

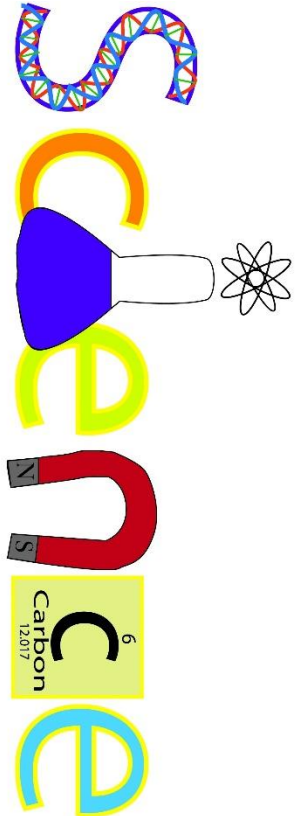
# Year 7 Homework Booklet

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 = 7B1 Cells and Body Systems

### Section 1: Review of prior knowledge

1. What is a cell?

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.....

2. Name 3 things you'd find in all plant and animal cells.

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3. What is the function of the nucleus?

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4. What is the function of the cytoplasm?

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.....

5. What is the function of the cell membrane?

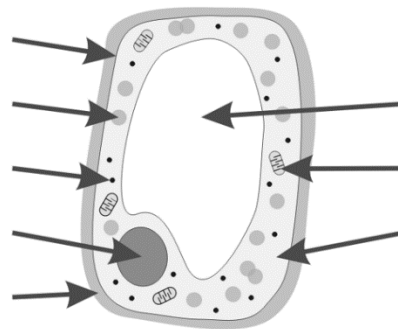
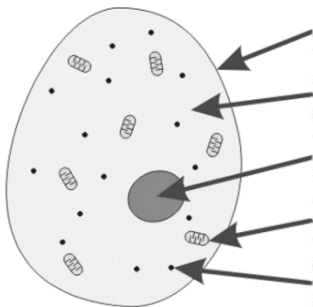
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6. What is the function of the chloroplasts in plants?

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### Section 2: Refreshing current knowledge

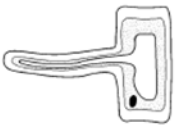



1) Label these cells



4) What is the job of the mitochondria in cells?

**Section 3: Application of knowledge**

Draw lines to match up the cell, its job and the adaptation.

Cell	Job	Link
 root hair cell	deliver oxygen around body	'Hair like' structure: increases surface area
 sperm cell	absorb water from the soil	No nucleus, so it has an increased surface area
 Red blood cell	it carries signals around the body	Tail helps it swim, lots of mitochondria for energy
 Neuron	fertilise the ovum (egg) cell	Very long cells so that signals can be carried quickly around the body

## Homework task 2 - 7B2 Respiration

### Section 1: Review of prior knowledge

1. What are the key features of diffusion?

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.....

2. What happens when a gas reaches equilibrium?

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3. What is the relationship between surface area of a membrane and the rate of diffusion?

.....

.....

4. How are the alveoli adapted to maximise rates of diffusion?

.....

.....

5. What is the composition of inhaled air?

.....

.....

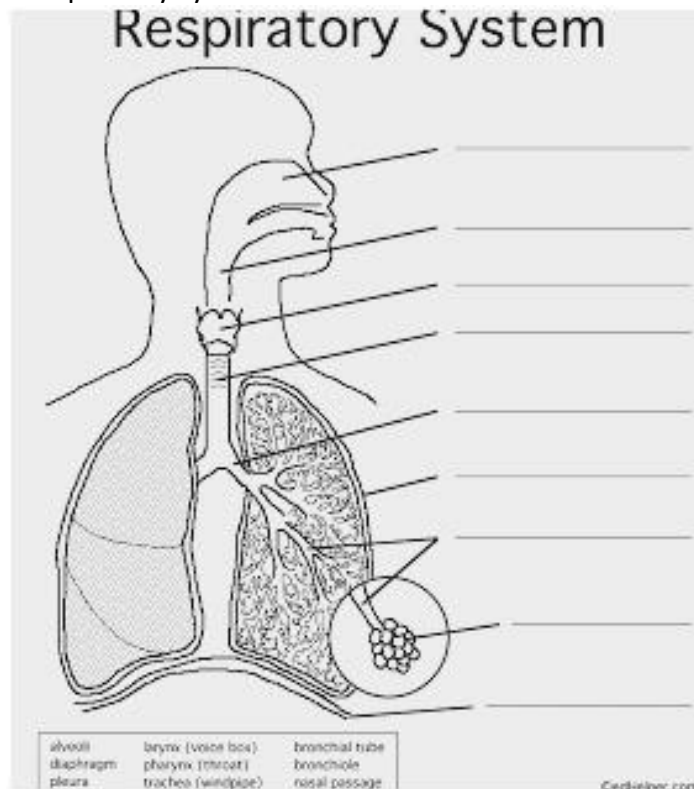
6. What is the composition of exhaled air?

.....

.....

### Section 2: Refreshing current knowledge

1) Label the diagram of the respiratory system



2) 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

3) How is oxygen transported around the body?

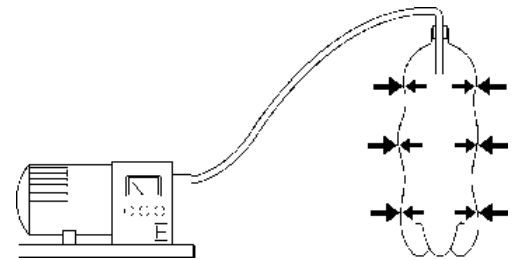
- A carried on red blood cells
- B as a gas
- C carried on white blood cells
- D attached to glucose

4) 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.

5) The air is being sucked out of this bottle. Why is it collapsing?

- A There is more air pressure inside than outside.
- B There is more air pressure outside than inside.
- C There are more particles inside it.
- D Air particles are sticking to the walls and pulling them in.



**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

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

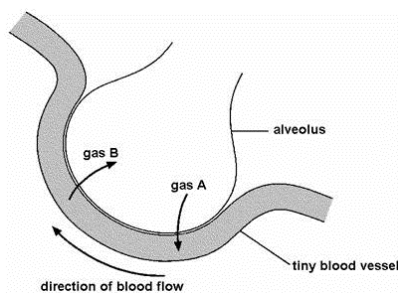
(i) Which **two** gases are exchanged at this surface of the air sac?

..... and ..... (1)

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

..... (1)

2. 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)

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

..... (1)

## Homework task 3 – 7B3 Genetics

### Section 1: Review of prior knowledge

1. What is the function of the vacuole in plants?
2. How is an egg cell adapted to its function?
3. How is a sperm cell adapted to its function?
4. How long does pregnancy last in humans?
5. How often does a woman release an egg cell and when does ovulation usually happen?
6. How do food, water and oxygen reach the growing baby?

### Section 2: Refreshing current knowledge

Draw lines to link each term with its definition.

#### Terms

ovulation

fertilisation

menstruation

contraception

#### Definitions

when the unfertilised egg and part of the uterus lining are shed from the body

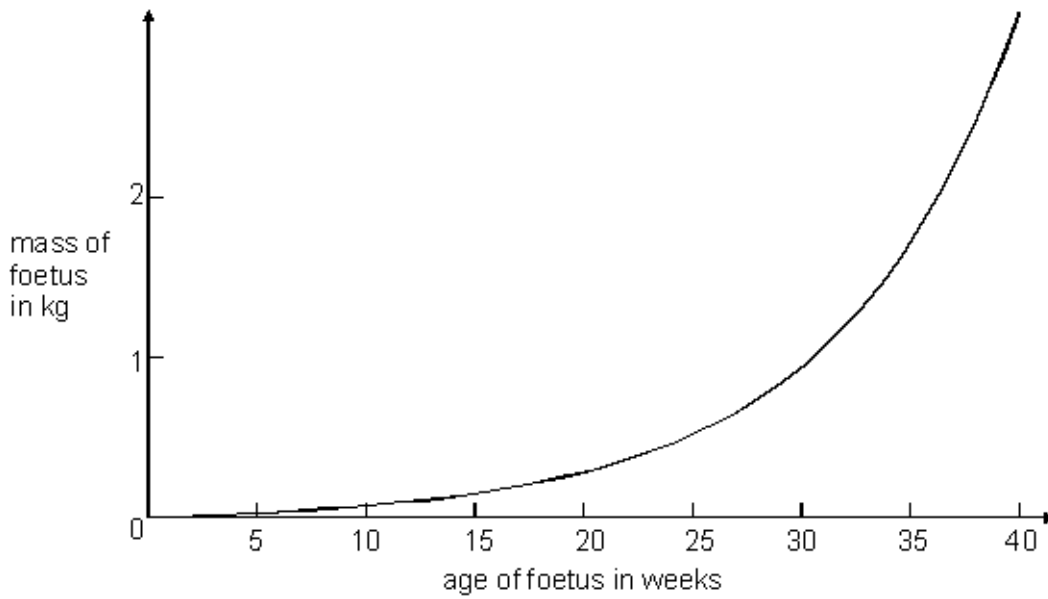
when an egg is released from an ovary

prevention of **pregnancy**

when a sperm cell fuses with an egg

### Section 3: Application of knowledge

1) The graph below shows how the mass of a human foetus increases during the 40 weeks of pregnancy.



a) In which five-week period on the graph does the mass of the foetus increase most rapidly?

.....  
.....

b) Describe the relationship between the age of the foetus and the mass of the foetus.

.....  
.....  
.....  
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.....  
.....

2) The foetus needs oxygen but cannot breathe while it is in the uterus.  
Describe how oxygen gets from the air to the cells of the foetus.

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## Homework task 4 – 7B4 Ecosystems

### **Section 1: Review of prior knowledge**

1. What is the function of the nucleus?

.....  
.....

2. What is the function of the cytoplasm?

.....  
.....

3. What is the function of the cell membrane?

.....  
.....

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

.....  
.....

5. What is the equation for calculating speed?

.....  
.....

6. What are the SI units for distance?

.....  
.....

### **Section 2: Refreshing current knowledge**

1. What is the difference between an ecosystem and a habitat?

.....  
.....

2. Give 2 examples of how human activity can effect ecosystems

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.....  
.....  
.....



3. What is an abiotic factor? State some examples of abiotic factors

.....

.....

.....

4. What is a biotic factor? State some examples of biotic factors

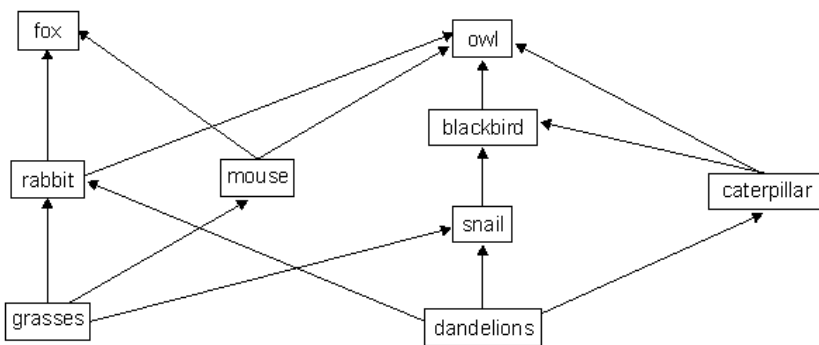
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### Section 3: Application of knowledge

The diagram below shows part of a grassland food web.



(a) One year the snail population increased in the grassland area.

How could an increase in the number of snails cause the caterpillar population to **increase**?

.....

.....

.....

(b) A scientist wants to record the number of dandelion plants in the grassland area.

Describe how they could use a 1m<sup>2</sup> quadrat to estimate the number of dandelions growing in the grassland area.

.....

.....

.....

## Homework Task 5 – 7C1 Atoms and the Periodic Table

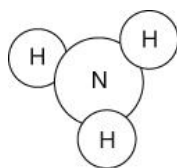
### Section 1: Review of prior knowledge

1. What is an atom?
2. What is an element?
3. Where do we find metals on the periodic table?
4. What are the columns of the periodic table called?
5. What are the rows of the periodic table called?
6. Who designed the modern periodic table?

### Section 2: Refreshing current knowledge

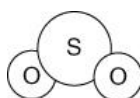
Write the formula for each of these particle drawings

**a**



ammonia

**b**



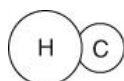
sulfur dioxide

**c**



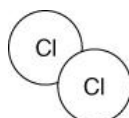
hydrogen peroxide

**d**



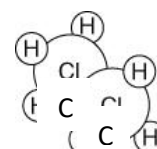
carbon monoxide

**e**



chlorine

**f**

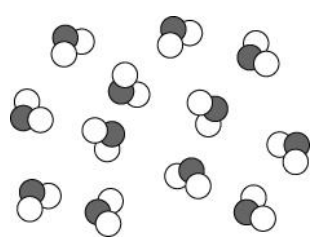


ethane

### Section 3: Application of knowledge

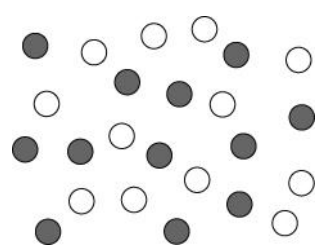
Tick the correct boxes to classify each substance shown in the particle drawings below.

**1**



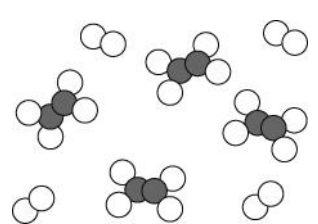
pure  
 mixture  
 element  
 compound

**2**



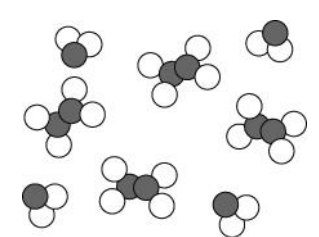
pure  
 mixture  
 element  
 compound

**3**



pure  
 mixture  
 element  
 compound

**4**



pure  
 mixture  
 element  
 compound

1 Read the following passage then answer the questions which follow.

‘When the shiny lithium metal is heated and lowered into a container of green chlorine gas, a chemical reaction occurs. The lithium appears to burn and a white solid forms on the sides of the container. The white solid is lithium chloride.’

**a** Name the elements and the compound described in the above passage.

Elements: \_\_\_\_\_

Compound: \_\_\_\_\_

**b** Describe *one* difference in property between the elements and the compound they form.

\_\_\_\_\_

**c** What evidence is there for a chemical reaction occurring?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2 What is the difference between a mixture of elements and a compound?

\_\_\_\_\_

3 What elements are in the compound copper oxide?

\_\_\_\_\_

## Homework task 6 – 7C2 Particles

### Section 1: Review of prior knowledge

1. How are the particles arranged in a gas?
2. How are the particles arranged in a liquid?
3. How are the particles arranged in a solid?
4. Describe Brownian motion in gases
5. What is concentration ?
6. What is kinetic energy?

### Section 2: Refreshing current knowledge

**Q1.** (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.

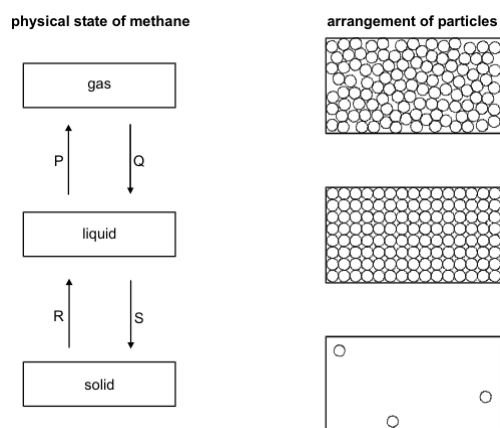
Draw only **three** lines.

(ii) Arrows P, Q, R and S represent changes of state.

Which arrow represents:

evaporation? .....

melting? .....



**Q2.** Solids, liquids and gases have different properties and different uses. Some of these are described in the table.

Tick either **one** or **two** boxes in each row to show whether a solid, liquid or gas matches the description in that row.

property or use	solid	liquid	gas
it is used to build rigid or stiff structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
it flows easily through a pipe or tube	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
it can be squeezed into a much smaller volume	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3. 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.

Ice is more dense than water.

Ice and water have the same density.

Ice is less dense than water.

Ice has a density of zero.

1 mark

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

Tick the box by the correct statement.

The molecules are further apart in ice than in water.

The molecules are the same distance apart in ice and in water.

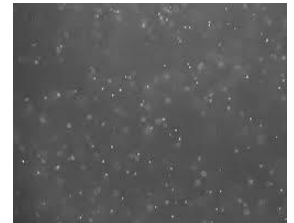
The molecules are closer together in ice than in water.

1 mark

Maximum 5 marks

### Section 3: Application of knowledge

Q1. **Brownian Motion:** This image shows smoke particles moving in an erratic way. This is caused by Brownian motion



- A) What states can Brownian motion occur in?

\_\_\_\_\_ (2 marks)

- B) The bright dots represent smoke particles. What causes them to move in an erratic way? (2 marks)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- C) What would happen to the speed of the movements if you heated the smoke cell up? (1 mark)

\_\_\_\_\_

## Homework task 7 – 7C3 Chemical Reactions

### Section 1: Review of prior knowledge

1.

What are the three states of matter?	
--------------------------------------	--

2.

What is a mixture?	
--------------------	--

3.

What is a particle?	
---------------------	--

4.

Describe diffusion of particles in gases and liquids	
--	--

5.

Explain why gases and liquids can diffuse	
---	--

6.

What is kinetic energy?	
-------------------------	--

### Section 2: Refreshing current knowledge

1) What must go in the **middle** of a chemical word equation?

- A an arrow pointing right ( $\rightarrow$ ).
- B an arrow pointing left ( $\leftarrow$ ).
- C an equals sign.
- D the phrase 'atoms get rearranged'.

2) What are the chemicals on the left-hand side of a chemical word equation called?

- A solutes
- B solvents
- C reactants
- D products

3) What are the chemicals on the right-hand side of a chemical word equation called?:

- A solutes
- B solvents
- C reactants
- D products

4) What can be written after the name of a chemical in an equation to show that it was dissolved in water?

- A (s)
- B (l)
- C (g)
- D (aq)

5) State the law of conservation of mass:

.....  
.....  
.....

**Section 3: Application of knowledge**

1) Henrietta measures the mass of a piece of solid magnesium metal. She slowly heats the magnesium in the air and observes that it changes colour from a solid silver ribbon to a crumbly white solid. She records the mass again. Her results are shown in the table below.

<b>Mass of magnesium at the start (g)</b>	<b>1.52</b>
<b>Mass of magnesium substance at the end (g)</b>	<b>2.53</b>

a) Calculate the change in mass

..... g

b) Suggest why the change in mass occurred

.....  
.....  
.....

c) What signs were there that a chemical reaction occurred?

.....

d) Henrietta correctly figured out that she no longer had pure magnesium at the end of the reaction.

Suggest a name for the new substance that had been made during the reaction

.....

e) Suggest a word equation, including state symbols, for the chemical reaction that took place.

.....

## Homework task 8 – 7C4 Earth Science

### 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 periodic table are the halogens found?

.....

4 Where on the periodic 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.

.....

.....



**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.

.....  
.....

## Homework task 9 – 7C5 Metals

### 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.

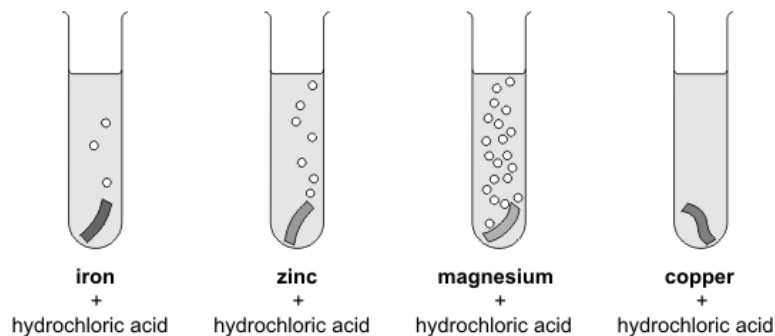
.....

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 cm<sup>3</sup> 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.

	<b>lithium</b>	<b>sodium</b>	<b>potassium</b>
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<sub>2</sub>O, to form magnesium oxide, MgO, and hydrogen.

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

.....

.....

## Homework Task 10 – 7P1 Forces and Motion

### Section 1: Review of prior knowledge

1. What is the function of the cell membrane?

.....  
.....

2. State an example where friction is useful.

.....  
.....

3. In chemistry, what does the word "product" mean?

.....  
.....

4. What is an element?

.....  
.....

5. Give the formula for oxygen?

.....  
.....

6. What is a diatomic molecule?

.....  
.....

### Section 2: Refreshing current knowledge

1) Name the unit and symbol for force

.....  
.....

2) What would the motion of an object be if the forces weren't balanced?

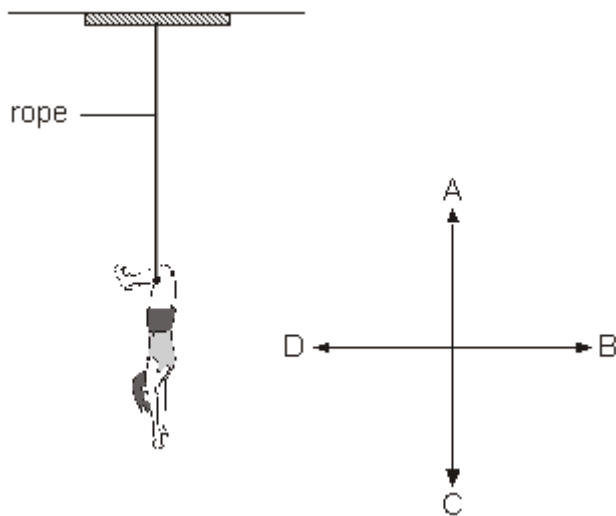
.....  
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3) What would be the motion of an object be if the forces were balanced?

.....  
.....

### Section 3: Application of knowledge

Q1) The diagram below shows Jo hanging on a trapeze (swing) in a circus.



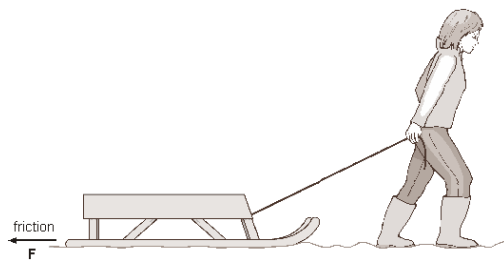
(a) (i) Which arrow, A, B, C or D, shows the direction of Jo's weight?

.....

(ii) Which arrow, A, B, C or D, shows the direction of the force of the rope on Jo?

.....

Sally pulls a sledge in the snow.



(b) (i) Draw an arrow on the rope to show the direction of the force of the rope on the sledge

Label the arrow **R**. (ii) Draw an arrow on the diagram to show the direction of the force of gravity on the sledge.

Label the arrow **G**.

## Homework task 11 – 7P2 Energy

### Section 1: Review of prior knowledge

1. State the test for hydrogen.

.....  
.....

2. Name the unit and symbol for force.

.....

3. State some changes that occur during puberty in males.

.....  
.....

4. State some changes that occur during puberty in females.

.....  
.....

5. Give the formula for sulphur dioxide.

.....  
.....

6. What is respiration

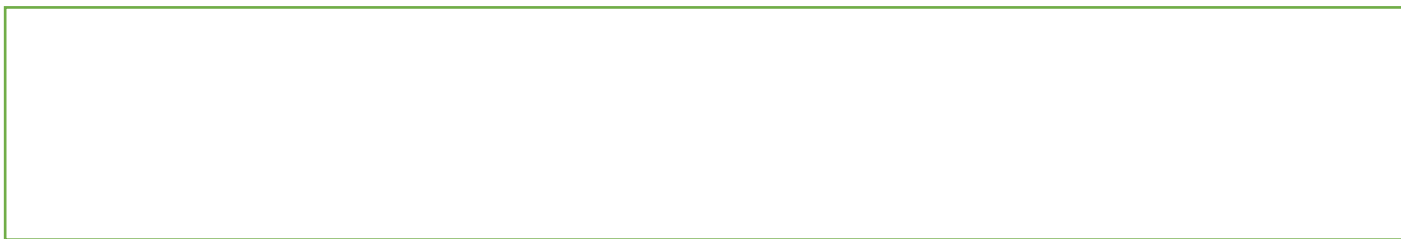
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### Section 2: Refreshing current knowledge

Q1) Name the 9 forms of energy

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Q2) Draw an energy transfer diagram for a battery powered torch.



Q3) Explain what is meant by waste energy

.....

.....

.....

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### Section 3: Application of knowledge

A motor in a remote controlled car transfers 300J of energy into the car's energy stores. 225 J are transferred to the car's kinetic energy stores. Kinetic energy is related to the motion of the car and is a useful energy.

Q1) Calculate how much of the input energy is wasted to thermal energy (due to friction):

.....

.....

.....

Q2) Describe a method that could be used to reduce the amount of energy lost due to friction.

.....

.....

.....

Q3) Explain why it is important for that people try to reduce the amount of energy lost as waste.

.....

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.....

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## Homework task 12 – 7P3 Electricity

### Section 1: Review of prior knowledge

1) What is an organ?

.....  
.....

2) What are the components of blood?

.....  
.....

3) What is a compound?

.....  
.....

4) State the test for oxygen

.....  
.....

5) What is the equation to calculate speed?

.....  
.....

6) Name 9 forms of energy

.....  
.....

### Section 2: Refreshing current knowledge

1) Most atoms contain electrons, protons and neutrons. Describe the positions of these particles in atoms.

.....  
.....

.....  
.....

2) Draw a diagram to illustrate the structure of metals



### Section 3: Application of knowledge

1) Describe the structure of a metal

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.....

.....

.....

2) Explain why metals can conduct electricity

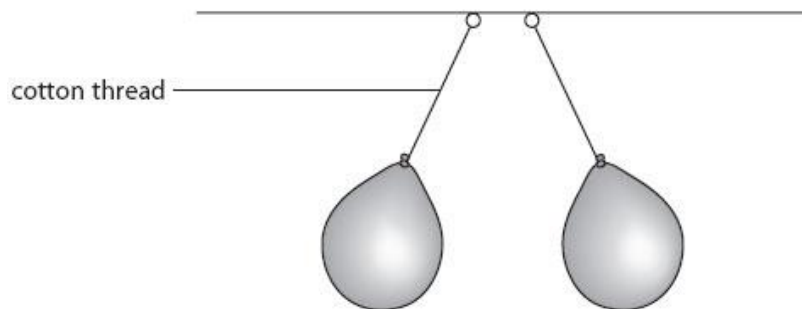
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3) A student charges two balloons and hangs them side by side.



4) Explain why the cotton threads are not vertical.

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The student rubs another balloon with a cloth. This balloon becomes negatively charged.

5) Explain why the balloon became negatively charged when it was rubbed with the cloth.

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## Homework task 13 – 7P4 Waves

### Section 1: Review of prior knowledge

1. What is the function of the nucleus?

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2. What is an organ?

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3. What is diffusion?

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4. What are the three states of matter?

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.....

5. List three common speeds

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6. What is a vector quantity? Give an example.

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### Section 2: Refreshing current knowledge

1. What is a wave?

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.....

2. Name the two types of wave motion. Give an example of each.

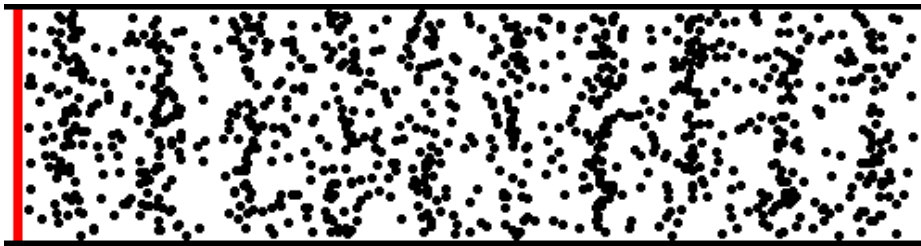
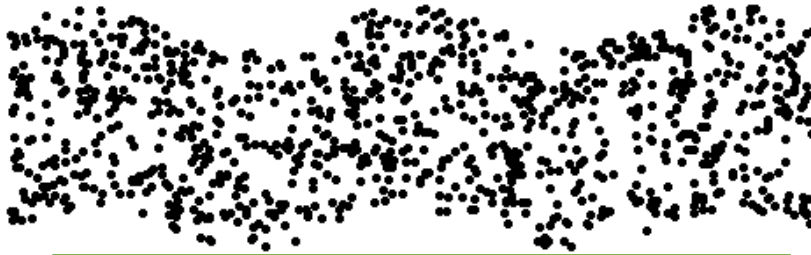
.....  
.....

3. Explain how all waves are similar.

.....  
.....

### Section 3: Application of knowledge

1. Correctly identify the types of wave motion shown below.



For each statement, decide whether it refers to water waves, sound waves, or both

Example: Particles move at right angles to the way the wave is moving (*water only*)

1. Can be reflected
2. Particles move in the same direction as the wave is moving
3. Can involve solids, liquids or gases
4. Transverse wave
5. Spreads out from source in all directions
6. Amplitude of wave decreases with distance from source
7. Transfers energy
8. Transfers matter
9. Longitudinal wave

## Homework task 14 – 7P5 Astronomy

### Section 1: Review of prior knowledge

1) Describe the structure of DNA

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2) What is a zygote?

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3) Give the formulae for these common laboratory substances:

a) Hydrochloric acid

b) Sulphuric acid

c) Nitric acid

d) Sodium hydroxide

4) Describe how to test for carbon dioxide

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5) Describe how objects can interact at a distance

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6) Draw an energy transfer diagram for stretching a spring

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### Section 2: Refreshing current knowledge

Define the following terms:

The Universe

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Galaxy

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## Solar System

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What is our sun an example of?

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### Section 3: Application of knowledge

Draw a postcard designed to be from one of the planets in our solar system.

You must include the following information on the front of the postcard:

- Its day length
- Its temperature (this may be a range)
- Its year length
- Its distance from the sun
- At least 3 fun facts about the planet
- An image of the planet

