

NAME:	SCIENCE TEACHER:	9C
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SCIENCE

Year 9 Examination 2010

9C – 40 marks

**Make sure that you have answered all the questions in paper 9B
before you start this paper**

Time allowed for both examinations: 2 hours

Answer all questions in the spaces provided on the paper.

You may use a calculator.

Show all your working in calculations; marks are awarded for it.

Give units for all answers (eg kg or m) unless they are already provided.

For Teacher Use

Question	1	2	3	4	5	6	Total
Marks gained							
Marks available	8	7	5	7	7	6	40

ANSWER ALL THE QUESTIONS IN THE SPACES PROVIDED

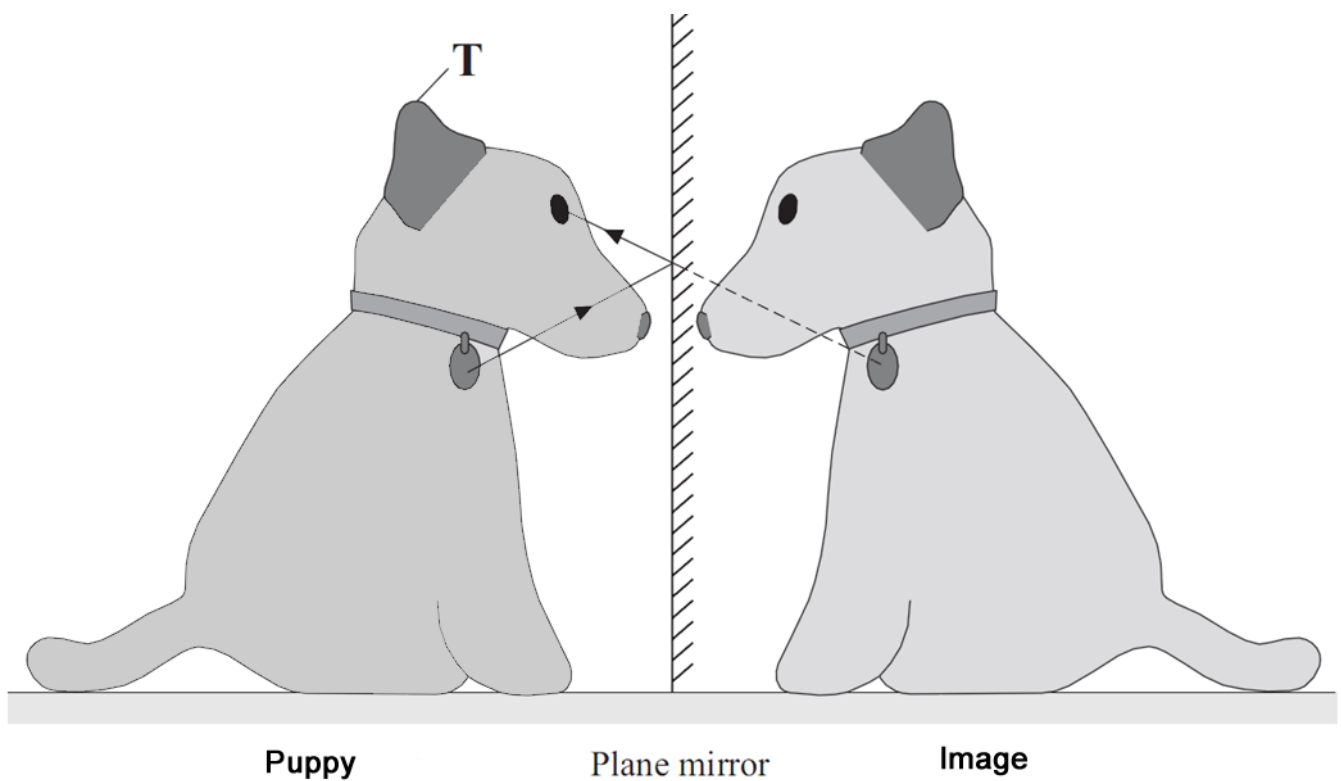
Question One: Seeing and Hearing [8 marks]

A puppy can see an image of himself in a plane mirror. The diagram shows how the puppy can see his disc.

- (a) A student says “the image of the puppy is same size as the real puppy”. Write down two more correct statements about the image of the puppy.

1.	
2.	

- (b) On the diagram, use a ruler to draw a ray to show how the puppy can see the top of his ear, which is marked as T.



The diagram shows a bat in a garden at night.

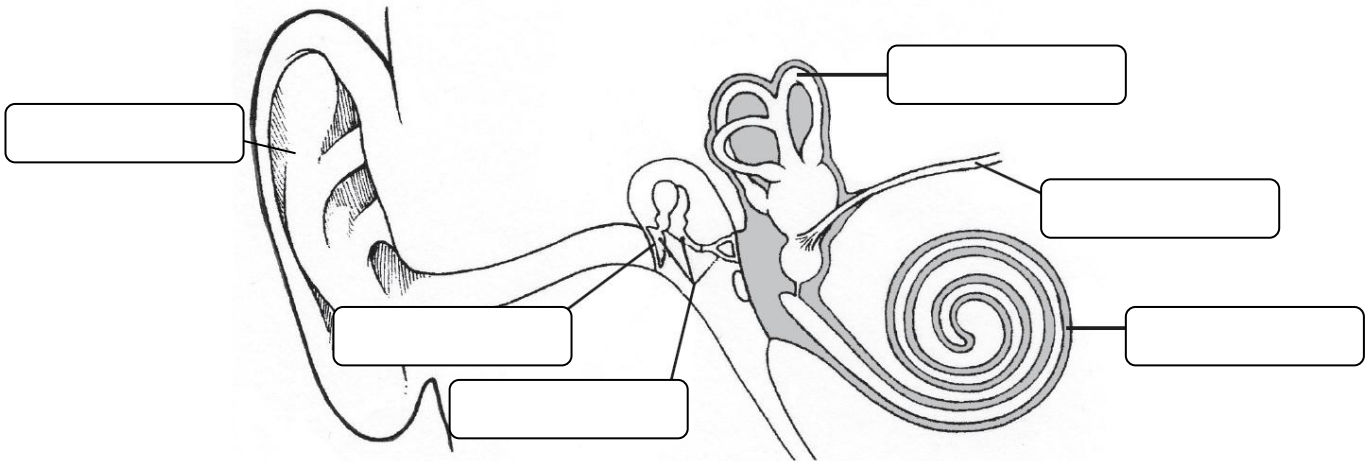


- (c) When it is completely dark the child cannot see the bat but if the moon is visible in the sky she can see the bat. Explain why the child can see the bat when the moon is visible in the sky.

- (d) When the security light is switched on a shadow of the bat is formed on the garage wall. If the bat moves nearer to the garage wall, what will happen to the size of its shadow? Show this by drawing on the diagram above.

The diagram below represents the human ear.































(e) Name any **TWO** of the parts on the diagram. Incorrect answers will cancel out correct answers!



(f) Discuss the advantage(s) of hearing with two ears rather than one.

Question Two: Plants [7 marks]

Some students counted the plants in three areas of land, A, B and C. Their results are shown below.

area A	area B	area C
         	         	         

Key to Plant types

Clover 
 Daisy 
 Dandelion 
 Violet 

- (a) List the MOST common and LEAST common plant found in area B.

Most common		Least common	
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- (b) Design a results table to show the results for areas A, B and C and fill in the results for just Area A.

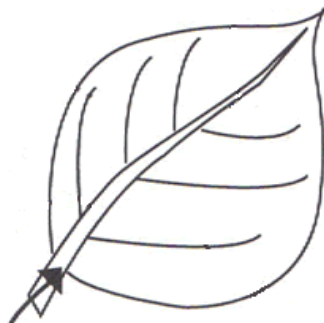
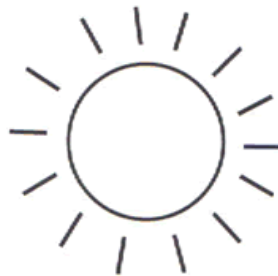
- (c) What sort of graph (line or bar) would be the best to display these results? Explain why you chose this type of graph.

I would choose a line / bar (circle answer) graph because...

- (d) Plants are producers. Discuss how plants make their own food. Some of the words you might find useful are

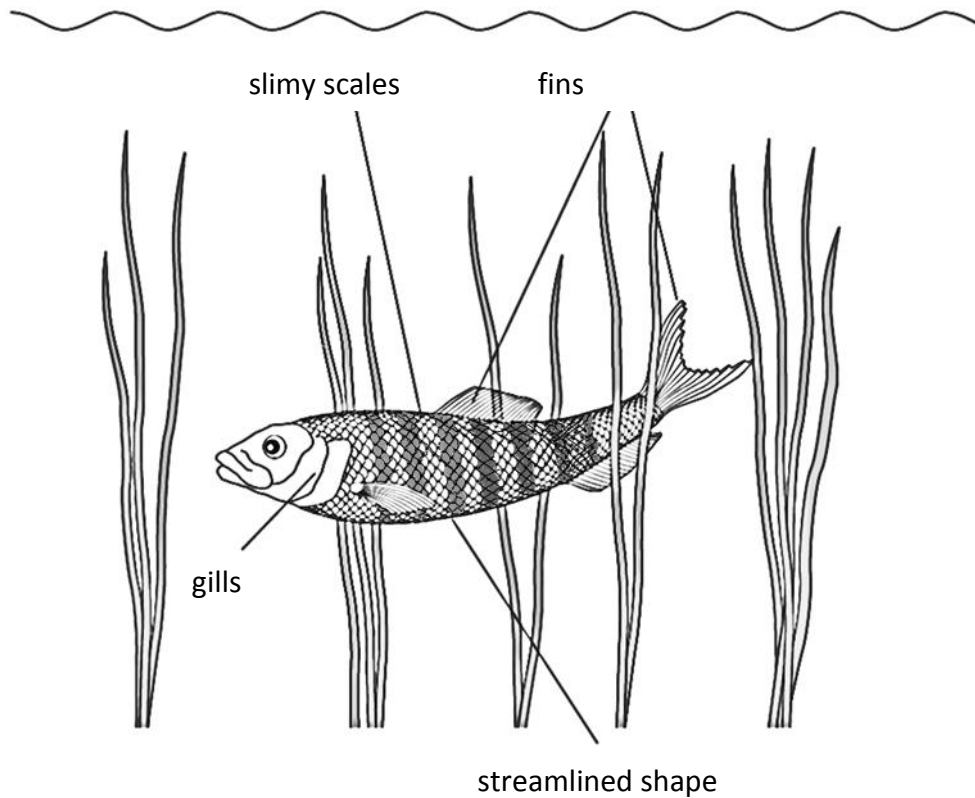
• carbon dioxide • chlorophyll • chloroplast • energy • glucose • green • leaf • oxygen •
• photosynthesis • roots • sugar • sunlight • starch • water •

You may label the diagram if it helps.



Question Three: Down by the sea [6 marks]

Fish have adaptations that help them live in water.



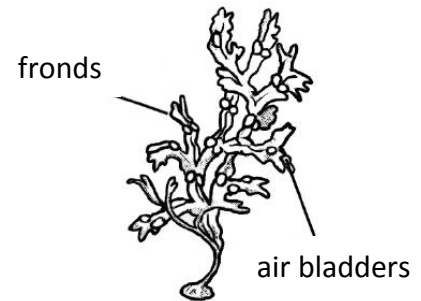
- (a) Choose a labelled adaptation and describe how it helps the fish to live in water.

Adaptation:
This helps the fish to live in water by...
This adaptation is: <i>structural</i> <i>behavioural</i> <i>functional</i> (circle your answer)

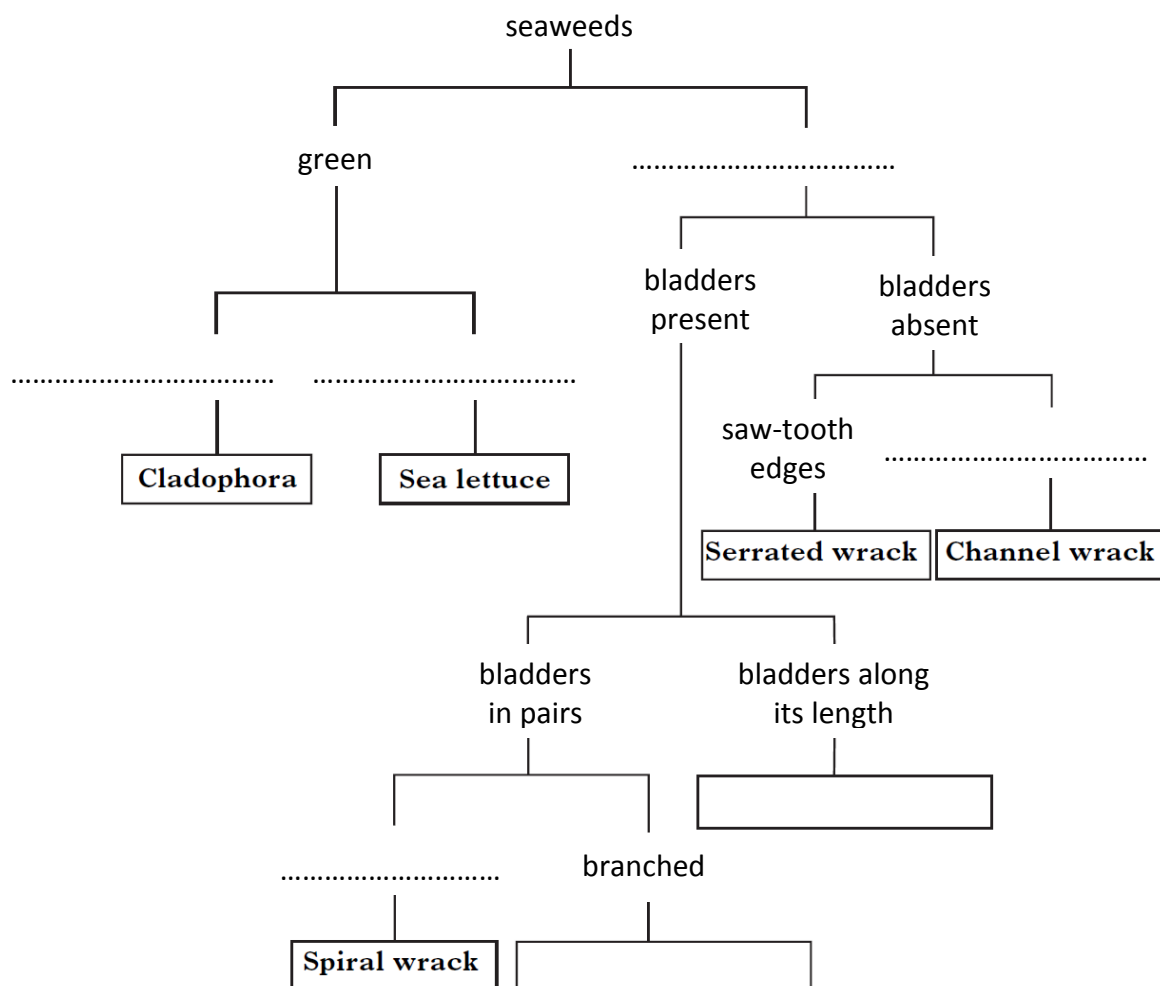
- (b) Suggest how the banding pattern on the skin of the fish might help it survive.

- (c) Seaweed is a common plant in the sea. Some features of common seaweeds are shown in the table below.

Use the information in the table to complete the key below by writing the correct feature on each dotted line and the correct seaweed names in the empty boxes.

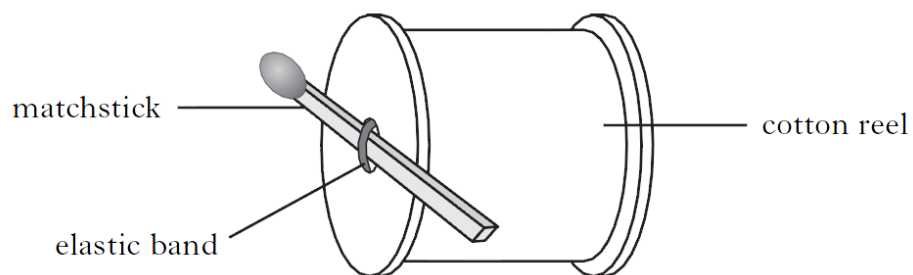


<i>Seaweed</i>	<i>Colour</i>	<i>Shape</i>	<i>Air bladders</i>
Bladder wrack	brown	branched	in pairs
Channel wrack	brown	grooved	absent
Cladophora	green	long and thin	absent
Egg wrack	brown	branched	along its length
Sea lettuce	green	flat	absent
Serrated wrack	brown	saw-toothed edges	absent
Spiral wrack	brown	twisted	in pairs



Question Four: Energy [7 marks]

Edward made a model tank from a cotton reel, an elastic band and a matchstick.



When he turned the matchstick and let go, the tank moved forward.

He investigated how far the tank travelled using different numbers of turns of the matchstick and different thicknesses of elastic band.

His results are shown below.

Number of turns of the matchstick	Thickness of the elastic band	Distance travelled (cm)
5	thick	35
10	thick	69
15	thick	101
5	thin	23
10	thin	44
15	thin	69

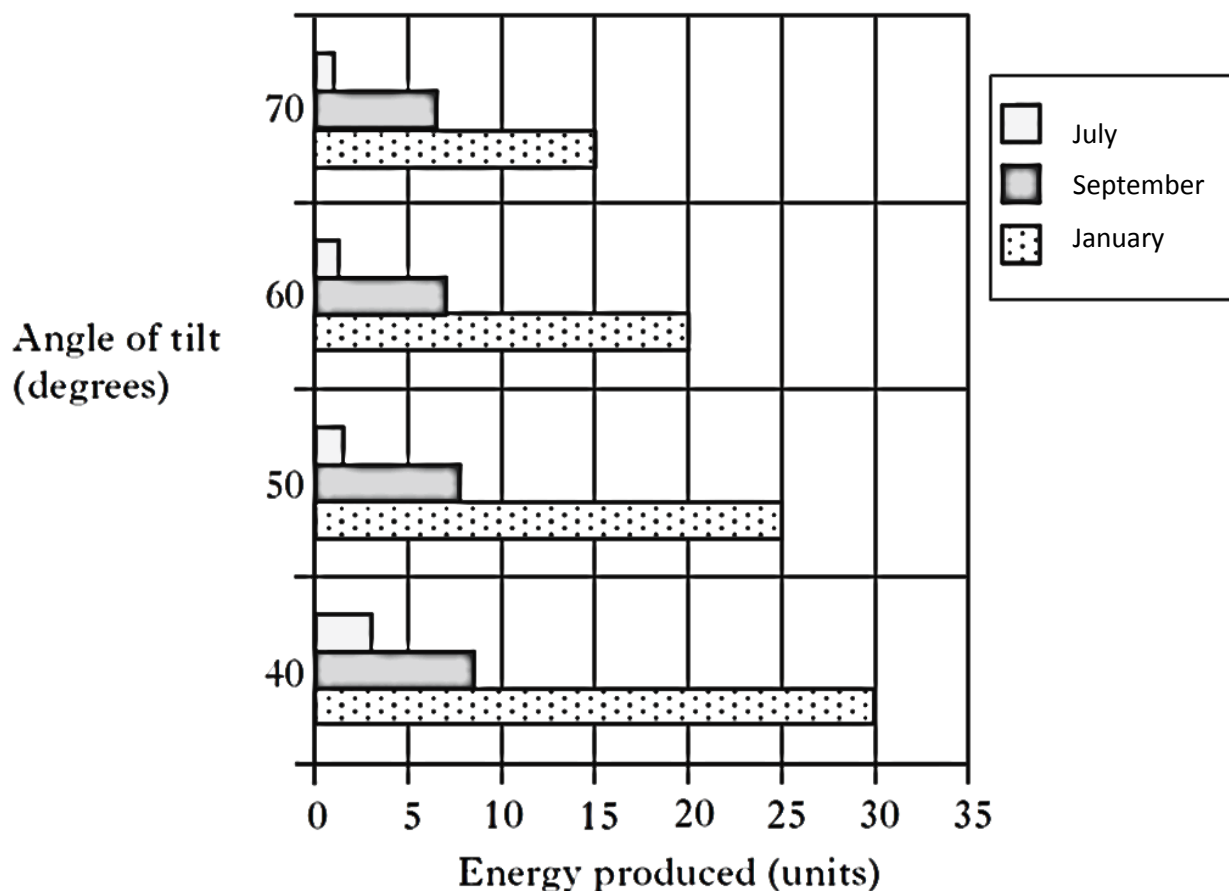
(a) Draw **two** conclusions from these results. (It is not necessary to do any calculations).

1.
2.

(b) How could Edward improve the reliability of his results?

Due to increasing population and the need for more and more industry, demand for energy is steadily increasing. Renewable energy sources are becoming more important to us.

The graph below shows how the energy produced by a solar cell during different months of the year changes as the solar cell is tilted to different angles.



(c) Draw **two** conclusions from these results.

1.
2.

(d) Predict how much energy could be produced by a solar cell tilted to 55 degrees during the month of January. Explain how you came to this answer.

My prediction:
Explanation:

Question Five: Materials and their properties [7 marks]

(a) Study the Key opposite.

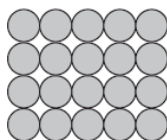
The diagrams below show the arrangement of atoms in each of four substances, **A**, **B**, **C** and **D**, at room temperature (20 °C).

Key	
○	An atom of oxygen
●	An atom of carbon
●	An atom of iron
⊗	An atom of hydrogen

Substance **A**



Substance **B**



Substance **C**



Substance **D**



Match substances, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table. Each letter can only be used once.

Description of the substance		Letter
1	It is a compound that is a gas	
2	It is an element that is a gas.	
3	It is an element that is a solid	
4	It is a compound that is a liquid	

(b) Use a ruler to match each property with its correct description. (The first one has been done for you)

Property

Thermal conductivity

Strength

Wear resistance

Elasticity

Hardness

Flammability

Flexibility

Description

Ability to burn

Ability to bend without breaking

Ability to allow heat to flow through a material

Ability to stretch and then return to original shape

Ability to resist damage caused by impact

Ability to support heavy loads without breaking

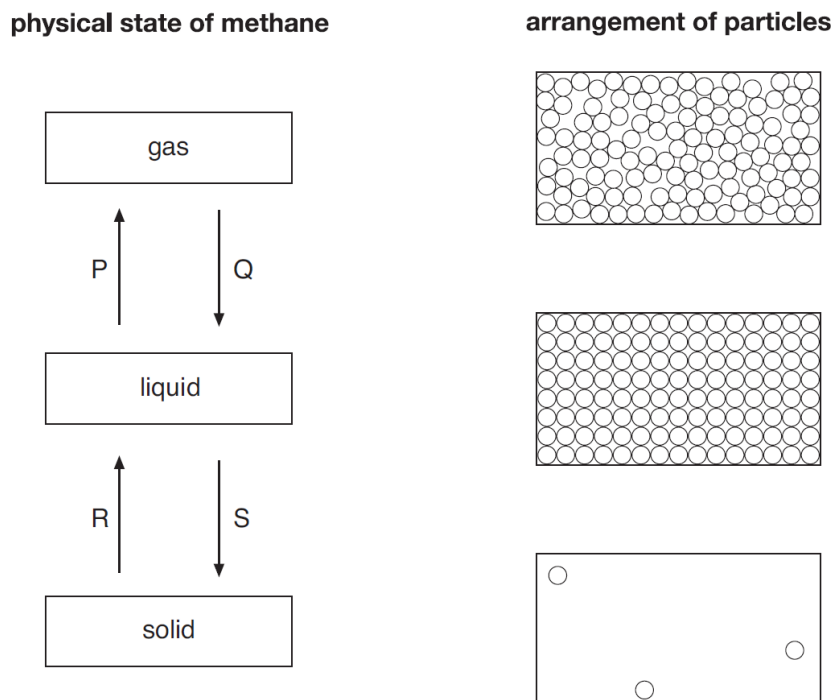
Ability to resist damage caused by rubbing

Methanol is sometimes used in antifreeze. It can be added to water in car windscreen wash-bottles to prevent the water from freezing in cold conditions.

(c) The label on the bottle of antifreeze has two hazard warning symbols. Discuss why you would need to take precautions when using this antifreeze?



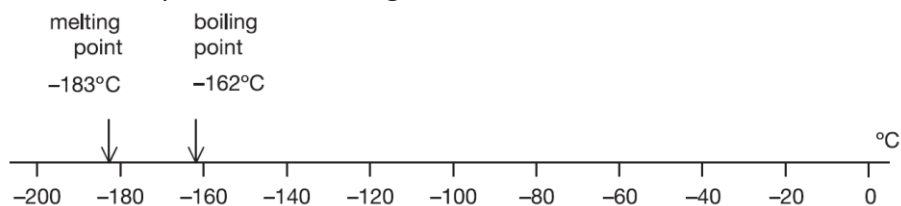
- (d) Methane can be a gas, a liquid or a solid. In the diagram below, arrows P, Q, R and S represent changes of state. The boxes on the right show the arrangement of particles of methane in the three different physical states. Each circle represents a particle of methane.



- (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?

- (e) Methane is the main compound in natural gas.



Methane has three physical states: solid, liquid and gas.

Explain how you can work out the physical state (solid, liquid or gas) of methane at -170°C?

Question Six: [6 marks]

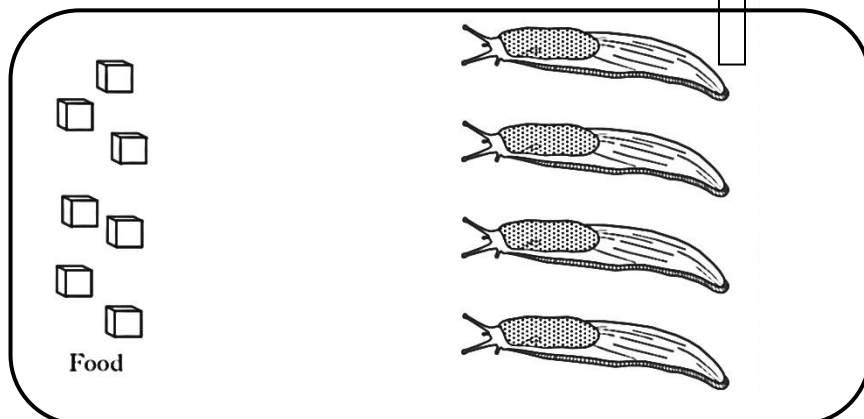
An investigation was set up to examine the behaviour of slugs.

During the investigation the slugs moved towards the food.

No slugs are to be harmed during this experiment!!

Two possible hypotheses for the movement of the slugs are:

1. The slugs saw the food and moved towards it.
2. The slugs smelled the food and moved towards it.



- (a) How could the investigation be improved to show which hypothesis was correct?
- Draw a labelled diagram of how the experiment might be set up using materials found in the laboratory.
 - Why would it be good experimental practice to use several slugs rather than just one?
 - How would you make sure your results are reliable?

Space for diagram:

More space on next page

More space on next page

- (b) Give one example of an abiotic factor which can affect the behaviour of a named animal you have studied this year and describe the response of the animal to that factor.

Animal:	snail	earthworm	woodlice (circle your answer)
Abiotic factor:			
Response:			

NOW CHECK YOUR ANSWERS