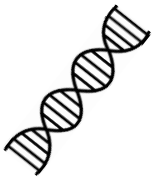
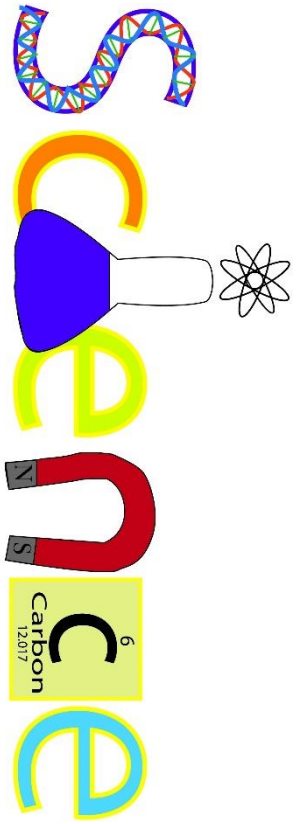
Year 8 Homework Booklet

Name : .....

Class & Teacher : .....



Homework number	Date set	Date to be handed in	Completed?



How to use this booklet:

- **Section 1** contains core knowledge questions. You can use your core knowledge booklet or class workbooklet to get a perfect answer.
- **Section 2** reviews your knowledge of this topic from the work you have done in class.
- **Section 3** contains exam style questions for this topic.

Homework task 1 -8B1 Cells and Body Systems

Section 1: Review of prior knowledge

1. What is the function of the nucleus?

2. Draw and label a typical plant cell

3. Define solute

4. What type of salt does hydrochloric acid produce?

5. Describe how static electricity is generated

6. State the equation for calculating speed

Section 2: Refreshing current knowledge

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

……

……

……

2) Name one food that is high in each nutrient

……

……

……

……

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

……

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……

……

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.

……

……

Homework task 2 – 8B2 Respiration

Section 1: Review of prior knowledge

1. What is Anaerobic respiration in humans?

……

……

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

……

……

3. What is an oxygen debt?

……

……

4. What is ventilation (breathing)?

……

……

5. How do molecules move through cytoplasm?

……

……

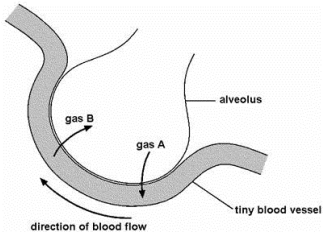
6. How can we describe the cell membrane?

……

……

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?

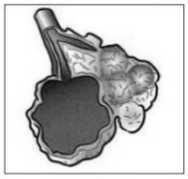
gas A ..... gas B .....1 mark

(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?

..... and 1

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

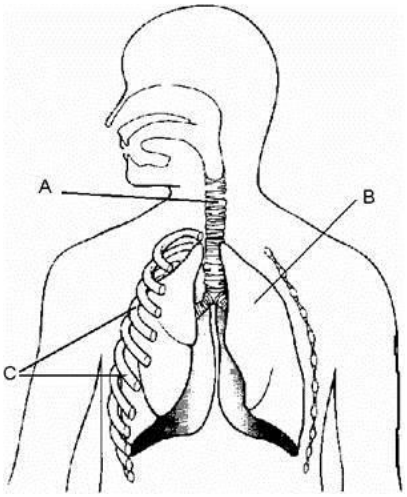
.....

.....1

2)

The diagram below shows an organ system in the human body.

(a) What is the name of the organ system shown in the diagram?



(b) What are the names of parts A and B?

part A .....

part B .....

Homework task 3 - 8B3 Genetics

Section 1: Review of prior knowledge

1. How are forces represented on diagrams?

2. Define friction.

3. What is respiration?

4. How do like charges interact?

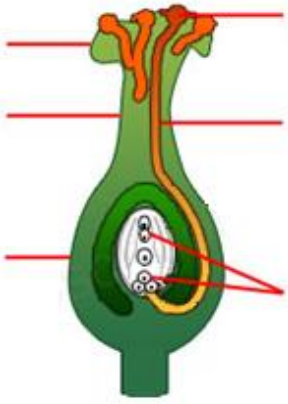
5. Describe the particle arrangements for a solid

6. What is the definition for an atom?

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)

.....

.....

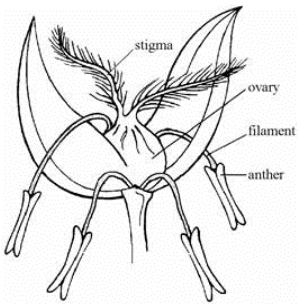
3) How many chromosomes does a zygote have? Is it haploid or diploid? (2 marks)

.....

.....

Section 3: Application of knowledge

The drawing shows a single flower of rye grass.



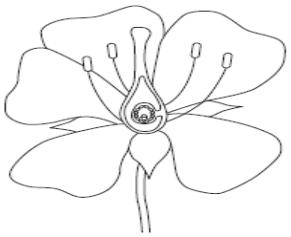
(a) Rye grass flowers are adapted for wind pollination.
Explain how **two** features, shown on the drawing, show that the flower is adapted for wind pollination.

(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)

.....

.....

.....

.....

.....

.....

Homework task 4 – 8B4 Plants and Photosynthesis

Section 1: Review of prior knowledge

1. What is the function of the nucleus?

.....

2. What is the function of the cytoplasm?

.....

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

.....

4. State colour of an acid in universal indicator

.....

5. What is the equation for calculating speed?

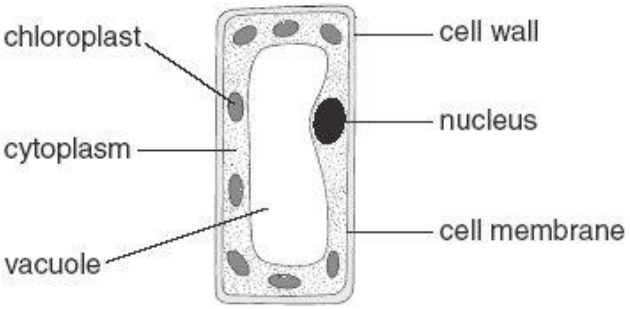
.....

6. What are the SI units for distance?

.....

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)

.....

(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)

.....

.....

(c) Tick **one** box in each row to show whether the statement is true for

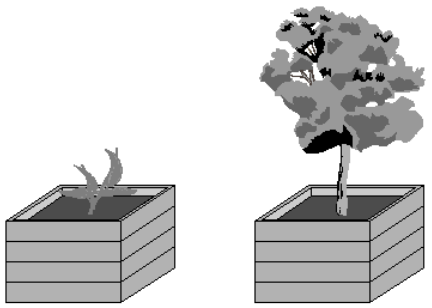
photosynthesis **or** for respiration.

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.



at the start five years later

	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)

.....

.....

Homework task 5 - 8C1 Atoms and Periodic Table

Section 1: Review of prior knowledge

1. What is biodiversity?

.....

.....

2. What is digestion?

.....

.....

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

.....

.....

4. What is a compound?

.....

.....

5. How is weight calculated?

.....

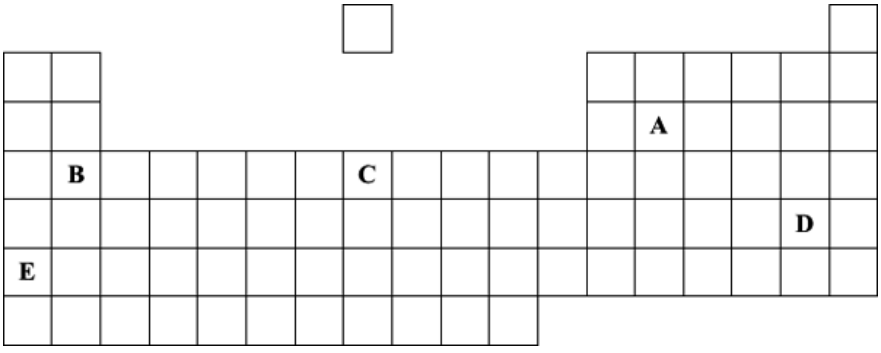
.....

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

.....

.....

Q1. (a) The periodic table on the Data Sheet may help you to answer these questions. Part of the periodic table is shown below. The letters are **not** the symbols of these elements.



Choose your answers **only** from the letters shown in the periodic table above.

Which letter, **A**, **B**, **C**, **D** or **E**, represents:

1) An alkali metal ……..

2) The element calcium ……

3) A transition element ……

4) A group 4 element ……..

(b) A chemistry teacher demonstrated the reaction between sodium and water to some students. One of the students wrote the following notes.

The reaction between sodium and water

A piece of sodium was cut easily into smaller pieces with a knife.

The sodium was added to water in a trough.

The sodium:
- floated
- melted quickly to give a silvery ball
- moved on the surface of the water
- fizzed.

Use the information in the box to help you to answer these questions.

What evidence is there that:

(i) sodium has a low melting point

_____ (1)

(ii) sodium is soft

_____ (1)

(iii) a gas was produced?

_____ (1)

(1)

(Total 7 marks)

Q2. (a) How many different elements are in the formula $AgNO_3$? Tick **one** box.

2 ☐ 3 ☐ 5 ☐ 6 ☐

(1)

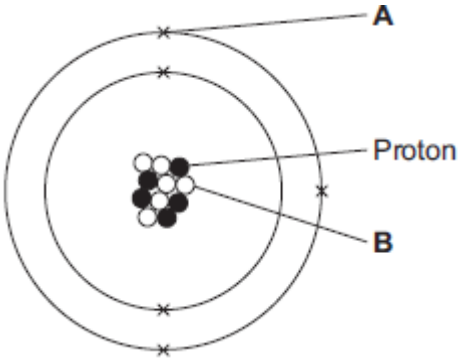
(b) How many atoms are in the formula $AgNO_3$? Tick **one** box.

2 ☐ 3 ☐ 5 ☐ 6 ☐

(1)

Q3.

(a) **Figure 1** shows an atom of element **G**.



Draw a ring around the correct answer to complete each sentence.

(i) Label **A** shows

an electron **an ion** **a nucleus**

(1)

(ii) The particle labelled **B** is

an isotope **a molecule** **a neutron** **(1)**

Homework task 6 - 8C2 Particle Theory

Section 1: Review of prior knowledge

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

……

……

2. How can we test for starch?

……

……

3. Define the mass number

……

……

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

……

5. Define friction.

……

……

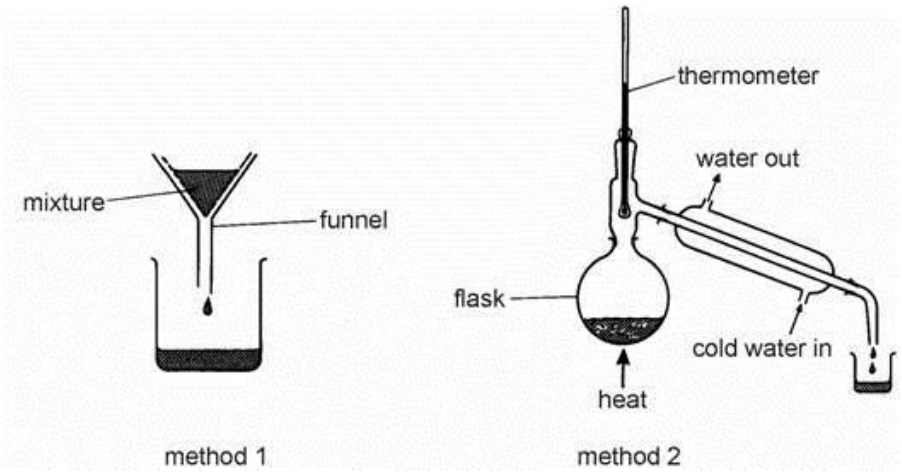
6. How does pressure vary with depth?

……

……

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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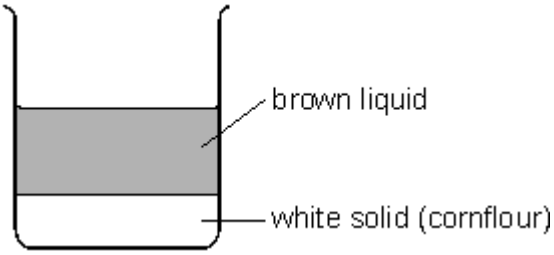
Section 3: Application of knowledge

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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Homework task 7 – 8C3 Chemical Reactions

Section 1: Review of prior knowledge

1.

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

2.

Define 'chemical reaction' using ideas about atoms and their arrangements.	

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 *reactants* during a chemical reaction.	

5.

How would the temperature around an *exo*thermic reaction change?	

6.

In an exothermic reaction, which step involves the higher amount of energy? Breaking the chemical bonds in the reactants or making the chemical bonds in the products?	

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?

.....

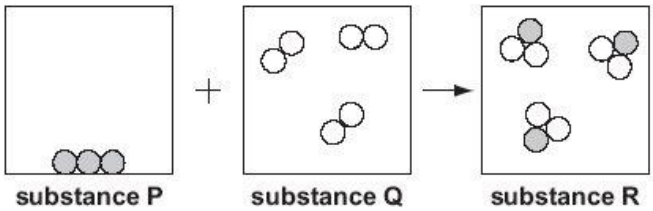
5. A reaction happens where more energy is taken in to break bonds between atoms in the reactants than the energy that is given out when bonds are formed between atoms in the products. Is this reaction exothermic or endothermic?

.....

Section 3: Application of knowledge

Q1. 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)

Q2. A student writes a symbol equation (shown below) but they have forgotten to balance it. Finish the equation by balancing it for them.

$$.....Mg(OH)_2\ (aq) + ...HBr\ (aq) \rightarrow .....MgBr_2\ (aq) + ...H_2O\ (l)$$

Q3. Another unbalanced symbol equation is shown below. Balance it.

$$.....C_2H_4\ (g) + ...O_2\ (g) \rightarrow .....CO_2\ (g) + ...H_2O\ (g)$$

Homework task 8 – 8C4 Earth Science

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	☐	calcium chloride	☐
calcium nitrate	☐	calcium sulphate	☐

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?

.....

Homework task 9 – 8C5 Metals

Section 1: Review of prior knowledge

1How can we test foods for sugar?

_____

2 Why do cells perform mitosis?

_____

3 Define the atomic number

_____

4 What is freezing?

_____

5 What instrument is used to measure temperature?

_____

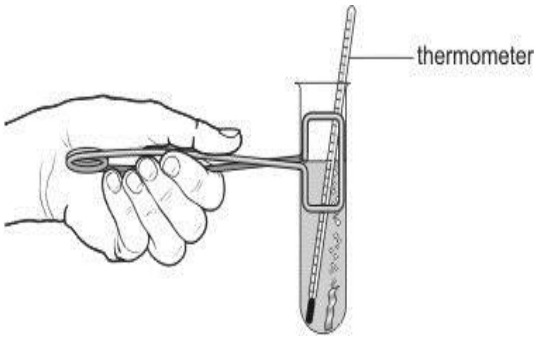
6 What are the units for temperature?

_____

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.

The word equation for the reaction is shown below



zinc + copper sulphate → zinc sulphate + copper

Why is this reaction called a displacement reaction?

.....

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.....

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	

Homework task 10 – 8P1 Forces and Motion

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 .....
   e) 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.

.....

.....

.....

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

A)

B)

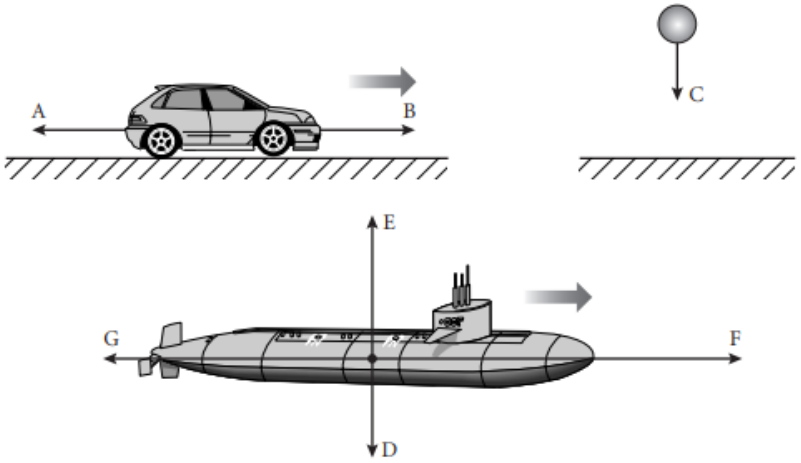
C)

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.

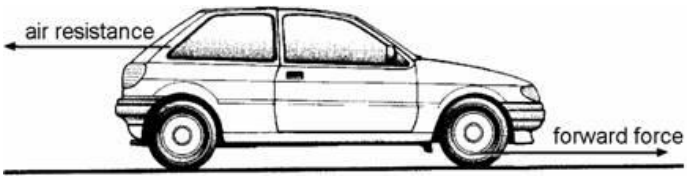
CAR.....

BALL.....

SUBMARINE.....

Section 3: Application of knowledge

Q. 1 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

Homework task 11 – 8P2 Energy

Section 1: Reviewing prior knowledge.

1) What is the unit of force?

……

2) What instrument is used to measure force?

……

3) Name three organelles found exclusively in plant cells.

……

4) Describe the function of the mitochondria.

……

5) What are the products of complete combustion?

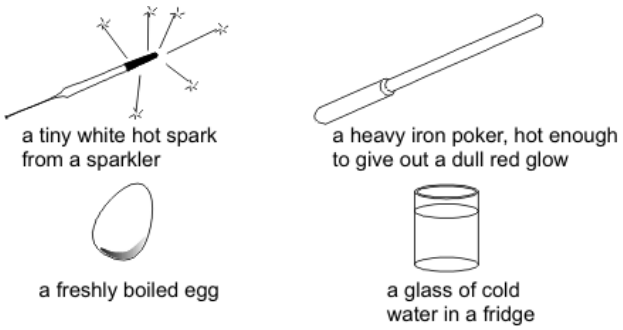
……

6) What is the product of a reaction between zinc and copper sulphate?

……

Section 2 Review of current knowledge.

(a) Each of the four objects shown started at room temperature.
Now they are all at different temperatures, as described by the labels.



(i) Which object is at the highest temperature?

……

(ii) Which object has lost thermal energy?

.....

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

.....

(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?

.....

.....

1 mark

Section 3 Applied Knowledge

Q1. (a) The diagrams below show how much heat is lost from different parts of a house every second.

Through which part of the house above is most heat lost?

.....

(b) Part of the house is insulated to reduce the loss of heat.

Which part of the house has been insulated?

…….....

Homework task 12 – 8P3 Electricity

Section 1: Reviewing prior knowledge

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

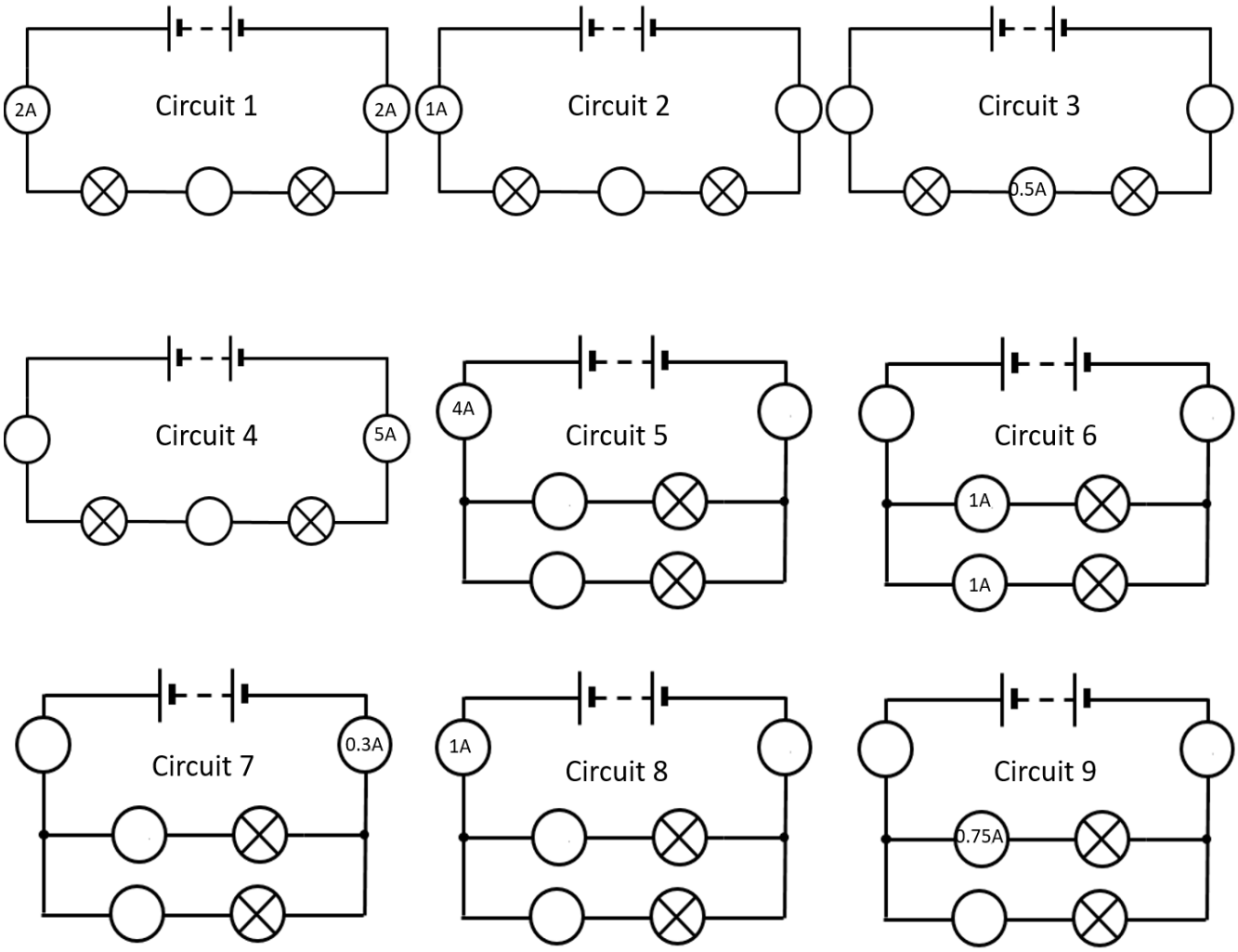
difference of _____in the circuit.

This causes the electrons in the circuit to flow _____, and as the flow of electrons is

_____, there will be a _____ _____.

Section 3)

Suggest the ammeter readings for these circuits:



Homework task 13 - 8P4 Waves

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?

.....

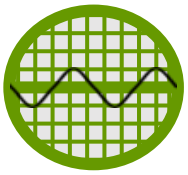
5. How do you calculate relative motion if two objects are moving in opposite directions?

.....

Section 2: Refreshing current knowledge

1)

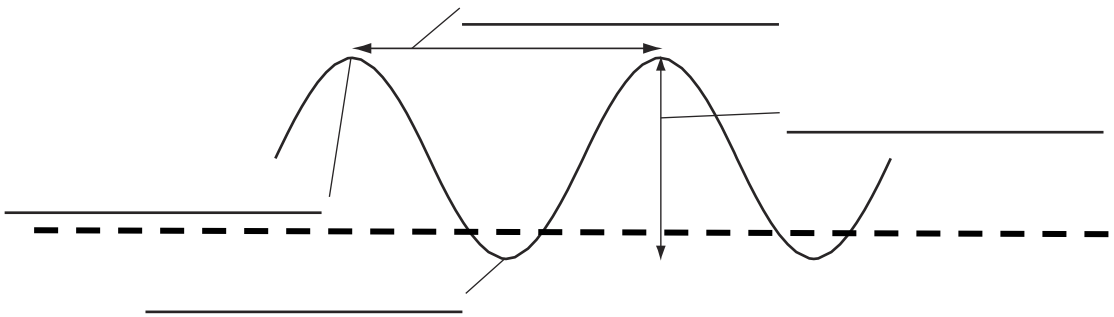
A



B

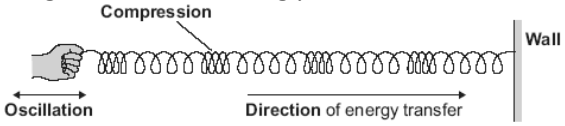
Which trace, A or B, represents the loudest sound?

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

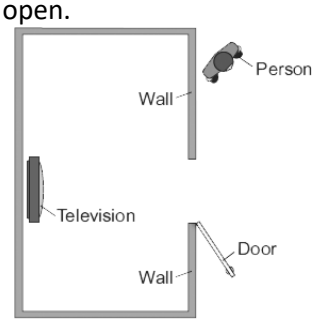
…….. of energy transfer.

4) List at least three uses of sound waves.

……

Section 3: Application of knowledge

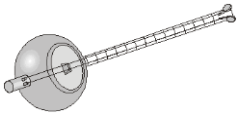
1)) A television is switched on inside a room. A person outside the room can hear the television, but only when the door is open.



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?

……

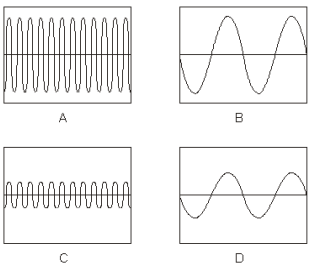
……

……

(d) Aftal played the dotar near a microphone connected to an oscilloscope. The diagram 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?



Homework task 14 – 8P5 Astronomy

Section 1) Reviewing prior knowledge

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

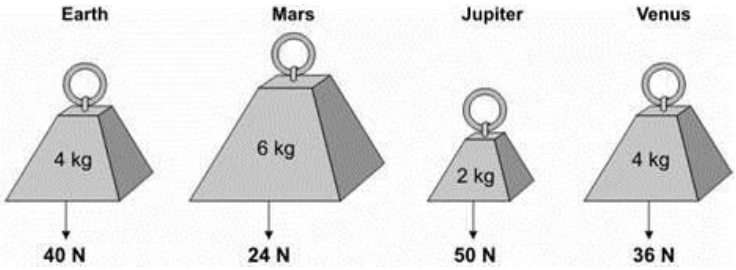
.....

6) Define friction

.....

Section 2) Refreshing current knowledge

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

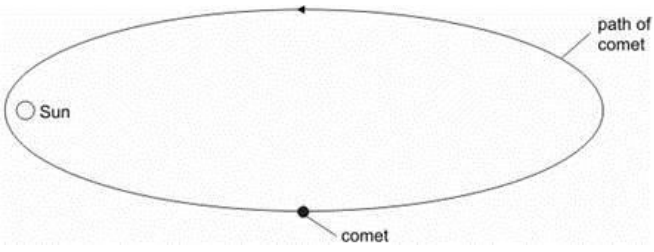
(ii) Use information in the table to estimate the time for Mars to orbit the Sun.

..... 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.



not to scale