) and (ii) below.

(i) In which order would the pupils notice the explosion?

first second third

(ii) From the information given, calculate the time it would take for the sound to travel through the air to Sylvia.

.....

.....

8P5 Electricity and Magnetism Homework Task 1

Section 1)

1) What is the name given to plants in a food web?

2) Name three essential types of nutrient in a healthy diet

3) State the general word equation of metals reacting with oxygen


4) State the word equation for complete combustion


5) What causes seasons?

6) Describe what makes a material magnetic

Section 2)

Q1) Complete this table:

Symbol	Name	Function
		Measures current in a circuit
	Bulb	Converts electrical energy into light (and heat)

Q2) Complete this paragraph using appropriate key words

When you _____ the voltage on a power pack, you are increasing the potential difference of _____ in the circuit.

This causes the electrons in the circuit to flow _____, and as the flow of electrons is _____, there will be a _____.

Section 3)

Q1) Ani’s phone keeps running out of battery. Her friend suggests that she should keep her screen brightness down to save her battery.
Explain why this may work.

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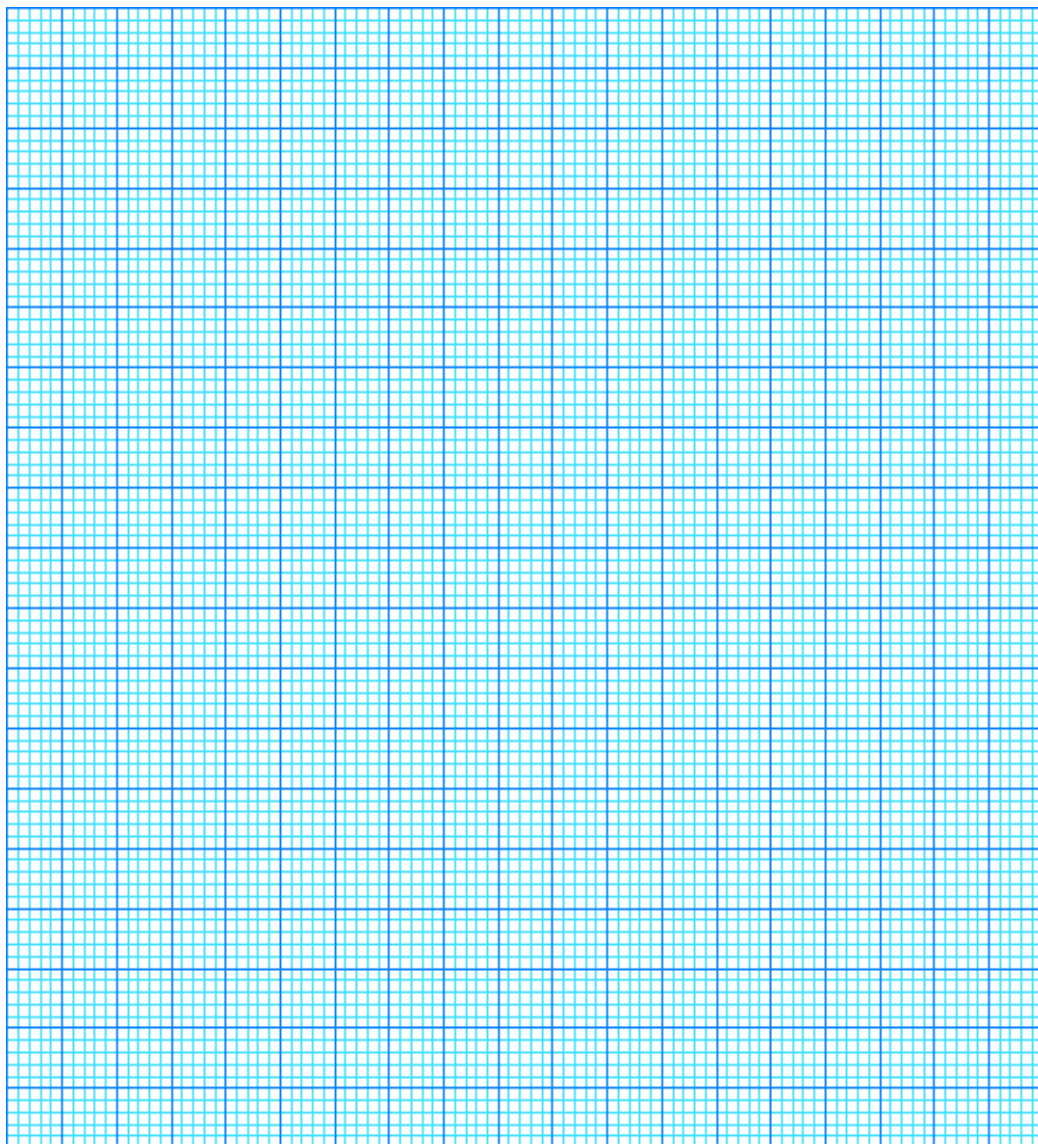
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Q2) Plot this data on the graph below

Power pack voltage (V)	Current (A)
0	0
2	0.1
4	0.2
6	0.25
8	0.4
10	0.5



8P5 Electricity and Magnetism Homework Task 2

Section 1)

1) State the word equation for aerobic respiration

.....

.....

2) What are gametes?

.....

.....

3) State the test for oxygen

.....

.....

4) What is the chemical formulae for magnesium oxide?

.....

.....

5) What is the function of a voltmeter?

.....

.....

6) Recall the equation for pressure.

.....

.....

Section 2) Review of Y7 knowledge: Current in series circuits

A) What happens to current in a series circuit?

.....

B) How do you measure current?

.....

C) What is the unit of current?

.....

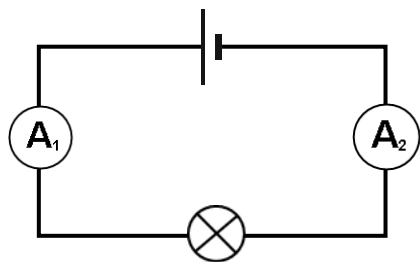
D) What letter is used to represent amps?

.....

E) What would the ammeter readings in a series circuit be?

.....

Look at this diagram

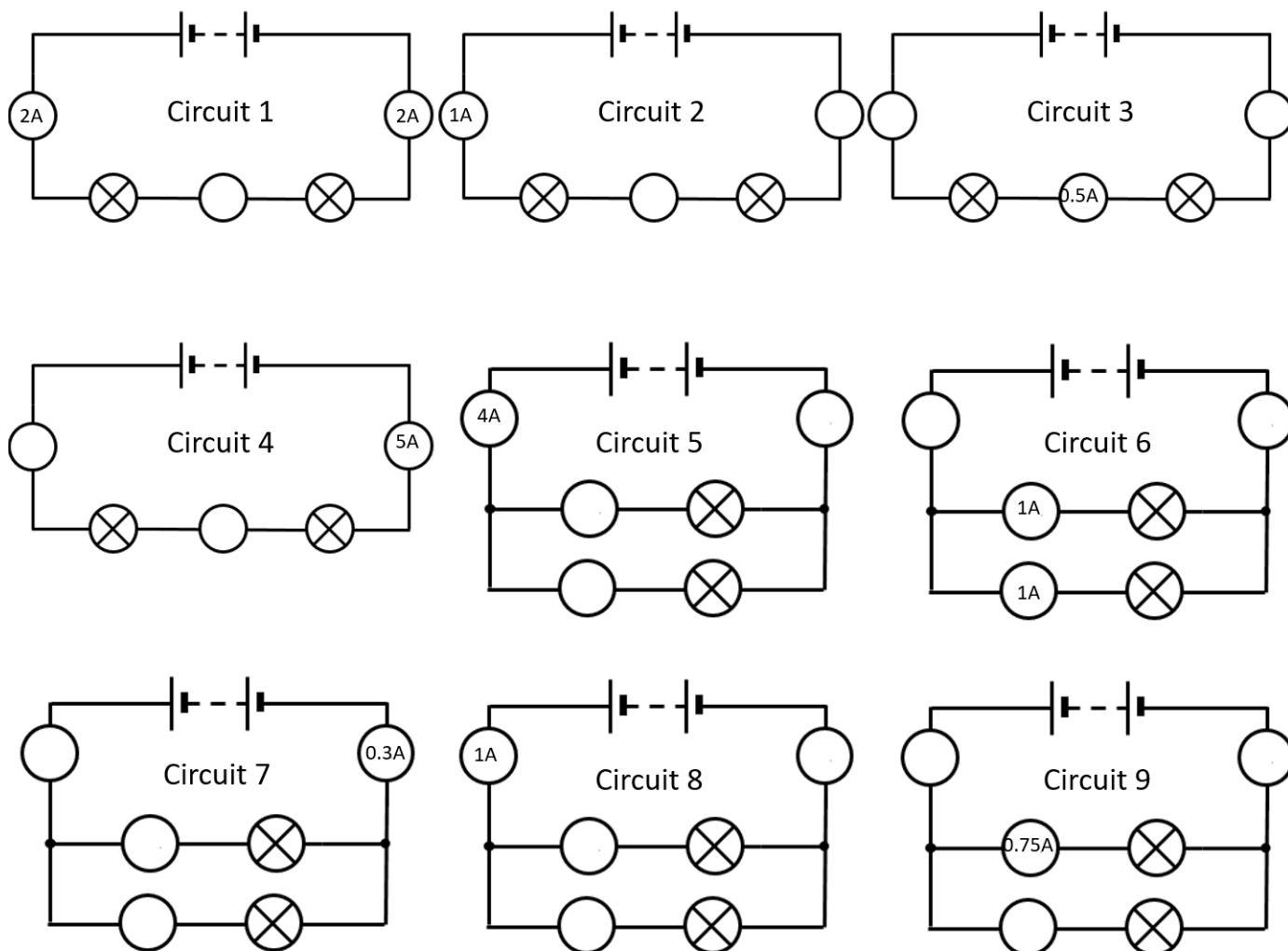


F) If the current at ammeter 1 is 2A then what will the other ammeter read?

.....

Section 3)

Suggest the ammeter readings for these circuits:



8P5 Electricity and Magnetism Homework Task 3

Section 1)

1) What is biodiversity?

2) What are gametes?

3) What type of mixture is separated by distillation?

4) Name the three types of rock in the rock cycle.

5) Compare and explain how sound travels through solid, liquids and gases

6) Define convection.

Section 2)

A) What do we use to measure potential difference?

B) How do we measure potential difference in a circuit?

C) What happens to potential difference in a series circuit?

D) If the potential difference provided is 10V and there are 2 components in the circuit of equal resistance, what will the voltage be across each component?

E) A series circuit is set up with 4 bulbs and a power pack, if each bulb has a potential difference of 2V, what is the potential difference across the power pack?

F) A series circuit is set up with 3 bulbs and a power pack, if each bulb has a potential difference of 4V, what is the potential difference across the power pack?

G) Figure 3 shows two magnetic poles facing each other.

The magnetic field between the poles is uniform.

On Figure 3, draw the magnetic field lines between the two poles and show the direction of this magnetic field. (3)

south pole

north pole

Figure 3

Section 3)

A) Figure 5 shows a magnet holding some paper clips.

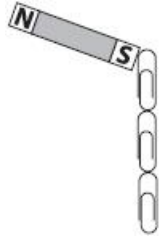


Figure 5

Describe how a student could show that the paper clips are induced magnets. (2)

.....

.....

.....

.....

B) Explain the effect of decreasing the speed of the magnet on the induced current

.....

.....

.....

.....

C) Explain the effect of increasing the strength of the magnet on the induced current

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.....

.....

.....

8P6 Astronomy Homework Task 1

Section 1)

1) Recall the word equation for photosynthesis

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2) How can we test food for starch?

.....

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3) Describe where metals come from

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.....

4) What is the chemical formulae for magnesium oxide?

.....

.....

5) What is the charge and mass of the three subatomic particles?

.....

.....

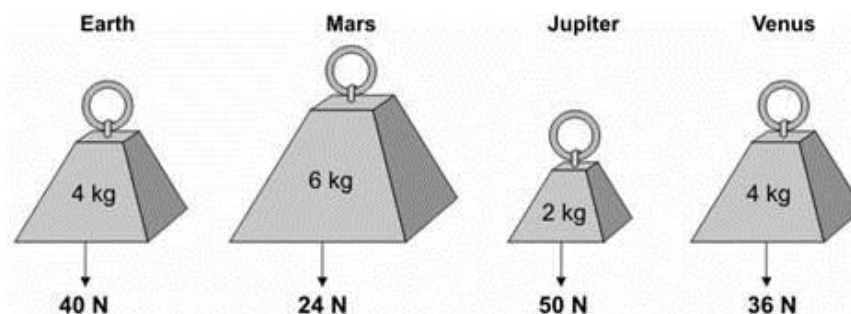
6) Describe a longitudinal wave

.....

.....

Section 2)

The drawings show the mass and weight of four objects on different planets.



(a) On which of the four planets is the object with the largest mass?

.....

1 mark

(b) How can you tell, from the drawings, that gravity is greater on Earth than on Venus?

.....

.....

1 mark

(c) Gravity is less on the Moon than on the Earth.
Complete the sentences below to compare the weight and mass of an astronaut on the Moon and on the Earth.

The **weight** of an astronaut on the Moon is the **weight** of an astronaut on the Earth.

1 mark

The **mass** of an astronaut on the Moon is the **mass** of the astronaut on the Earth.

1 mark

(d) The table below gives information about five planets.

planet	distance from the Sun (million km)	time for planet to orbit the Sun (Earth-years)
Venus	110	0.6
Earth	150	1.0
Mars	230	
Jupiter	780	12.0
Saturn	1400	30.0

(i) Look at the information in the table.

How does the time for a planet to orbit the Sun change with its distance from the Sun?

.....

1 mark

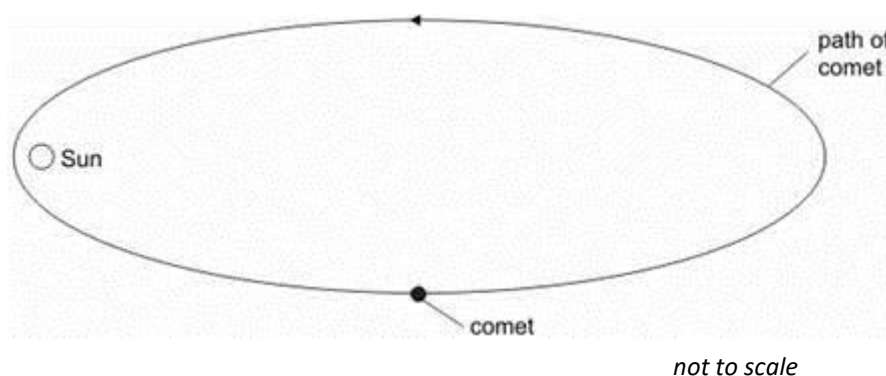
(ii) Use information in the table to estimate the time for Mars to orbit the Sun.

..... Earth-years

1 mark

(e) The diagram below shows the path of a comet around the Sun.

On the path of the comet below, place a letter X to show the position where the comet is travelling the fastest.



1 mark
 maximum 7 marks

8P6 Astronomy Homework Task 2

Section 1)

1) What are chromosomes?

.....

2) State some changes that occur during puberty in boys.

3) Describe the disadvantages of burning fossil fuels

4) What is a period on the period table?

5) Define the term galaxy

6) Define friction

Section 2)

Observe the night sky from your bedroom window, garden, or if your carer can take you somewhere really dark at night- you will see more where there is less light pollution.

Describe what objects you could see in the night sky.

It could include a sketch of the moon, a constellation or perhaps if you've used a telescope- a planet.

Section 3)

A. How long ago did our solar system start forming?

B. What did the solar system form from?

C. How did the nebula form a star?

D. What pulls the gas and dust together?

E. How did the planets form?