



Aspire Achieve Thrive

**Spring Term**  
**(Half Term 3 and 4)**  
**Science**  
**Year 11**

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

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

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

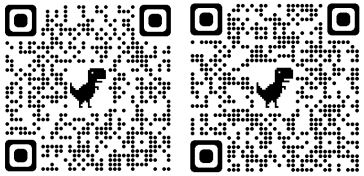
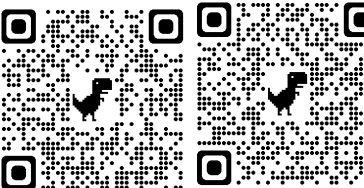
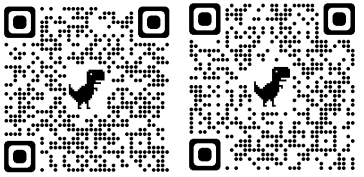
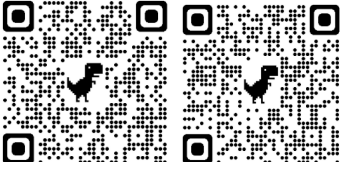
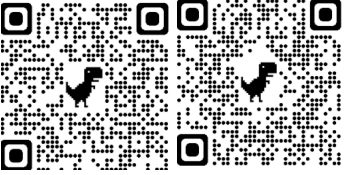
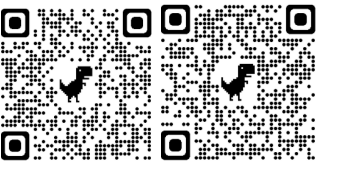
### Year 11 Homework Timetable

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

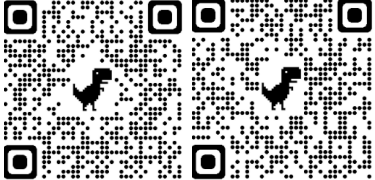
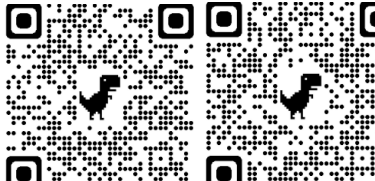
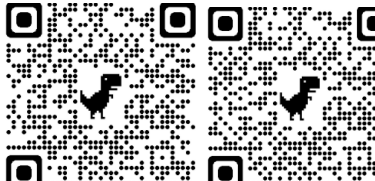
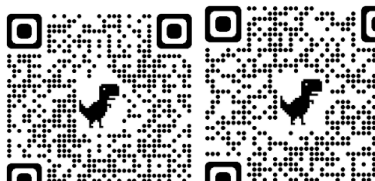

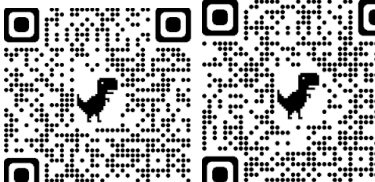
Block A	Block B	Block C	Block D
Art	Business Studies	Art	French
Dance	Child Development	Business Studies	Geography
Drama	Catering	Geography	History
Media Studies	Computer Science	Health & Social Care	
Music	Drama	History	
Photography	Health & Social Care	Catering	
	IT	Photography	
	Media Studies	Sport	
	Sociology	Travel & Tourism	
	Sport		

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

**Year 11 - Homework Plan Science - Half Term 3**

Week/Date	Homework Task	Examination Question
Week 1 2/01/23	<b>Cornell Notes - The Carbon Cycle</b> 	Answer the questions on the carbon cycle
Week 2 9/1/23	<b>Revision Cards - contraceptive methods</b> 	Answer the question on contraception
Week 3 16/1/23	<b>Cornell Notes - fractional distillation</b> 	Answer the question on fractional distillation
Week 4 23/1/23	<b>Revision Cards - life cycle assessments</b> 	Answer questions on life cycle assessments
Week 5 30/1/23	<b>Cornell Notes - stopping distances</b> 	Answer questions on stopping distances
Week 6 6/1/23	<b>Revision Cards - Electromagnets</b> 	Answer the question on electromagnets

**Year 11 - Homework Plan Science - Half Term 4**

Week/Date	Homework Task	Examination Question
Week 1 20/2/23	<b>Cornell Notes</b> - Acceleration required practical 	Answer question on acceleration
Week 2 27/2/23	<b>Revision Cards</b> - Chromatography 	Answer the question on chromatography
Week 3 6/2/23	<b>Cornell Notes</b> - Biotic and abiotic 	Answer questions on biotic and abiotic factors
Week 4 12/2/23	<b>Cornell Notes</b> - IR investigation 	Answer questions on IR investigation
Week 5 20/2/23	<b>Cornell Notes</b> - Rates of reaction - collecting gas 	Answer questions on rates - collecting gas
Week 6 27/2/23	<b>Revision Cards</b> - adaptations 	Answer the question on how animals are adapted to the polar environment

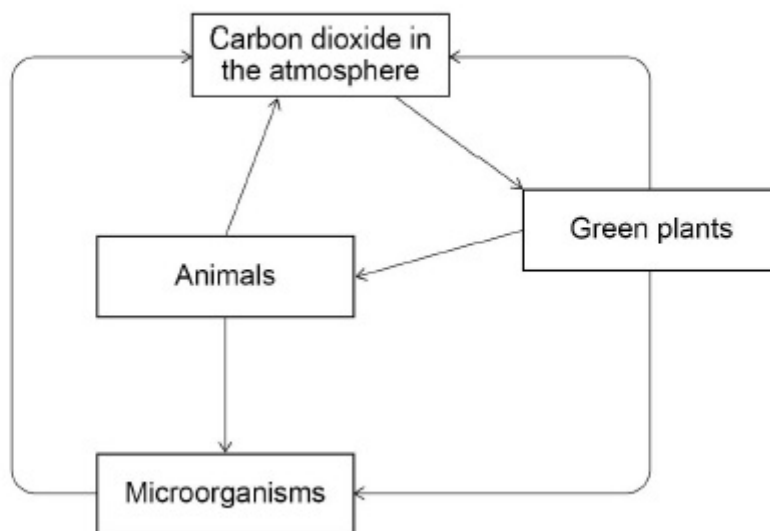
Biology		Chemistry		Physics	
Keyword	Definition	Keyword	Definition	Keyword	Definition
Chromosome	A section of the DNA molecules containing a number of genes.	Finite	A resource that has a limited supply.	Velocity	A vector quantity giving speed and direction.
Genome	The entire sequence of genes in a given organism.	Viscosity	The thickness or runniness of a liquid. A viscous liquid flows slowly.	Acceleration	The rate of change of the velocity of an object.
Allele	A version of a given gene.	Hydrocarbon	A molecule containing only hydrogen and carbon atoms.	Deceleration	Negative acceleration; the object's speed is decreasing.
Dominant	An allele which is always expressed in the phenotype even if only one copy is present.	Alkane	A saturated hydrocarbon with the general formula $C_nH_{2n+2}$	Displacement	Distance moved in a straight line from the starting point.
Recessive	An allele only expressed in the phenotype if both copies are present	Alkene	Hydrocarbon with at least one double bond; general formula $C_nH_{2n}$	Uniform motion	Moving in a straight line at a constant speed.
Phenotype	The expression of the genotype.	Fractionating	To divide into fractions or components.	Inertia	The tendency of an object to continue in its current state (at rest or in uniform velocity).
Genotype	The alleles an organism has for a given gene.	Polymer	A large molecule made up of repeating monomers.	Momentum	This is the tendency of the object to keep moving in the same direction.
Homozygous	Having two identical alleles for a given gene.	Cracking	Larger hydrocarbon molecules are broken down into smaller, more useful hydrocarbons.	Equilibrium	When the size and direction of forces acting in opposite directions are exactly balanced.
Heterozygous	Having two different alleles for a given gene.	Exothermic	A reaction which gives out thermal energy to the surrounding environment.	Conservation	Energy can be transferred from one store to another but all must be accounted for.
Mutation	A random change in the DNA sequence.	Endothermic	A reaction which takes in thermal energy from the surrounding environment.	Adverse	Unfavourable conditions which can prevent success.
Most Important Fact					
Variation in species can be generated by genetics. Mutations arise spontaneously and can sometimes lead to genetic disorders or death		Many of the fractions which can be produced from crude oil undergo exothermic reactions and can be used as fuels. The shorter the chain, the more flammable and useful as a fuel the fraction is.		Any object will continue to do exactly as it is currently doing, in terms of motion, unless acted upon by a force. The energy put into an object to make it move or cause an action is equal to the energy released or used by the object.	

Biology		Chemistry		Physics	
Keyword	Definition	Keyword	Definition	Keyword	Definition
Homeostasis	The regulation of a constant internal environment.	Acid	A substance with a pH value below 7	Atom	The smallest part of an element that can exist
Endocrine system	Glands which secrete hormones directly into the bloodstream.	Alkali	A substance with a pH value above 7	Isotope	Atoms of the same element with different numbers of neutrons.
Glucose	A simple sugar that is made by plants during photosynthesis and used in respiration.	Base	A substance which dissolves to form an alkali solution	Alpha particle	An alpha particle is also a Helium-4 nucleus, so it is written as ${}^4_2\text{He}$
Diabetes	A condition where the body does not produce enough insulin	Neutralisation	A reaction in which an acid and an alkali are balanced to form a solution with pH 7.	Beta particle	An electron that has come from the nucleus
Hormones	A chemical substance produced by a gland and carried in the bloodstream which alters the activity of specific target organs.	Salt	A chemical formed when an acid neutralises a base.	Radiation	Energy transferred as a wave spreading out from a source - eg light, infrared, sound.
Menstrual cycle	A process which takes around 28 days. In which the lining of the uterus is prepared for pregnancy. If pregnancy does not happen, the lining is then shed.	Mass number	The total number of protons and neutrons	Radioactive decay	An unstable nucleus becoming more stable over time by randomly (spontaneously) emitting ionising radiation
Contraception	A group of methods used to prevent conception.	Concentration	A measure of how many particles there are dissolved in a given volume.	Irradiation	Exposing objects to beams of radiation
Glands	An organ or tissue that makes a substance for release. such as hormones.	Dilute	A solution with a low amount of solute per volume.	Contamination	When an object is exposed to a source of radiation outside the object.
Insulin	A hormone produced by the pancreas that regulates glucose concentrations in the blood.	Mole	The amount of substance that contains the same number of particles as there are atoms in 12 g of carbon-12 (contains the Avogadro's constant $6.0 \times 10^{23}$ number of particles)	Half Life	The time it takes for half of the unstable nuclei in a sample to decay or for the activity of the sample to halve or for the count rate to halve
Nervous System	The body system that includes the brain, spinal cord and nerves.	Crystallisation	As a solution cools, crystals form	Nucleus	The central part of an atom. It contains protons and neutrons, and has most of the mass of the atom.
Most Important Fact					
The body is controlled by the actions of the nervous and endocrine systems. The nervous system is a rapid system whereas the endocrine system acting via hormones acts over a longer period of time.		Acids have a pH below 7 whereas alkali have a pH above 7. When in solution acids and alkali can react to form a neutral solution containing a salt. The salt can be separated from the solution by crystallisation.		Unstable nuclei break down emitting radiation. The emission of radiation is random but the number of nuclei that undergo the process occurs at a steady rate.	

Date.....

(c) Plants take in carbon dioxide from the atmosphere.

The diagram shows part of the carbon cycle.



Describe how carbon from the atmosphere is cycled through living organisms.

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Date     /     /

Topic **The Carbon Cycle**

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

**Summary**



# WEEK 2 Half Term 3

Date.....

(c) The table below shows information about three methods of contraception.

	<b>Condom</b>	<b>Oral contraceptive</b>	<b>Hormone skin patch</b>
Percentage (%) effectiveness	98.0	99.7	99.8
How contraception is obtained	From shops or sexual health clinic	From doctor or sexual health clinic	
Possible side effects	No serious side effects	Headaches, nausea, high blood pressure	Headaches, nausea, blood clots

Evaluate the use of these contraceptive methods.

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(6)

**Now complete the revision cards on contraception.**

# WEEK 3 Half Term 3

Date.....

Alkanes are hydrocarbons found in crude oil.

(a) (i) Complete the sentence.

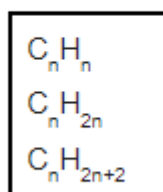
Hydrocarbons contain the elements \_\_\_\_\_ and \_\_\_\_\_ only.

(1)

(ii) Ethane is an alkane with the formula  $C_2H_6$

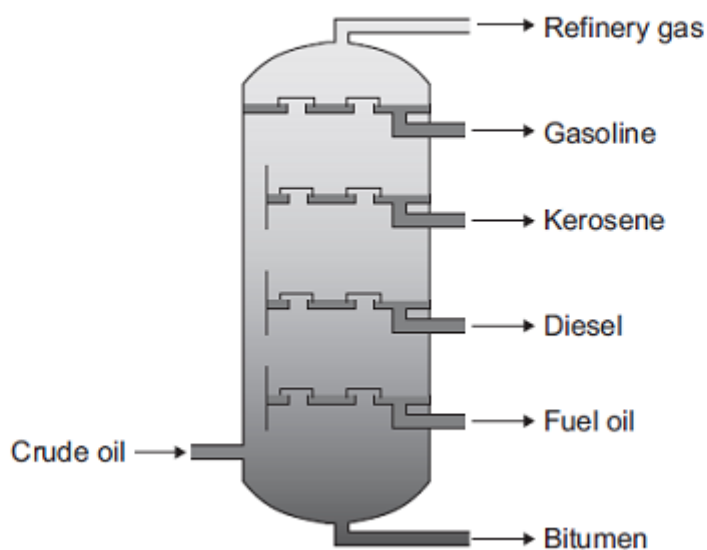
Draw a ring around the correct answer to complete the sentence.

Alkanes are hydrocarbons with the general formula



(1)

(b) Crude oil is separated into useful fractions by fractional distillation.



Describe and explain how crude oil is separated into fractions by fractional distillation. Use the diagram to help you answer the question. (4 marks)

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Date / /

Topic: Fractional Distillation

Questions	Notes

Summary

# WEEK 4 Half Term 3

Date.....

Hydrocarbons are used to make useful products.

(a) What are the elements in hydrocarbons?

Tick **one** box.

Carbon and hydrogen only

Carbon, hydrogen and oxygen

Carbon and nitrogen only

Carbon, nitrogen and oxygen

Poly(ethene) is a polymer made from ethene. Poly(ethene) is used to make plastic bags.

**Table 2** is from a life cycle assessment comparing paper bags and plastic bags.

**Table 2**

	Paper bag	Plastic bag
Raw material	Wood (renewable)	Oil or gas (non-renewable)
Energy used to make in MJ	1.7	1.5
Solid waste produced in g	50	14
Carbon dioxide produced in kg	0.23	0.53

Evaluate which type of bag is more environmentally friendly.

Use data from **Table 2** and your own knowledge to support your answer.

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(6 marks)

**Now complete the revision cards on life cycle assessments**

# WEEK 5 Half Term 3

Date.....

A man is driving his car at a constant speed on a wet road.

He sees a fallen tree on the wet road and tries to stop quickly to prevent an accident.



Explain why the man may not be able to stop in time.

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(6 marks)

Date       /       /

Topic: Stopping distances

Questions	Notes

Summary



**HALF**

**TERM**

**4**

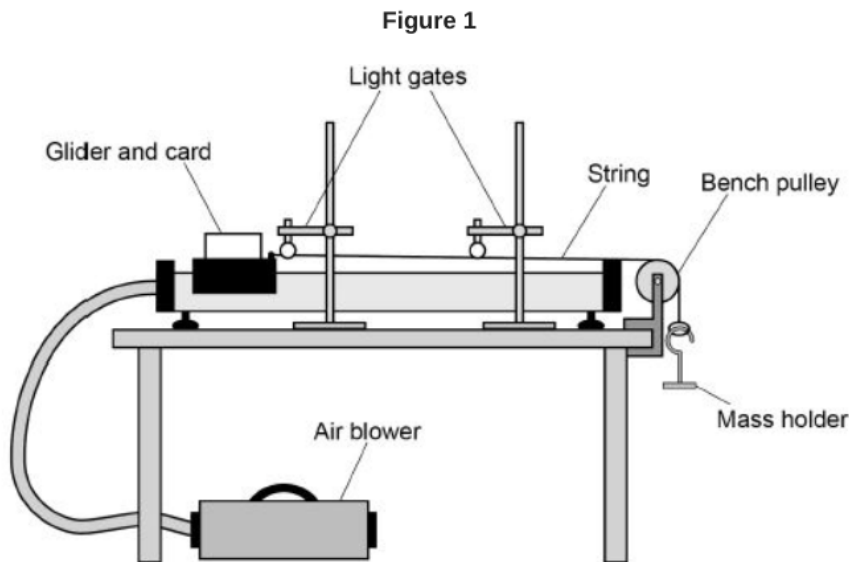


Date.....

A student investigated acceleration using gliders, an air track and light gates.

The air track reduces friction between the glider and the track to zero.

Figure 1 shows the apparatus.



The glider was released from rest and moved along the track.

The mass holder hit the ground before the card passed through the second light gate.

(a) Which **two** statements describe the effect this would have on the glider?

Tick **two** boxes.

Its acceleration would decrease to zero.

Its acceleration would increase.

The resultant force on it would decrease to zero.

The resultant force on it would increase.

Its speed would increase.

The student increased the resultant force acting on the glider by adding more masses to the mass holder.

She calculated the acceleration of the glider for each resultant force.

Each test was done three times.

Table 1 shows the results.

Table 1

Resultant force in N	Acceleration in $\text{m/s}^2$			Mean acceleration in $\text{m/s}^2$
	Test 1	Test 2	Test 3	
0.20	1.3	1.2	1.3	1.26667
0.39	2.6	2.5	2.6	2.6
0.59	3.8	3.8	3.9	3.8
0.78	5.1	5.1	5.1	5.1
0.98	6.4	7.2	6.4	6.7

(c) The student made **two** mistakes in the mean acceleration column.

Identify the mistakes the student made.

Suggest how each mistake can be corrected.

Mistake \_\_\_\_\_

\_\_\_\_\_

Correction \_\_\_\_\_

\_\_\_\_\_

Mistake \_\_\_\_\_

\_\_\_\_\_

Correction \_\_\_\_\_

\_\_\_\_\_

(4)

(d) Write a conclusion for this investigation.

Use the data in **Table 1**

\_\_\_\_\_

\_\_\_\_\_

(1)

Date     /     /

Topic: **Acceleration**

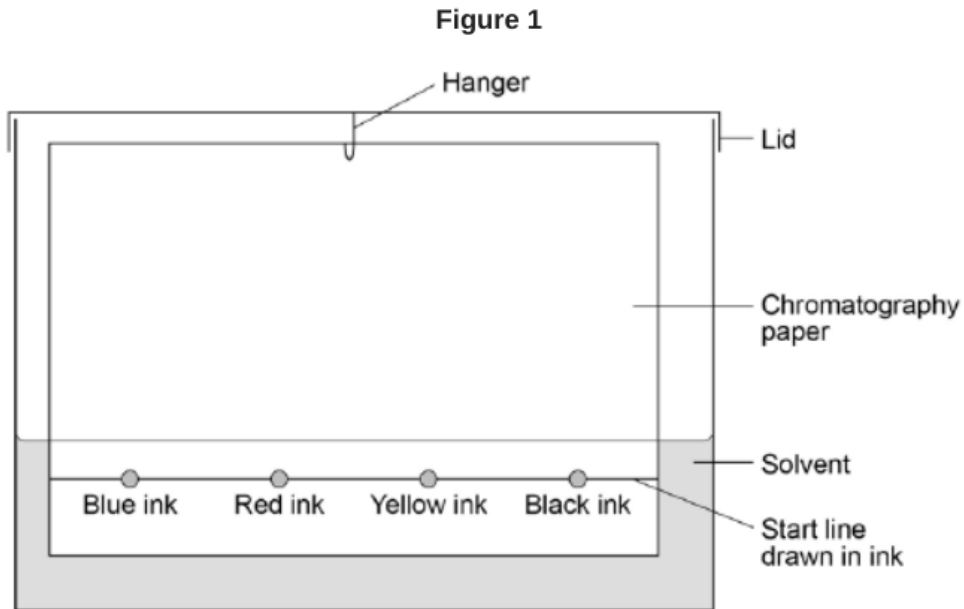
<b>Questions</b>	<b>Notes</b>

**Summary**

Date.....

A student used paper chromatography to investigate the colours in different inks.

Figure 1 shows the apparatus the student used.



(a) The student made **two** mistakes in setting up the apparatus.

Identify the **two** mistakes.

Describe the problem each mistake would cause.

Mistake 1 \_\_\_\_\_

Problem \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Mistake 2 \_\_\_\_\_

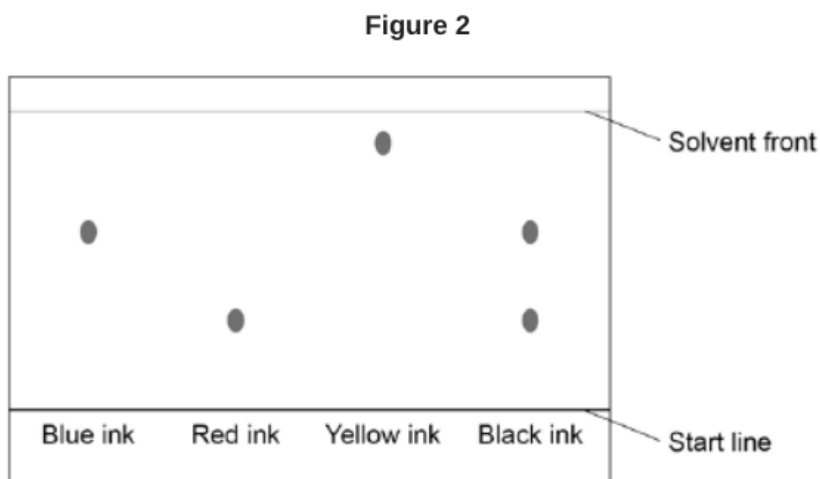
Problem \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) The student then set up the apparatus without making any mistakes.

Figure 2 shows his results.



What colours are in the black ink?

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(1)

(c) Which of the inks is the most soluble in the solvent?

Give a reason for your answer.

Ink \_\_\_\_\_

Reason \_\_\_\_\_

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(2)

**Now complete the revision cards on chromatography**

Date.....

Many biotic and abiotic factors can affect the growth of plants.

(a) Are the factors in **Table 1** biotic or abiotic?

Tick **one** box for each factor.

**Table 1**

<b>Factor</b>	<b>Biotic</b>	<b>Abiotic</b>
Diseases		
Herbivores		
Temperature		
Water		

(2)

Two students investigated the effect of light intensity on the distribution of small plants.

The plants are growing under a tree in a park.

The students made the following hypothesis:

'As you move outwards from a tree there will be more plant growth.'

(b) Explain why the students thought their hypothesis would be correct.

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(3)

Date     /     /

Topic:   **Biotic and Abiotic factors**

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

**Summary**

Date.....

A solar water bag can be used to heat water for an outdoor swimming pool.

A student wanted to find out if the colour of the solar water bag affects the temperature increase of the water inside the bag.

The diagram below shows some of the equipment used.



This is the method used.

1. Fill each bag with water.
2. Place the four bags on the ground outside.
3. After three hours, measure the temperature of the water inside each bag.
4. Repeat steps 1–3 on the next two days.

(a) Suggest three changes the student should make to this method to get valid results.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_

(3)

The student repeated the investigation using an improved method.

The results obtained were valid.

The table below shows the results.

Colour of bag	Temperature increase in °C			
	Day 1	Day 2	Day 3	Mean
Black	44.0	31.4	43.4	39.6
Pale blue	38.5	23.6	38.1	33.4
Pale green	37.9	23.7	37.7	33.1
White	25.3	23.4	24.2	X



- (b) The student used a thermometer to measure the temperature of the water inside each bag.  
What was the resolution of the thermometer?

Resolution = \_\_\_\_\_ °C

(1)

- (c) Suggest **one** reason why the temperatures increased less on Day 2 than on Day 1 and Day 3.

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(1)

- (d) Calculate the mean temperature increase for the white bag.

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Mean temperature increase = \_\_\_\_\_ °C

(1)

- (e) Which colour of bag would be best to use to heat water?

Give a reason for your answer.

Colour \_\_\_\_\_

Reason \_\_\_\_\_

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(2)

(Total 8 marks)

**Now complete the revision cards on IR radiation**

Date.....

A student investigated the rate of the reaction between magnesium and hydrochloric acid. The reaction produced a gas.

(a) Which gas is produced in the reaction?

Tick (✓) **one** box.

Carbon dioxide

Chlorine

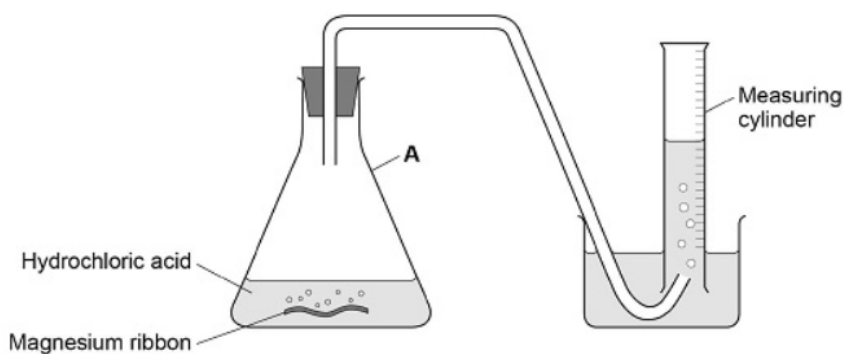
Hydrogen

Oxygen

(1)

Figure 1 shows the apparatus used.

Figure 1



(b) What is the piece of equipment labelled A?

\_\_\_\_\_

(c) The student saw that a chemical reaction was taking place.

Give **two** observations that would show a chemical reaction was taking place.

1 \_\_\_\_\_

\_\_\_\_\_

2 \_\_\_\_\_

\_\_\_\_\_

(2)

(b) At the start of the investigation the volume of gas was  $0 \text{ cm}^3$

The student took readings at 20-second intervals

Readings for the volume of gas were  $24 \text{ cm}^3$ ,  $44 \text{ cm}^3$ ,  $59 \text{ cm}^3$ ,  $70 \text{ cm}^3$ ,  $76 \text{ cm}^3$  and  $79 \text{ cm}^3$

Draw a results table for the investigation.

Include the student's results in the table.

Date     /     /

Topic Rates of reaction - collecting gas

Questions	Notes

Summary

# WEEK 6 Half Term 4

Date.....

Some animals are adapted to survive in very cold conditions such as the Arctic.

Explain how the adaptations of Arctic animals help them to survive in cold conditions.

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(Total 6 marks)

**Now complete the revision cards on adaptations**











<b>Revision Card - Week 2 Half Term 3</b> <b>Contraception</b> <ol style="list-style-type: none"><li>1. Which hormones are produced in the ovaries?</li><li>2. Why are some non-hormonal methods of contraception irreversible?</li><li>3. Give an example of a contraceptive method that is a barrier, to stop the sperm reaching the egg.</li><li>4. What is an IUD?</li><li>5. Name a method of hormonal contraception.</li></ol>	<b>Answers</b>
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<b>Revision Card - Week 4 Half Term 3</b> <b>Life cycle assessments</b> <ol style="list-style-type: none"><li>1. What is the first stage in a life-cycle assessment?.</li><li>2. What is the second stage in a life-cycle assessment?</li><li>3. What is the third stage in a life-cycle assessment?</li><li>4. What is the final stage in a life-cycle assessment?</li><li>5. Where do the raw materials come from to make a plastic bag?</li></ol>	<b>Answers</b>
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<b>Revision Card - Week 6 Half Term 3</b> <b>Electromagnets</b> <ol style="list-style-type: none"><li>1. Name the equipment needed to make an electromagnet.</li><li>2. Define the term solenoid.</li><li>3. What causes a magnetic field.</li><li>4. Give 2 advantages of using an electromagnet in a scrapyards.</li><li>5. Draw a diagram of an electromagnet.</li></ol>	<b>Answers</b>
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**Revision Card - Week 2 Half Term 4  
Chromatography.**

1. Name the stationary phase
2. Name the mobile phase.
3. Why is the start line drawn in pencil?
4. Why is a lid often used?
5. What is the equation to calculate the RF value?

**Answers**

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**Revision Card - Week 4 Half Term 4  
IR investigations**

1. Define IR radiation.
2. Which word describes the process of giving out radiation?
3. Which word describes the process of taking in radiation?
4. Which colour is the best absorber of radiation?
5. Name of the piece of equipment that is a cube with different surfaces.

**Answers**

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**Revision Card - Week 6 Half Term 4  
Adaptations**

1. Define adaptation.
2. What is an extremophile?
3. Name 2 adaptations of a polar bear.
4. Name 2 adaptations of a camel that enables it to survive in the desert.
5. The 3 types of adaptation:
  - Structural
  - \_\_\_\_\_
  - \_\_\_\_\_

**Answers**

Aspire  
ACHIEVE  
Thrive

Develop your character



Aspire Achieve Thrive