

NAME:	SCIENCE TEACHER:	<b>9C</b>
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# SCIENCE

## Year 9 Examination 2009

**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.

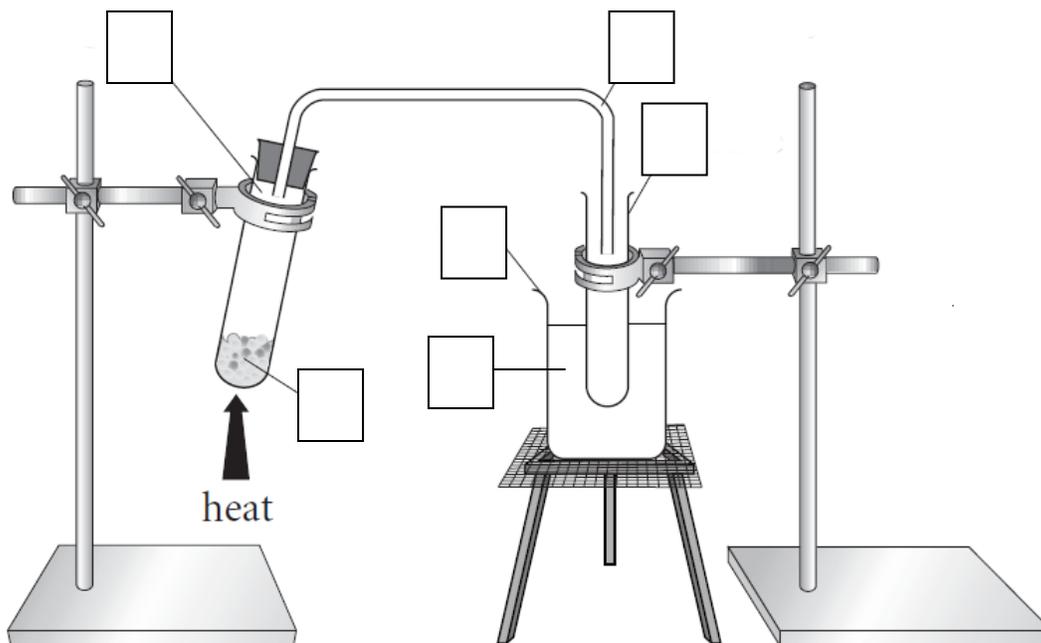
*For Teacher Use*

<i>Question</i>	1	2	3	4	5	6	7	8	9	10	<i>Total</i>
<i>Marks gained</i>											
<i>Marks available</i>	6	3	2	4	4	3	4	5	4	5	40

**Question One. [6 marks]**

Sarah measured 10 mL of sea water into a boiling tube. She arranged the apparatus as shown in the diagram. She heated the bottom of the boiling tube. She watched what happened in the different parts of the apparatus. When all the water had evaporated from the boiling tube, she stopped heating. Once the apparatus had cooled, she measured the volume of pure water collected in the test tube – it was 6 mL. She looked carefully at the contents of the boiling tube.

(a) Label the diagram by placing **A** to **F** in the boxes.



**A beaker    B boiling tube    C iced water    D delivery tube    E sea water    F test tube**

(b) Describe what happened to the water in the boiling tube.


(c) Describe what happened in the test tube.


(d) What might Sarah **see** that would explain why she collected less water than she started with?


(e) Would you expect to get more or less pure water in the test tube if Sarah wrapped cold cloths round the delivery tube? Explain your answer.

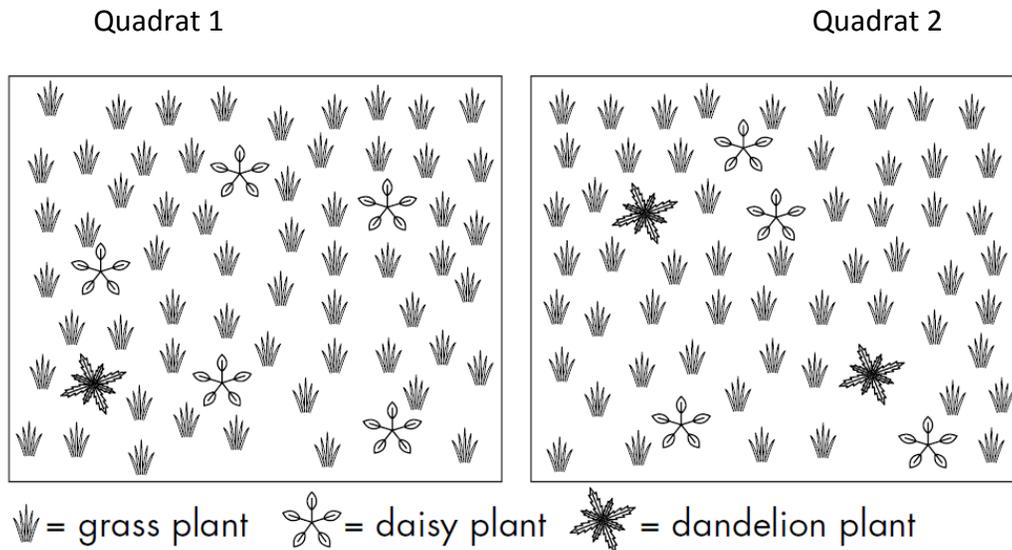

(f) Describe what would be left behind in the boiling tube, and why.




**Question Two. [3 marks]**

A lawn is a habitat. Three kinds of plants on a lawn are grass, daisy and dandelion. There are more grass plants than any other kind of plant. The total number of any particular plant in a habitat is called its 'population'.

Some pupils used a 1-metre square called a quadrat to count the populations of plants on part of a small lawn. They did this twice, and drew the diagrams below.



(a) What is meant by the term habitat?


(b) Count the daisy and dandelion plants and complete the table. One has been done for you.

Quadrat	Number of grass plants	Number of daisy plants	Number of dandelion plants
1		5	
2			
Total in quadrats 1 & 2			

(c) If a lawn is ten times as big as these two quadrats put together, how many daisy plants would you expect to find?


**Question Three. [2 marks]**

Katie has a cold. Her dad makes her a hot lemon drink using some yellow powder.

He mixes the powder with some hot water. The powder dissolves in the hot water.



(a) Put a ring round the word that best describes the water.

**solute • solvent • soluble • solitude**

(b) Put a ring round the word which best describes the powder.

**solute • solvent • solution • insoluble**

(c) Put a ring round the word which best describes the hot lemon drink.

**solvent • solution • cloudy • yellow • insoluble • colourless**

**Question Four. [4 marks]**

This question is about energy.

(a) Look at the picture below.

Decide which types of energy are being used or produced.



Energy being <b>used</b>	Energy being <b>produced</b>

Electricity can be generated using energy from the wind. A company wants to build a new wind farm. Not everyone thinks that this is a good idea.



(b) What arguments could the company give to persuade people that a wind farm **is** a good idea?

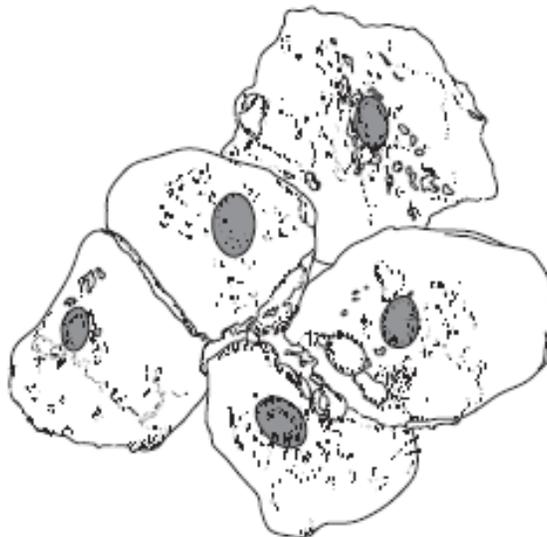
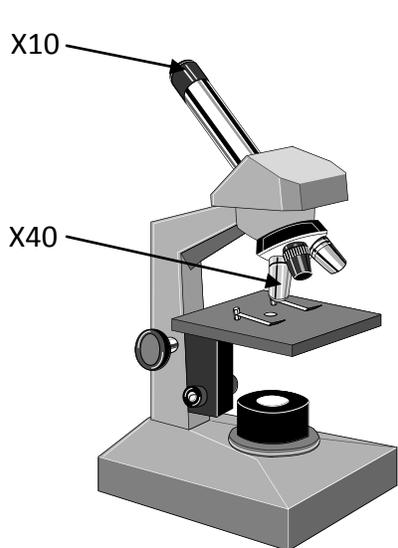

(c) What reasons may be given by the people who think that a wind farm **is not** a good idea?


**Question Five. [4 marks]**

Scott is learning about cells. He uses a microscope to look at some of his cheek cells.

The **picture** shows what he can see.

He used a microscope with an eye piece of magnification x10, and an objective lens with magnification x40



- (a) Draw a **scientific diagram** of two cheek cells.
- (b) Label your diagram. Choose suitable words from this list.

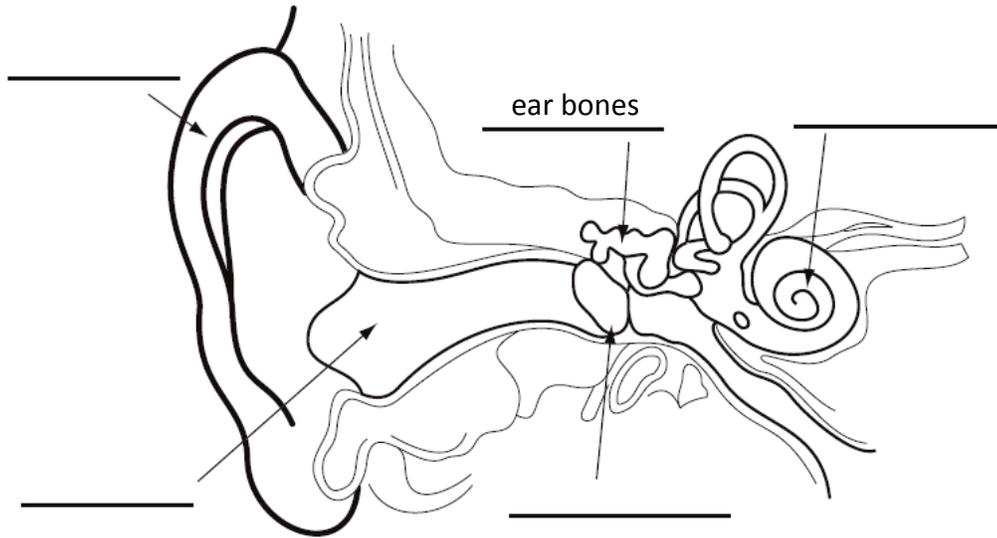
**cell membrane • cell wall • chloroplast • cytoplasm • nucleus • large vacuole**

**Cheek Cells**

Magnification: X\_\_\_\_\_

**Question Six. [3 marks]**

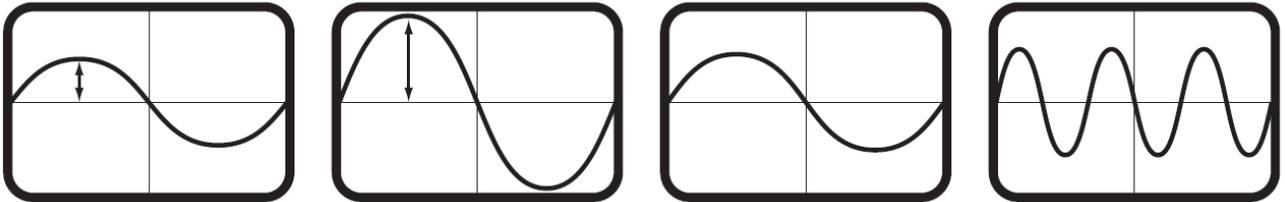
(a) Label the diagram of the ear. Choose from the words provided



outer ear • cochlea • ear drum • ear canal • semicircular canals • Eustachian tube

(b) Below are some pictures of sound waves being shown on a CRO (cathode ray oscilloscope). Match the diagrams with their labels given below.

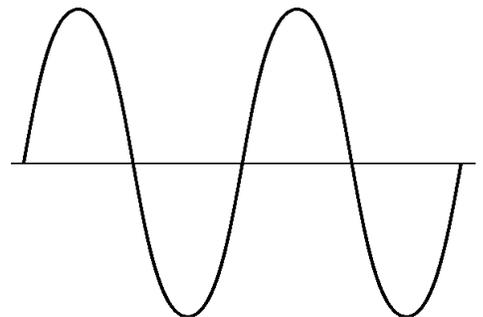
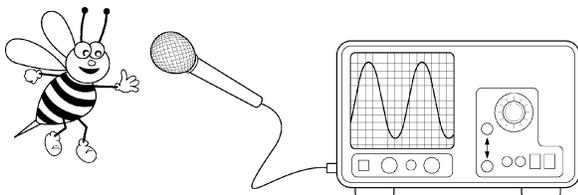
low-pitched sound • high-pitched sound • loud sound •



quiet sound			
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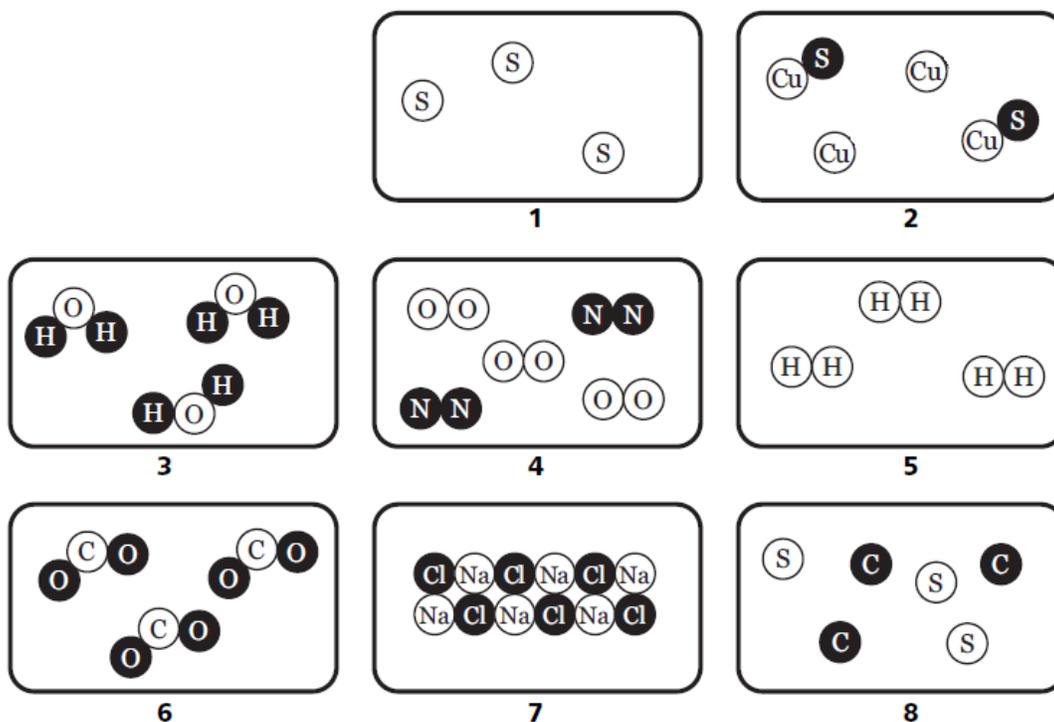
(c) Bees make a buzzing sound by beating their wings very quickly. This trace was made by a bee beating its wings 10 times a second.

On the diagram **opposite**, draw the trace of another bee which is beating its wings at **twice the frequency**, but **more quietly**.



**Question Seven. [4 marks]**

Particles are found as elements, compounds and mixtures. Look at the boxes below.



- (a) Divide diagrams 1 – 8 into the following categories. Each category can be used once, more than once or not at all.

Element	Mixture of elements	Compound	Mixture of element & compound	Mixture of compounds

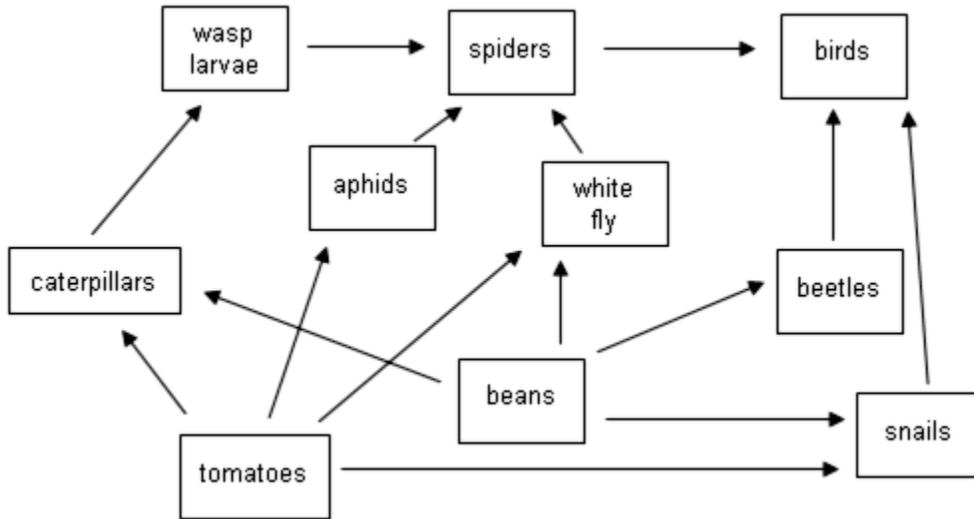
- (b) Name one of the elements shown.

- (c) Name one of the compounds shown.



**Question Eight. [5 marks]**

This task is about food webs.



(a) On the food web what do the arrows represent?

(b) By using **examples from the food web**, explain what is meant by

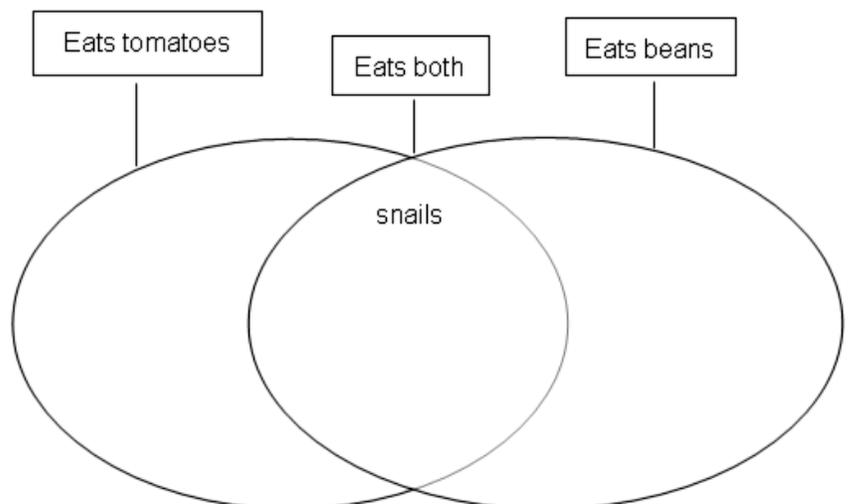
(i) predator

(ii) secondary consumer

(c) Use the food web to complete the Venn diagram, to show

- which animals eat beans,
- which eat tomatoes, and
- which eat both.

It has been started, showing that snails eat both tomatoes and beans.



- (d) The gardener uses a spray that kills aphids and white fly. Choose an animal in the food web and explain how this will affect them.

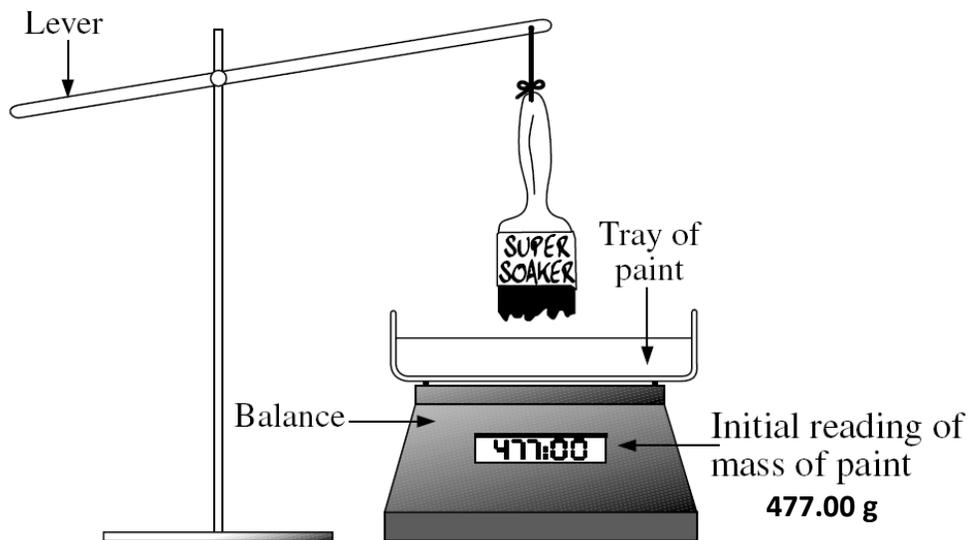
Animal:

- (e) Which animal will probably disappear when all the bean plants are pulled out? Why?

Animal:

**Question Nine. [4 marks]**

Matthew used the equipment in the diagram to test a paintbrush. He was trying to prove that one brand of paintbrush was better than other brands in picking up paint. Matthew lowered the brush into the paint and raised it again. The new reading on the balance was then recorded. This was repeated for four different brands of paintbrush.

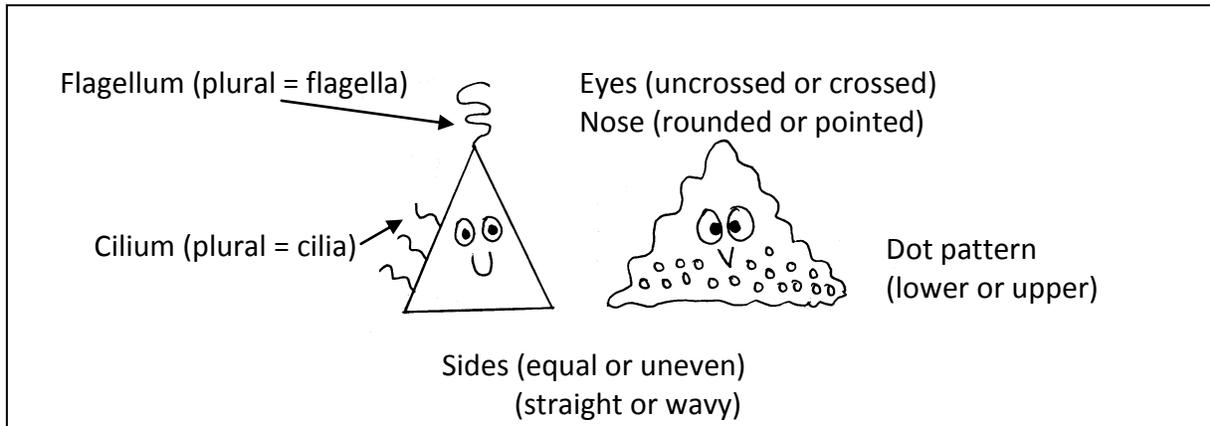


(a) Design a results table that would be suitable for the results obtained by Matthew after testing all four brushes.

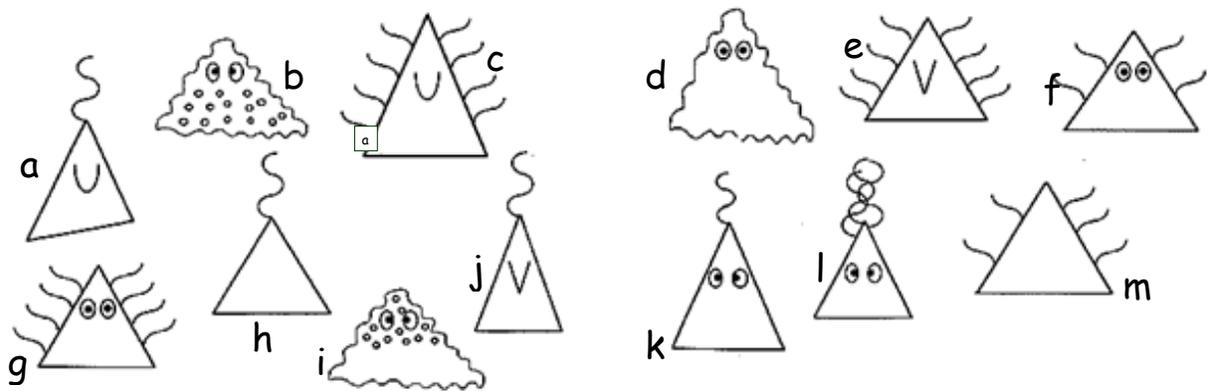
(b) Explain carefully how the readings on the balance will allow Matthew to calculate how much paint each brush picked up.


**Question Ten. [5 marks]**

With the millions of living organisms in the world, scientists need a method of identifying unknown organisms. In this question you will be using a dichotomous key to identify unknown organisms.



Here are thirteen *Triangulum* animals, labeled a. to m.



- (a) Geoff wants to divide the *Triangulum* animals into Group One and Group Two. Group One have cilia. Group Two do not have cilia. Write down the members of Group One and Two. (Use the letters a – m).

Group One: <b>Have cilia</b>	Group Two: <b>Do not have cilia</b>

- (b) By looking at the *Triangulum* animals, think of **another feature** that could be used to divide them into two groups, Group 3 and Group 4. Complete the table for the feature you have chosen and write down the members of each group.

Group Three: _____	Group Four: _____

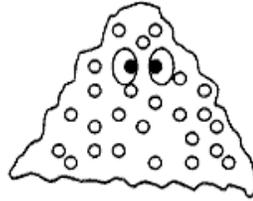
(c) Use the dichotomous key below to identify the three *Triangulum* animals drawn below.

- |     |  |                                  |
|-----|--|----------------------------------|
| 1.  | A. Sides are straight lines                    | Go to 2                          |
|     | B. Sides are wavy lines                        | Go to 10                         |
| 2.  | A. Has no eyes                                 | Go to 3                          |
|     | B. Has eyes                                    | Go to 5                          |
| 3.  | A. Has flagella for movement                   | Go to 4                          |
|     | B. Has cilia for movement                      | Go to 7                          |
| 4.  | A. The three sides are of equal length         | <i>Triangulum equalius</i>       |
|     | B. The three sides are not of equal length     | Go to 12                         |
| 5.  | A. Has crossed eyes                            | Go to 6                          |
|     | B. Eyes not crossed                            | Go to 9                          |
| 6.  | A. Has a single flagellum for movement         | <i>Triangulum monoflagelleum</i> |
|     | B. Has two or more flagella for movement       | <i>Triangulum polyflagelleum</i> |
| 7.  | A. Total number of cilia for movement are odd  | <i>Triangulum oddcilus</i>       |
|     | B. Total number of cilia for movement are even | Go to 8                          |
| 8.  | A. Has a pointed nose                          | <i>Triangulum pointiatus</i>     |
|     | B. Has a rounded nose                          | <i>Triangulum roundiatus</i>     |
| 9.  | A. Has two cilia on each side for movement     | <i>Triangulum biciliatus</i>     |
|     | B. Has more than two cilia on each side        | <i>Triangulum polycilius</i>     |
| 10. | A. Has crossed-eyes                            | Go to 11                         |
|     | B. Eyes not crossed                            | <i>Triangulum waveus</i>         |
| 11. | A. Lower half of the body has a dot pattern    | <i>Triangulum ventrodotteus</i>  |
|     | B. Upper half of the body has a dot pattern    | <i>Triangulum dorsalidotteus</i> |
| 12. | A. Has a pointed nose                          | <i>Triangulum pointinoseum</i>   |
|     | B. Has a rounded nose                          | <i>Triangulum roundinoseum</i>   |

(d) Draw a diagram of *Triangulum roundiatum* in the space below.

(e) A new species of *Triangulum* animal was discovered by a Year 9 student in a sample of stagnant pond water. The dichotomous key must be modified to identify the new animal shown below.



(i) Between which steps in the key should the new feature (characteristic) be added?

5 & 6    8 & 9    10 & 11

(ii) Write down the extra step (pair of questions) you would have to add to the key to make it work.


(iii) Suggest a scientific name for this new organism.

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