



Aspire Achieve Thrive

**Spring Term**  
**(Half Term 3 and 4)**  
**Science**  
**Year 10**

**Name:** \_\_\_\_\_

**Tutor:** \_\_\_\_\_

**Tassomai - 2 Daily Goals per week - Deadline is Friday**

### Year 10 Homework Timetable

<b>Monday</b>	English Task 1	Ebacc Option A Task 1	Option C Task 1	
<b>Tuesday</b>	Tassomai	Option B Task 1	Modern Britain Task 1	
<b>Wednesday</b>	Sparx	Science Task 1	Option C Task 2	
<b>Thursday</b>	Ebacc Option A Task 2	Tassomai	Option B Task 2	Modern Britain Task 2
<b>Friday</b>	Sparx	Science Task 2	English Task 2	



**Tassomai - 2 Daily Goals per week**  
**Sparx - 4 tasks of Sparx per week**

Option A (EBACC)
French
Geography
History

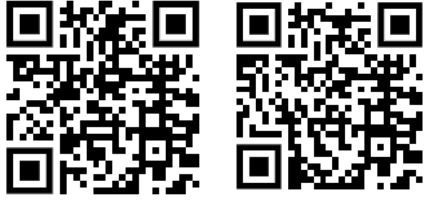


Open B
Art
Business Studies
Catering
Computer Science
History
Health & Social Care
Music
Sport
IT

Open C
Business Studies
Childcare
Catering
Drama
Geography
Health & Social Care
Triple Science
Sport

## Year 10 - Homework Plan Science Half Term 3

Week/Date	Homework Task	Examination Question
Week 1 2nd Jan	<b>Cornell Notes on diffusion, osmosis and active transport.</b>  	Exam question on diffusion
Week 2 9th January	<b>Revision Cards</b>	Exam question on Osmosis
Week 3 16th January	<b>Revision for assessments</b>	Exam question on Osmosis investigation
Week 4 23rd January	<b>Revision for assessments</b>	Exam question on digestive system
Week 5 30th January	<b>Cornell Notes on the group 1 and 7</b>  	Exam question on food tests
Week 6 6th February	<b>Revision Cards</b>	Exam question on Group 0, 1 and 7

**Year 10 - Homework Plan Science Half Term 4**

<b>Week/Date</b>	<b>Homework Task</b>	<b>Examination Question</b>
Week 1 DATE 2/01/2023	<b>Cornell Notes</b> on Electrolysis. 	Answer exam question on extraction of metals.
Week 2 DATE 9/01/2023	<b>Revision Cards</b> on Gravitational Potential Energy and Kinetic energy.	Answer exam question on gravitational potential energy and kinetic energy.
Week 3 DATE 16/1/2023	<b>Cornell Notes</b> on Elastic potential energy. 	Answer exam question on Hooke's law.
Week 4 DATE 23/01/2023	<b>Revision Cards</b> on Hooke's law.	Answer on elasticity.
Week 5 DATE 30/1/2023	<b>Cornell Notes</b> on aerobic and anaerobic respirations. 	Answer the exam question on the heart.
Week 6 DATE 6/2/2023	<b>Revision Cards</b> on coronary heart disease.	Answer the exam question on the nervous system.

### Combined Science Knowledge Organiser Year 10 Half Term 3

Biology		Chemistry		Working Scientifically	
Keyword	Definition	Keyword	Definition	Keyword	Definition
Diffusion	When particles in fluids move from an area of high concentration to one of low concentration.	Inert	Extremely unreactive.	Anomaly	A result that is very different from the rest of the results.
Osmosis	The diffusion of water from a dilute solution to a concentrated solution through a partially permeable membrane.	Stable	An atom with a full outer shell of electrons, either as the element (noble gases) or through forming a chemical bond.	Accuracy	A measurement result is considered accurate if it is judged to be close to the true value
Active Transport	Moving substances from a more dilute solution to a more concentrated solution. This requires energy from respiration.	Outer Shell	The shell of electrons on the outside of the atom. Not to be confused with all of the other electron shells.	Independent variable	The variable which is changed by the investigator.
Pancreas	An organ which produces digestive enzymes and hormones that help to regulate blood glucose concentration.	Shielding	Where the electrons on the inner shells shield the outer electrons from being attracted by the positive nuclear charge.	Suggest	Apply knowledge and understanding to a new situation.
Bile	An alkaline substance made by the liver to neutralise hydrochloric acid from the stomach. It also emulsifies fat to form small droplets which increases the surface area.	Reactivity	How easily an element or compound reacts. Metals are placed in an order of reactivity called the reactivity series.	Mean	When the values, excluding any anomalies, are added up and divided by the number of values.
Villi	Tiny, finger-shaped structures that increase the surface area for absorption of digested food.	Alkali Metals	Elements in Group 1. They form alkaline solutions when they react with water.	Explain	Make something clear, or state the reasons for something happening.
Enzyme	Biological catalysts that increase the speed of a chemical reaction	Halogens	Elements in Group 7.	Control variable	The variable that is to be kept constant or at least monitored.
Active Site	The place where the substrate molecule fits into the enzyme. They have a specific shape that matches the substrate.	Displacement	A more reactive element can displace a less reactive element out of its compound during a chemical reaction.	Dependent variable	The variable which the value is measured for each and every change in the independent variable.
Denature	When enzymes are exposed to extremes of pH or high temperatures the shape of their active site may change, preventing the substrate from fitting.	Oxidation	Adding oxygen (foundation tier) or losing electrons (higher tier)	Repeat	When multiple readings are taken to improve the reliability and validity of the data.
Substrate	The molecule that fits into the active site of an enzyme.	Reduction	Removing oxygen (foundation tier) or gaining electrons (higher tier)	Validity	Suitability of the investigative procedure to answer the question being asked.
Most Important Fact					
Digestion is the process of breaking down large insoluble molecules into small soluble ones that can be absorbed into our bloodstream. This happens through both mechanical (chewing) and chemical (enzymes) digestion.		The atomic structure of an element determines its reactivity. Metals are more reactive when they have more shells because it is easier to lose electrons and become ions. Non-metals are more reactive when they have fewer shells as it is easier to attract electrons to become ions.		When asked to suggest how a method could be improved, you should always look for any additional variables that could have been controlled, but were not. Temperature for example. You can also suggest that more data is collected to improve the validity of the conclusions.	

## Combined Science Knowledge Organiser Year 10 Half Term 4

Biology		Chemistry		Physics	
Keyword	Definition	Keyword	Definition	Keyword	Definition
Vena cavae	One of the two veins that carries deoxygenated blood to the heart from the body systems.	Reactivity	A measure of how vigorously a substance will react.	Force	A push or a pull. The unit of force is the newton (N)
Pulmonary Veins	One of the four veins that carries oxygenated blood to the heart from the lungs.	Oxidation	The gain of oxygen, or loss of electrons, by a substance during a chemical reaction.	Deformation	Changing shape and/ or size as a result of forces being applied.
Ventricles	The lower chamber of the heart that receives blood from the atrium and pumps it into arteries.	Reduction	The loss of oxygen, gain of electrons, or gain of hydrogen by a substance during a chemical reaction.	Elastic	Materials that return to their original shape and size after being stretched or squashed.
Aorta	Main artery which carries oxygenated blood from the heart in mammals.	Molten	A term used to describe a liquid substance ( e.g. rock, glass or metal) formed by heating a solid.	Inelastic	Materials that do not return to their original shape and size after being stretched or squashed.
Pulmonary Artery	The artery which carries deoxygenated blood from the heart to the lungs.	Ore	A rock containing enough quantities of a mineral for extraction to be possible.	Extension	Increase in length, for example, as a result of being pulled.
Systemic Circulation	The part of the circulatory system that includes the left side of the heart, the rest of the body apart from the lungs, and the blood vessels that connect them together.	Electrolysis	The decomposition ( breakdown) of a compound using an electric current.	Compression	A shortening in length, for example as a result of being squeezed.
Heart Failure	A condition where the heart is failing to pump sufficient blood around the body at the appropriate pressures.	Ions	Electrically charged particles, formed when an atom or molecule gains or loses electrons.	Limit of Proportionality	The point beyond which Hooke's law is no longer true when stretching a material.
Atrium	In the heart, this is the upper chamber which collect blood returning from the body or from the lungs.	Cathode	The negative electrode during electrolysis.	Proportional	When two quantities have the same ratio or relative size.
Plasma	The liquid part of the blood containing useful substances like glucose, amino acids, minerals, vitamins (nutrients) and hormones, as well as waste materials such as urea.	Anode	The positive electrode during electrolysis.	Gravitational potential energy	The energy stored by an object lifted up against the force of gravity. Also known as GPE.
Vena cavae	One of the two veins that carries deoxygenated blood to the heart from the body systems.	Half equation	An equation, involving ions and electrons, that describes the process happening at an electrode.	Kinetic energy	Energy which an object possesses by being in motion.
<b>Most Important Fact</b>					
Multicellular organisms require transport systems to supply their cells and remove waste products. In humans, one of the functions of the circulatory systems is to transport substances.		Electrolysis involves using electricity to break down electrolytes to form elements. The products of electrolysis can be predicted for a given electrolyte.		Forces are responsible for changing the motion of objects. If more than one force is present, the shape of an object can also be changed.	

## STEP 2: CREATE CUES

**What:** Reduce your notes to just the essentials.

**What:** Immediately after class, discussion, or reading session.

**How:**

- Jot down key ideas, important words and phrases
- Create questions that might appear on an exam
- Reducing your notes to the most important ideas and concepts improves recall. Creating questions that may appear on an exam gets you thinking about how the information might be applied and improves your performance on the exam.

**Why:** Spend at least ten minutes every week reviewing all of your previous notes. Reflect on the material and ask yourself questions based on what you've recorded in the Cue area. Cover the note-taking area with a piece of paper. Can you answer them?

## STEP 1: RECORD YOUR NOTES

**What:** Record all keywords, ideas, important dates, people, places, diagrams and formulas from the lesson. Create a new page for each topic discussed.

**When:** During class lecture, discussion, or reading session.

**How:**

- Use bullet points, abbreviated phrases, and pictures
- Avoid full sentences and paragraphs
- Leave space between points to add more information later

**Why:** Important ideas must be recorded in a way that is meaningful to you.

## STEP 3: SUMMARISE & REVIEW

**What:** Summarise the main ideas from the lesson.

**What:** At the end of the class lecture, discussion, or reading session.

**How:** In complete sentences, write down the conclusions that can be made from the information in your notes.

**Why:** Summarising the information after it's learned improves long-term retention.

Date.....

Q1.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Diffusion is an important process in animals and plants.

The movement of many substances into and out of cells occurs by diffusion.

Describe why diffusion is important to animals and plants.

In your answer you should refer to:

- animals
- plants
- examples of the diffusion of named substances.

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(Total 6 marks)



Date     /     /

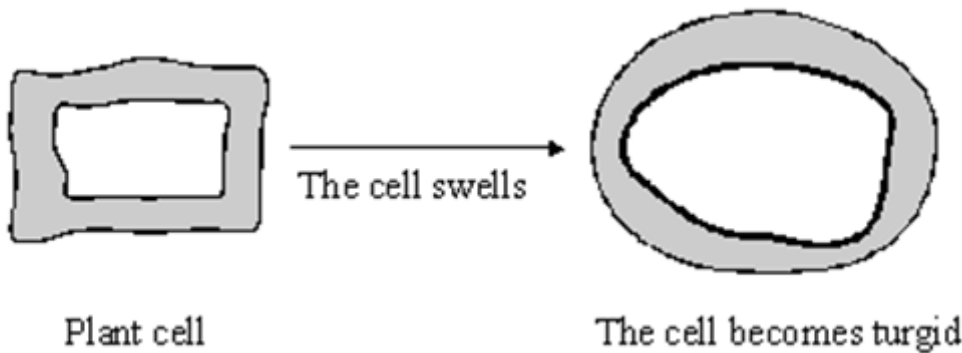
Topic

Questions	Notes

Summary

Date.....

- Q2.  
(a) The diagrams show what happens to the shape of a plant cell placed in distilled water.



- (i) Explain why the cell swells and becomes turgid. Name the process involved.

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- (2)  
(ii) Give one feature of the cell wall which allows the cell to become turgid.

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- (1)  
(b) Describe the change which will occur if a piece of peeled potato is placed in a concentrated sugar solution and explain why this change occurs.

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- (3)  
(Total 6 marks)

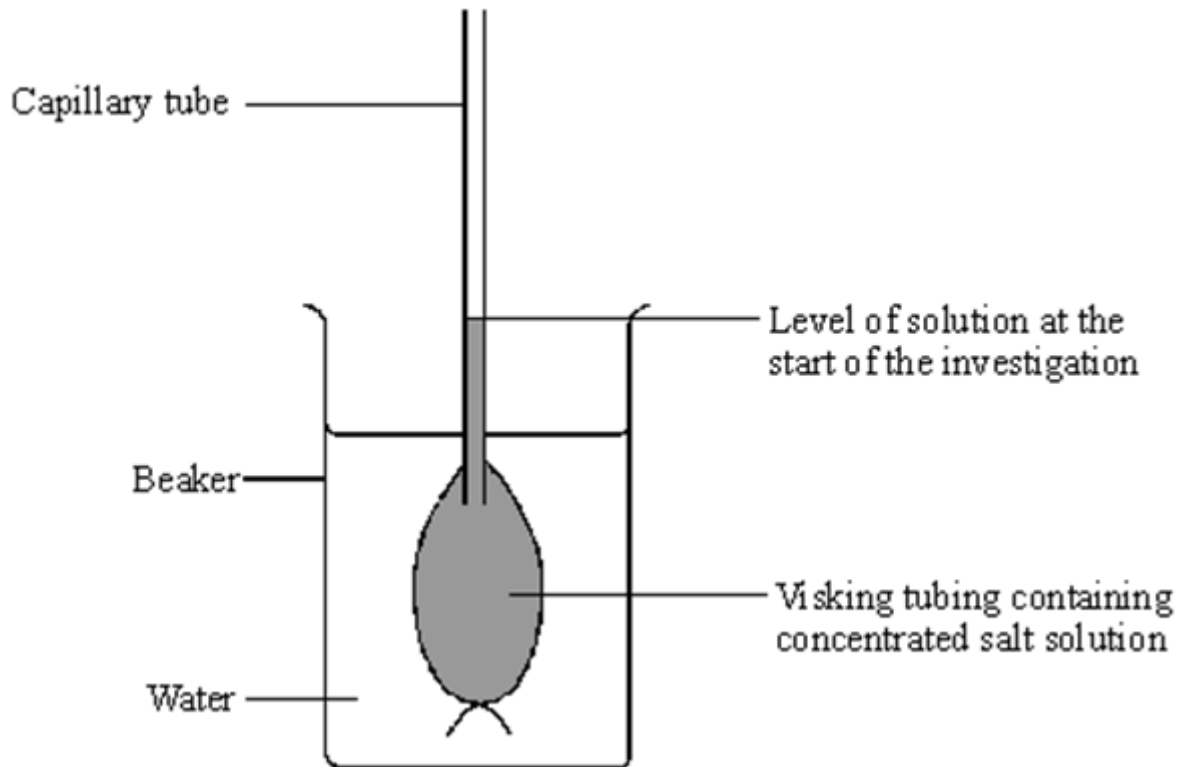
**Now complete your revision cards**

# WEEK 3 Half Term 3

Date.....

Q3.

Some students set up the equipment below to investigate osmosis.



(a) What is osmosis?

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(3)

(b) (i) What will happen to the water level in the capillary tube during the investigation because of osmosis?

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(1)

(ii) Use your knowledge of osmosis to explain why this happens.

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(2)

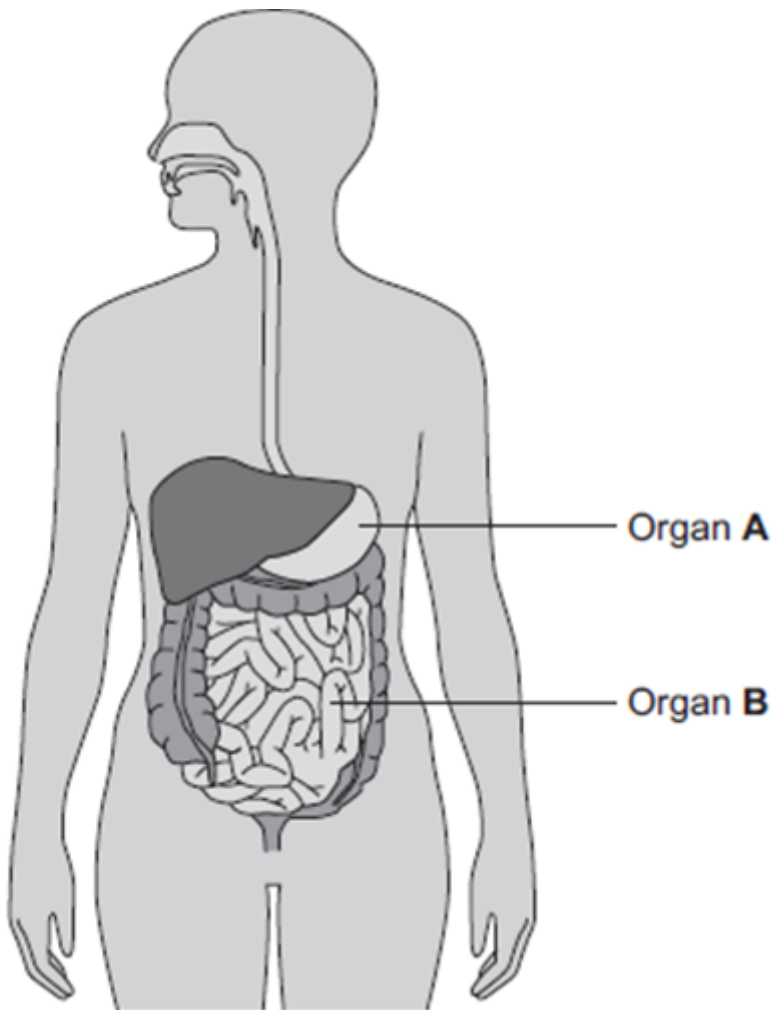
(Total 6 marks)



Date.....

Q4.

The diagram below shows the human digestive system.



(a) (i) What is Organ A?

Draw a ring around the correct answer.

- gall bladder**                      **liver**                      **stomach**

(1)

(ii) What is Organ B?

Draw a ring around the correct answer.

- large intestine**                      **pancreas**                      **small intestine**

(1)

(b) Digestive enzymes are made by different organs in the digestive system.

Complete the table below putting a tick (✓) or cross (×) in the boxes.

The first row has been done for you.

		Organ producing enzyme			
		salivary glands	stomach	pancreas	small intestine
Enzyme	amylase	✓	×	✓	✓
	lipase				
	protease				

(2)

(c) The stomach also makes hydrochloric acid.

How does the acid help digestion?

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(1)

(d) Draw one line from each digestive enzyme to the correct breakdown product.

**Digestive enzyme**

**Breakdown products**

**Amylase breaks  
down starch into.....**

**amino acids.**

**Lipase breaks down  
fats into...**

**bases.**

**Protease breaks  
down proteins into...**

**fatty acids and  
glycerol.**

**sugars.**

(3)

(Total 8 marks)

Date      /      /

Topic

Questions	Notes

**Summary**



# WEEK 5 Half Term 3

Date.....

**Q5.**

Describe how to test a sample of food for protein, starch and sugar.

Give the colours that would be seen if the food sample contained protein, starch and sugar.

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**(Total 6 marks)**

**Date      /      /**

**Topic**

<b>Questions</b>	<b>Notes</b>

**Summary**

## WEEK 6 Half Term 3

Date.....

### Q6.

This question is about groups in the periodic table.

Neon and argon are Group 0 elements.

(a) What name is given to Group 0?

\_\_\_\_\_ (1)

(b) Give **one** similarity of the electronic structure of neon and the electronic structure of argon.

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

(1)

(c) Give **one** difference between the electronic structure of neon and the electronic structure of argon.

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

(1)

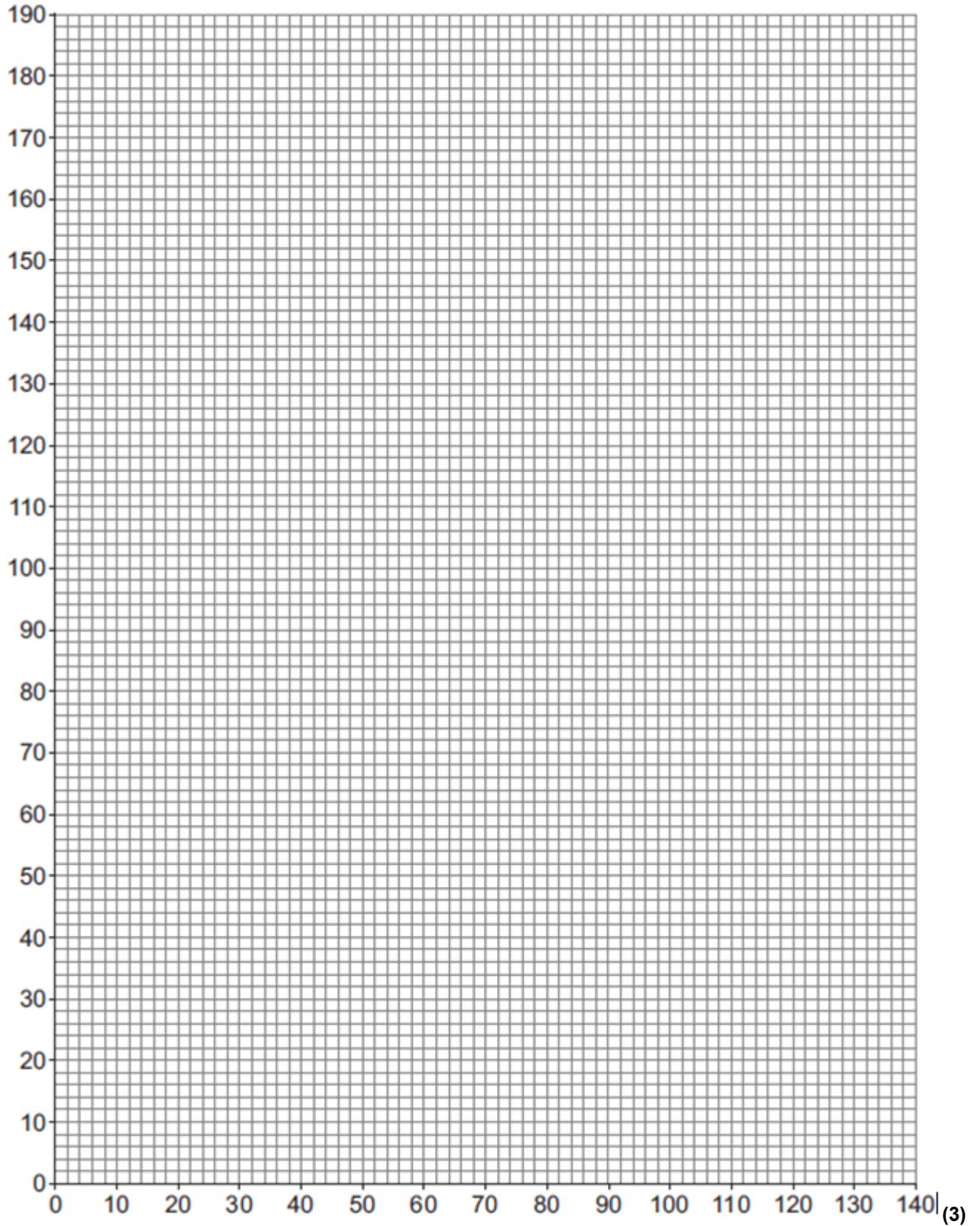
(d) The table below shows information about elements in Group 1.

Element	Relative atomic mass	Melting point in °C
Lithium	7	181
Sodium	23	98
Potassium	39	64
Rubidium	85	39
Caesium	133	29

Complete the graph below.

You should:

- label both axes
- plot the data from the table above.



(e) Give **one** conclusion from the data in the graph above.

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(1)

(Total 7 marks)

**Now complete your revision cards**

**HALF**

**TERM**

**4**

Date.....

**Q1.** Cassiterite is an ore of the metal tin.

(a) What is an ore?

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(2)

(b) Some metals are obtained by removing oxygen from the metal oxide.

What name do we give to this chemical reaction?

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(1)

(c) Name **one** metal which must be extracted from its melted ore by electrolysis rather than by using carbon.

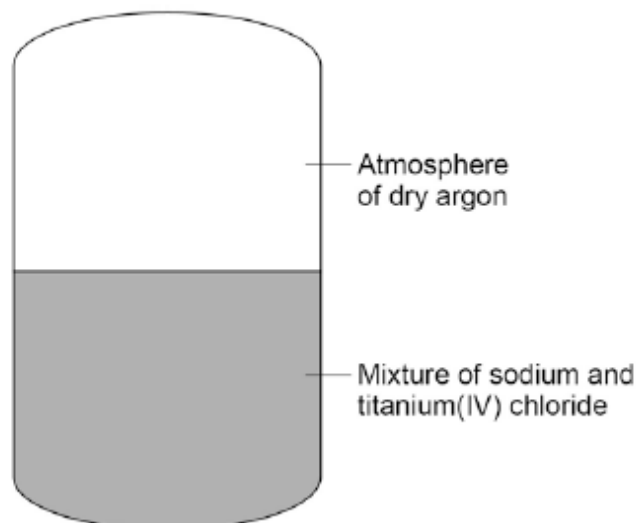
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(1)

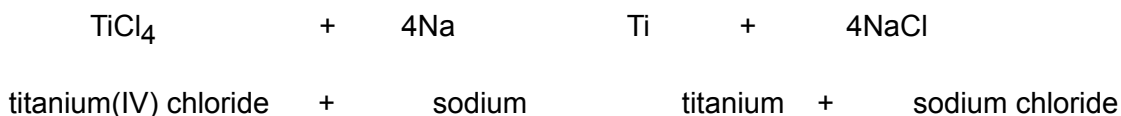
(Total 4 marks)

**Q2.** Figure 1 shows a reactor used to produce titanium from titanium(IV) chloride.

**Figure 1**



The chemical equation for the reaction of titanium(IV) chloride with sodium is:



(a) For one reaction:

- 1615 kg titanium(IV) chloride reacted completely with 782 kg sodium
- 1989 kg sodium chloride was produced.

Calculate the mass of titanium produced from this reaction.

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Mass of titanium = \_\_\_\_\_ kg

(1)

(b) The table below shows the solubility of sodium chloride in 100 cm<sup>3</sup> of aqueous solution at different temperatures.

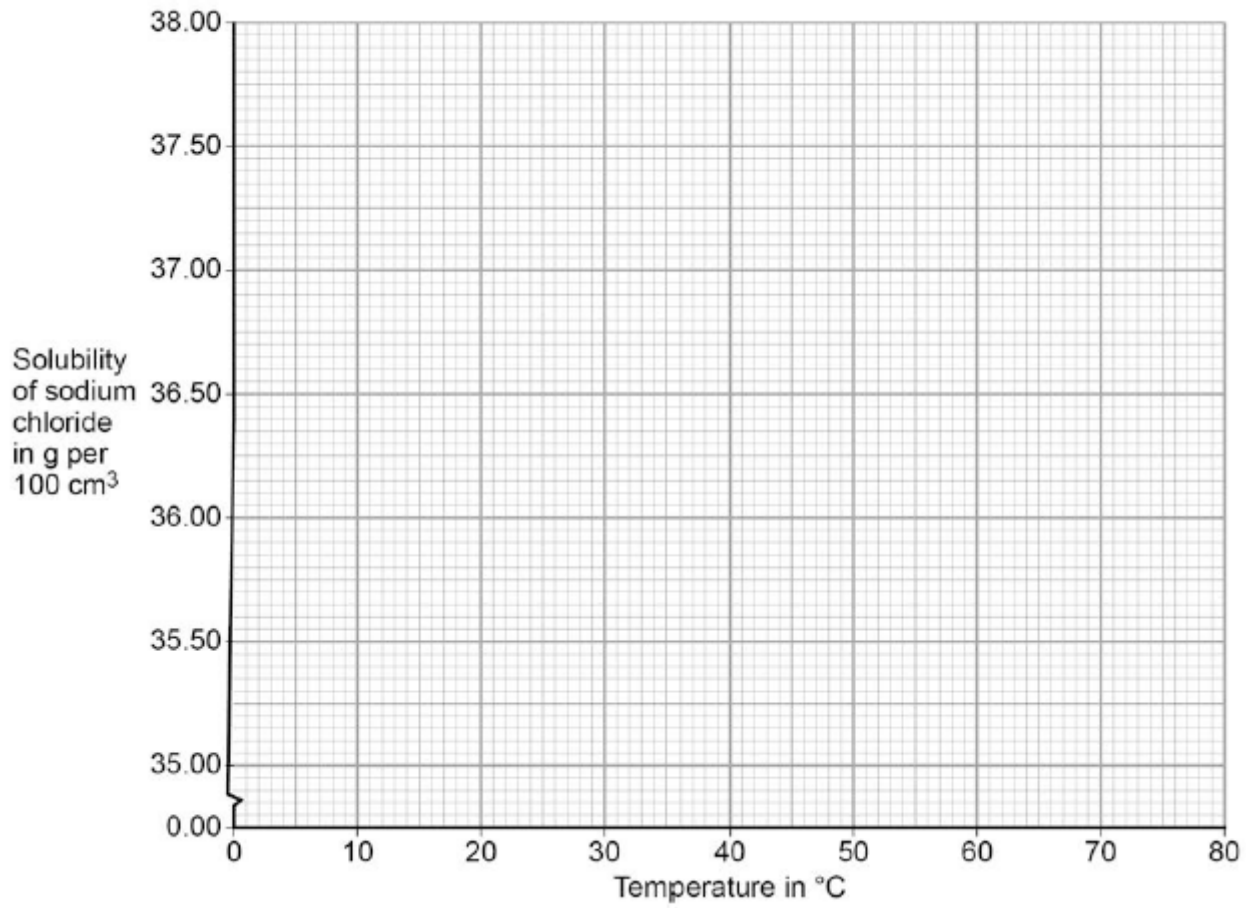
Solubility of sodium chloride in g per 100cm <sup>3</sup>	Temperature in °C
35.72	10
35.89	20
36.09	30
37.37	40
36.69	50
37.04	60

On **Figure 2**:

- plot this data on the grid
- draw a line of best fit.



**Figure 2**



(3)

Date     /     /

Topic

<b>Questions</b>	<b>Notes</b>

Summary

Date.....

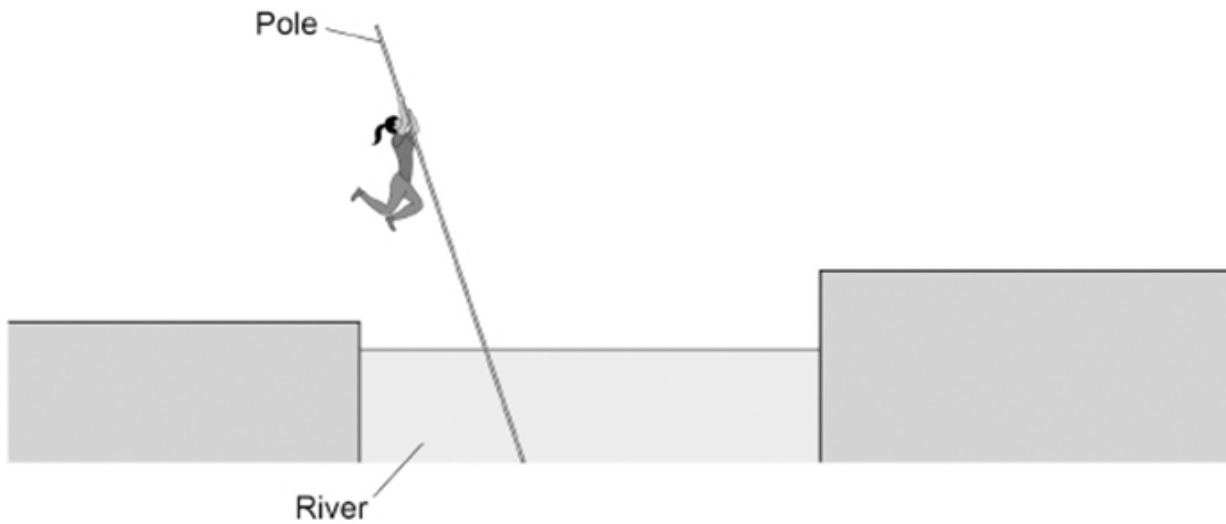
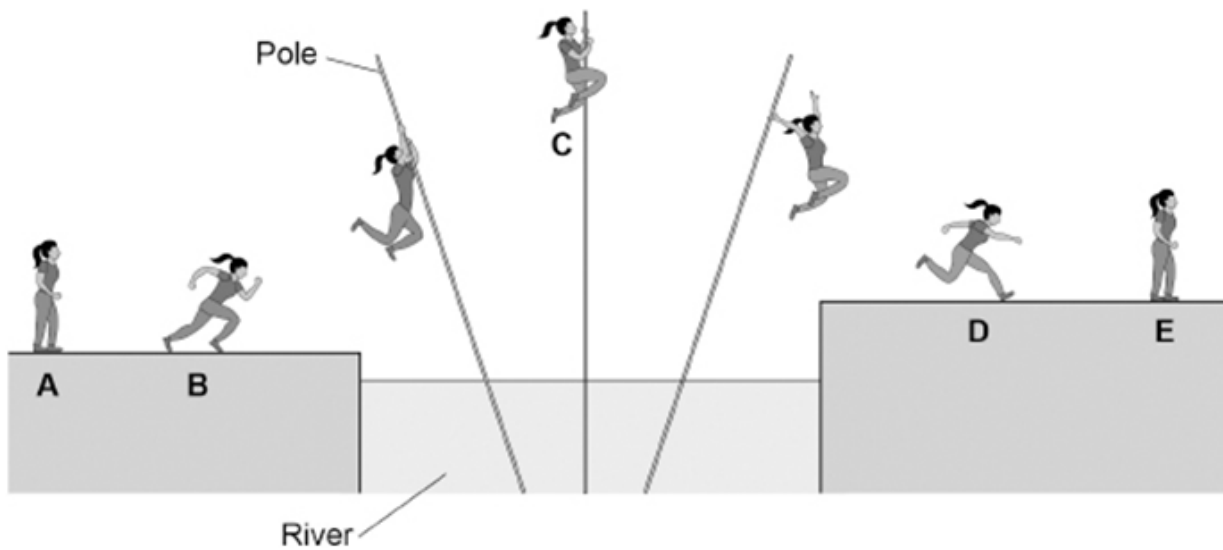


Figure 2 shows the athlete in different stages of far-leaping.

Figure 2



(a) Complete the sentence.

Choose answers from the box.

chemical	nuclear	kinetic
	elastic potential	gravitational potential

Between positions **A** and **B** the athlete speeds up. There is an increase in the athlete's \_\_\_\_\_ energy and a decrease in the athlete's \_\_\_\_\_ store of energy.

(b) Between positions **B** and **C** the athlete jumps to the pole and climbs up it.

Which statement describes a change in the athlete's energy between positions **B** and **C**?

Tick (✓) **one** box.

Elastic potential energy decreases.

Elastic potential energy increases.

Gravitational potential energy decreases.

Gravitational potential energy increases.

(1)

(c) The pole falls over from position **C**. The athlete lets go of the pole and lands at position **D**.

The change in height of the athlete between positions **C** and **D** is 3.0 m.

mass of athlete = 50 kg

gravitational field strength = 9.8 N/kg

Calculate the change in gravitational potential energy of the athlete between positions **C** and **D**.

Use the equation:

change in gravitational potential energy = mass × gravitational field strength × change in height

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Change in gravitational potential energy = \_\_\_\_\_ J

(2)

(d) The kinetic energy of the athlete at position **D** is 1600 J.

mass of athlete = 50 kg

Calculate the speed of the athlete at position **D**.

Use the equation:

$$\text{speed} = \sqrt{\frac{2 \times \text{kinetic energy}}{\text{mass}}}$$

Choose the unit from the box.

<b>m/s</b>	<b>J/kg</b>	<b>J/s</b>
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Speed = \_\_\_\_\_ Unit \_\_\_\_\_

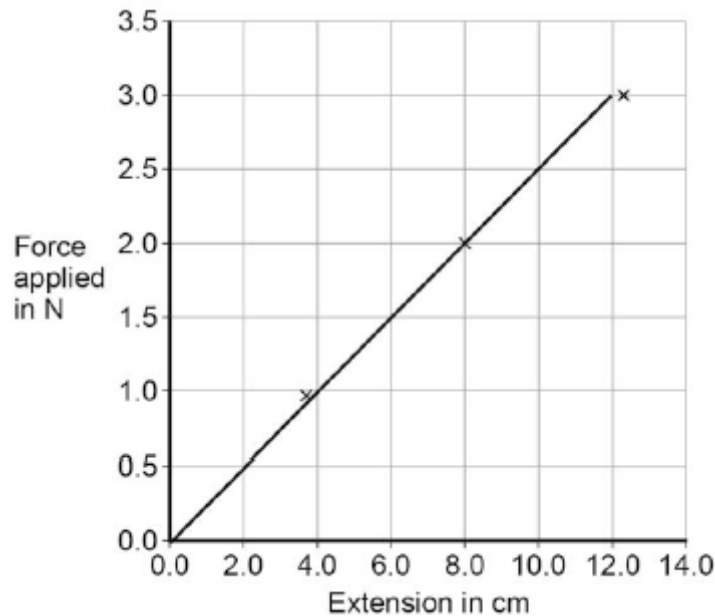
(3)

**Now complete your revision cards**

Date.....

**Q1.** A student changed the force applied to a spring by adding weights.

The figure below shows a graph of her results.



(a) Write down the equation that links the force applied and extension for a spring.

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(1)

(b) Identify the pattern shown in the figure above.

Explain your answer.

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(2)

(c) Give **one** way the student could improve her investigation.

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(1)

(d) Describe the relationship between work done and elastic potential energy in stretching a spring.

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(2)

(e) Draw a line on the figure above to show the results for a stiffer spring.

Explain the reason for the line you have drawn.

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(3)

(f) Explain what would happen to the spring if the student kept adding weights?

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(2)

**(Total 11 marks)**

Date      /      /

Topic

<b>Questions</b>	<b>Notes</b>

**Summary**

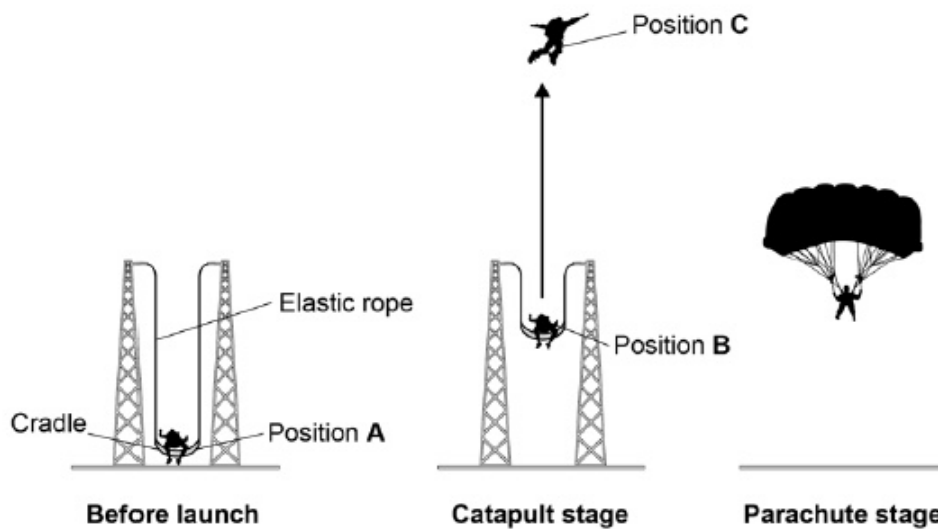


Date.....

## Week 4

The diagram shows the stages of an extreme sport called 'human catapult'.

- A person lies in a cradle which is held to the ground.
- The cradle is released.
- The person is launched vertically into the air by an elastic rope.
- The person then parachutes back to the ground.



(a) In position **A** there is a store of elastic energy.

Position **C** is the person's maximum height.

Describe the energy transfers from position **A**, through position **B**, to position **C**.

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(3)

(b) In the last few metres of his descent during the parachute stage, the person travels at a terminal velocity.

Explain why.

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(2)

(c) When stretched in position **A**, the elastic rope stores 25 000 joules.

The elastic rope behaves like a spring, with a spring constant of 125 N/m

Calculate the extension of the elastic rope.

Use the Physics Equations Sheet.

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Extension of elastic rope = \_\_\_\_\_ m

(4)

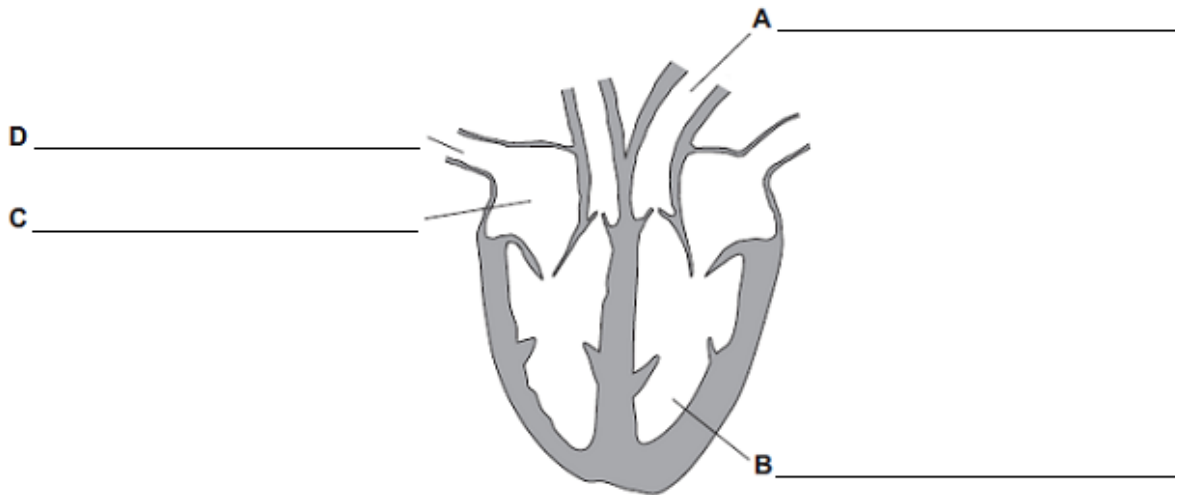
**Now complete your revision cards**

Date.....

**Q1.**

**Diagram 1** shows a section through the heart.

**Diagram 1**



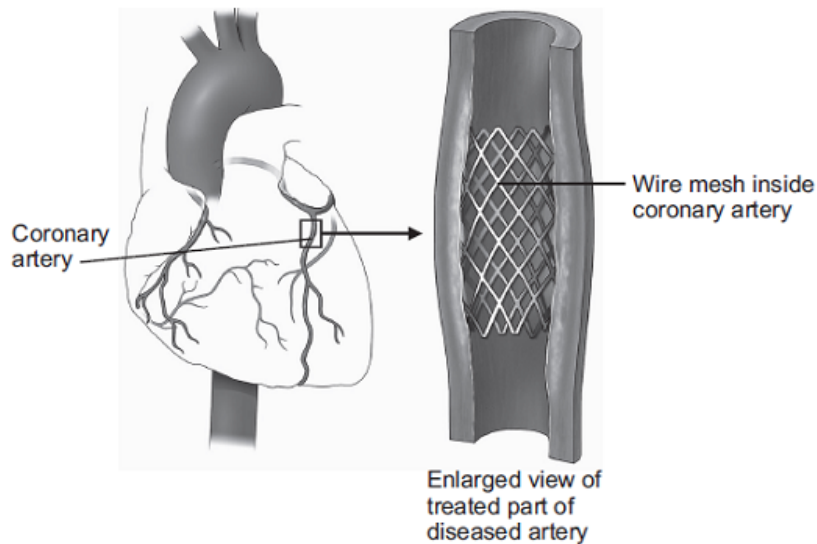
(a) Use words from the box to label parts A, B, C and D.

artery	atrium	capillary	platelet	vein	ventricle
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(4)

(b) **Diagram 2** shows one treatment for a diseased coronary artery.

**Diagram 2**



(i) Name the treatment shown in **Diagram 2**.

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(1)

(ii) Explain how the treatment works.

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(2)

**(Total 7 marks)**

Date     /     /

Topic

<b>Questions</b>	<b>Notes</b>

**Summary**

Date.....

**Q1.**

Reflex actions are rapid and automatic.

(a) Name the following structures in a reflex action.

(i) The structure that detects the stimulus.

\_\_\_\_\_

(1)

(ii) The neurone that carries impulses to the central nervous system.

\_\_\_\_\_

(1)

(iii) The neurone that carries impulses away from the central nervous system.

\_\_\_\_\_

(1)

(iv) The structure that brings about the response.

\_\_\_\_\_

(1)

(b) Describe what happens at a synapse when an impulse arrives.

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

(2)

(c) Some people have a condition in which information from the skin does not reach the brain.

Explain why this is dangerous for the person.

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

(2)

**Now complete your revision cards**







# Half Term 3 Revision Cards



Revision Card	Answers
<ol style="list-style-type: none"><li>1. What are the tests for sugar, starch and lipids?</li><li>2. What molecules are broken down by carbohydrases?</li><li>3. State the factors that affect the rate of reaction in enzymes.</li><li>4. Which reagent is used to test for starch?</li><li>5. State the name of the simplified model to explain enzyme action.</li></ol>	

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Revision Card	Answers
<ol style="list-style-type: none"><li>1. State the two classification systems.</li><li>2. Describe the process of selective breeding for a cow that produces a lot of milk.</li><li>3. State a disadvantage of selective breeding.</li><li>4. Describe the process of genetic engineering.</li><li>5. State a disadvantage of genetic engineering.</li></ol>	

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Revision Card	Answers
<ol style="list-style-type: none"><li>1. What are the names given to group 0, 1 and 7 respectively?</li><li>2. Describe how the reactivity of group 1 changes as you go down the group.</li><li>3. Describe how the reactivity of group 7 changes as you go down the group.</li><li>4. State what happens in an oxidation reaction.</li><li>5. Define displacement reactions.</li></ol>	



# Half Term 4 Revision Cards



Revision Card	Answers
<ol style="list-style-type: none"><li>1. What is the unit of energy?</li><li>2. What equation is used to calculate gravitational potential energy?</li><li>3. What equation is used to calculate kinetic energy?</li><li>4. What is the law of conservation of energy?</li><li>5. Describe the energy changes happening when a ball bounces back up from the floor.</li></ol>	

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Revision Card	Answers
<ol style="list-style-type: none"><li>1. Describe a graph for a directly proportional relationship.</li><li>2. A stiffer spring will have a spring constant that is bigger OR smaller than a less stiff spring?</li><li>3. What equation describes Hooke's law?</li><li>4. What is the unit of spring constant?</li><li>5. Describe how the extension of a spring would change if we doubled the force acting on it.</li></ol>	

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Revision Card	Answers
<ol style="list-style-type: none"><li>1. What is coronary heart disease?</li><li>2. What medicine is used to reduce blood cholesterol levels and slow down the rate of fatty material deposit?</li><li>3. What are the risk factors for coronary heart diseases?</li><li>4. What are the advantages of treating cardiovascular diseases by implant?</li><li>5. What are the disadvantages of treating cardiovascular diseases by implant/</li></ol>	

Aspire  
ACHIEVE  
Thrive

Develop your character

