



General Certificate of Secondary Education

Centre Number

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Candidate Number

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Biology

Unit 3 Practical Skills
Booklet B
Foundation Tier



[GBL32]

GBL32

Assessment

TIME

1 hour.

Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **5(a)**.



1 (a) A student used the following method to prepare a thin layer of onion cells for viewing under the microscope.

(i) Use words from the box to complete the steps in the method.

scissors	stain	Petri dish	forceps
coverslip	alcohol	microscope slide	

Method

1. Use _____ to place a thin layer of onion cells on to a _____.
2. Add one drop of _____ to the onion cells to make them easier to see.
3. Lower a _____ on to the top of the onion cells using a mounted needle to prevent the cells drying out. [4]

The student then viewed the onion cells at low power ($\times 10$).

(ii) Explain why the student viewed the onion cells using the low power ($\times 10$) objective lens before using the high power ($\times 40$) objective lens.

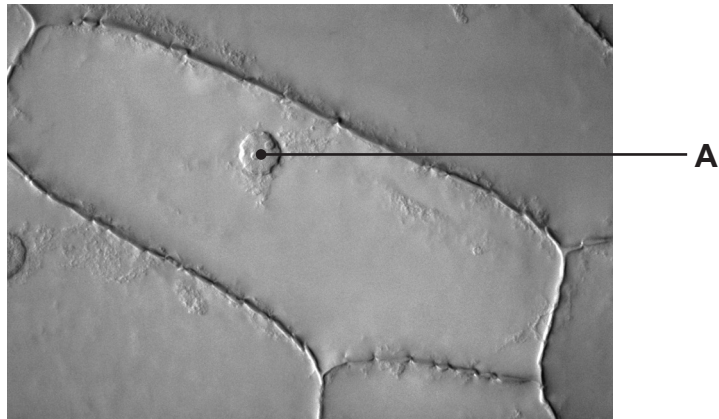
_____ [1]



(iii) Explain why the layer of onion cells needs to be thin.

[1]

The photograph shows some onion cells when viewed under a microscope.



Source: © Power and Syred / Science Photo Library

Look at the photograph.

(b) Name part **A** and give its function.

Name _____

Function _____

[2]

[Turn over

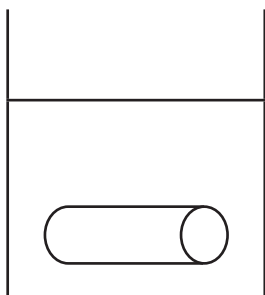


- 2 A group of students set up an experiment to investigate the effect of placing potato cylinders into different concentrations of sugar solution.

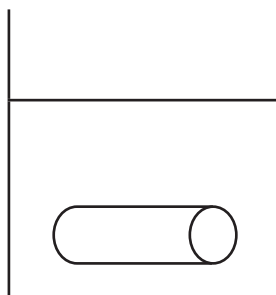
They cut the cylinders to a length of 50 mm at the start of the experiment.

They then placed each cylinder in a beaker containing a different concentration of sugar solution.

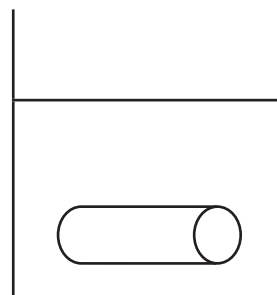
0% sugar solution



5% sugar solution



10% sugar solution



After 24 hours the students removed the potato cylinders and measured their lengths.

The table shows the students' results.

(a) Complete the table by

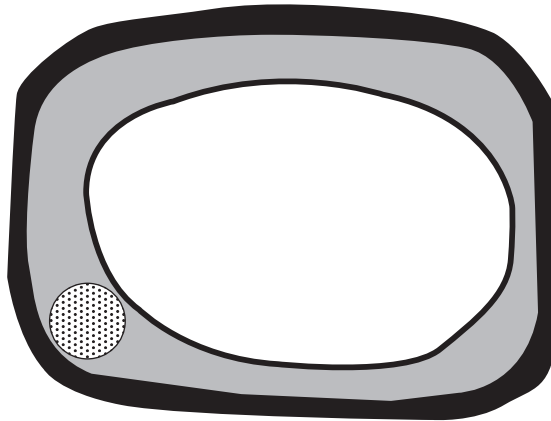
- filling in the missing column heading, including units.
- filling in the missing sugar concentration.
- calculating and filling in the missing potato cylinder length.

Concentration of sugar solution / %			Change in length of potato cylinder / mm
	at the start	after 24 hours	
0	50	57	+7.0
	50	53	+3.0
10	50		-4.0

[4]



- (b) The diagram shows a cell from the potato cylinder after 24 hours in 0% sugar solution.

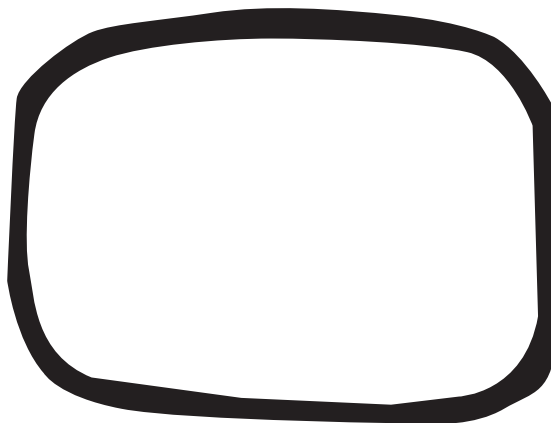


Look at the diagram.

- (i) On the diagram, use a line labelled **X** to show the part of the potato cell that stops it from bursting. [1]

- (ii) What term describes the appearance of this cell? [1]

- (iii) Complete the diagram to show the appearance of **this cell** if it had been placed in the 10% sugar solution for 24 hours. [3]



[3]

[Turn over



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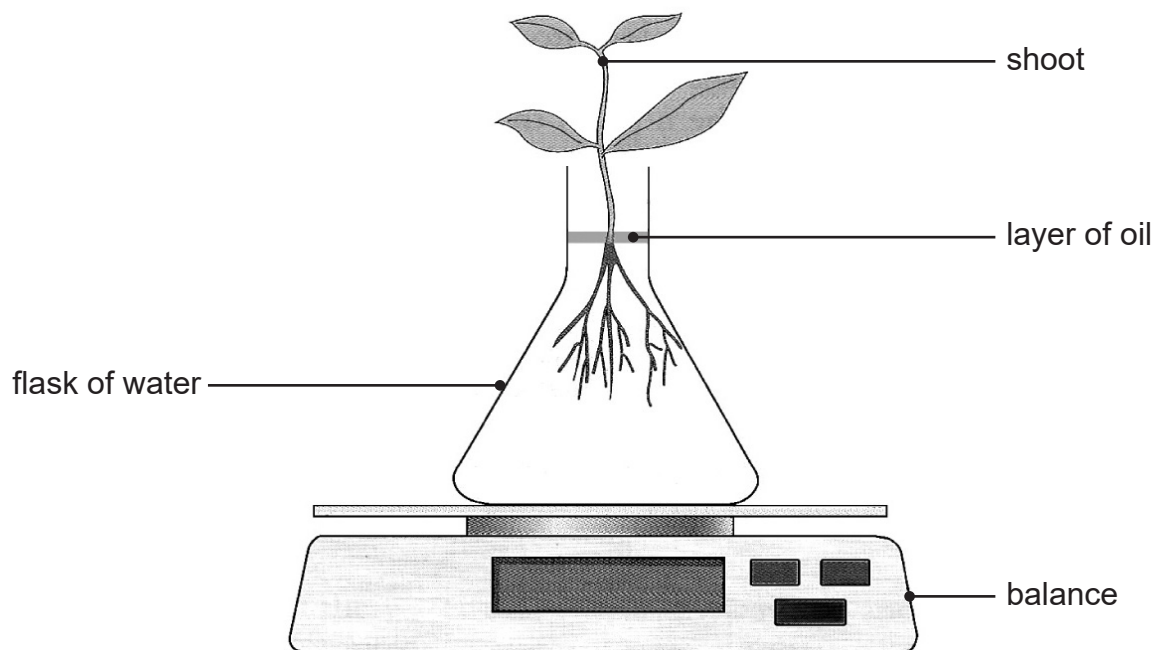
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- 3 (a) The diagram shows the apparatus used by pupils to investigate water loss from a shoot.



Source: CCEA GCSE Biology 3rd edition by D. Boyd and J. Napier (9781471892158) 2017 © Hodder and Stoughton Educational Limited. "Reproduced with permission of the Licensor through PLSclear."

Look at the diagram.

- (i) Name this apparatus.

[1]

- (ii) Explain why the pupils added a layer of oil to the top of the water in the flask.

[1]



(b) The pupils then used this apparatus to investigate the effect of wind on water loss from the shoot.

(i) Suggest how they created windy conditions in the laboratory.

[1]

The table shows the results obtained by the pupils.

Time / days	Loss in mass / g	
	No wind	Windy conditions
0	0	0
1	2	8
2	4	16
3	6	24
4	8	32
5	10	40
6	12	48

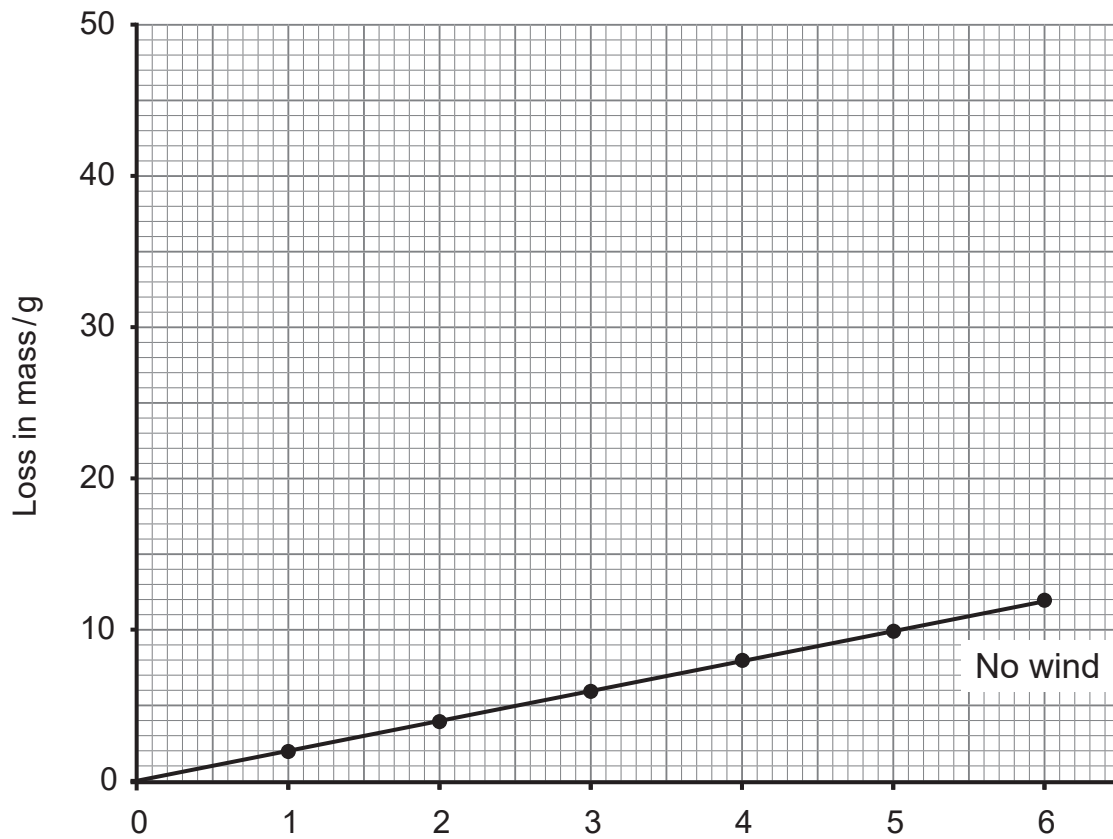
The pupils drew a line graph of their results.

(ii) Complete the graph opposite by

- labelling the x-axis, including units.
- plotting the points accurately for windy conditions.
- using a ruler to join the points with straight lines.

[4]





Both shoots lost mass over the six days.

(iii) Explain what caused this loss in mass.

[3]

[Turn over



(iv) Describe the effect of wind on the loss of mass from the shoots by comparing the two sets of results after six days.

Use **evidence** from the graph to support your answer.

[2]

(v) Suggest **two other** environmental factors affecting water loss from a shoot which could be investigated using this apparatus.

Describe how each factor could be changed.

Factor 1 _____

How it could be changed _____

[2]

Factor 2 _____

How it could be changed _____

[2]





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(Questions continue overleaf)

[Turn over



4 (a) During decomposition, microorganisms use enzymes to break down leaf litter (dead leaves).

(i) Name **two** types of microorganism which cause decomposition of leaf litter.

_____ and _____ [2]

(ii) These microorganisms secrete enzymes on to the leaf litter to break it down.

Name this type of digestion.

_____ [1]

(iii) Name the organic material which is formed in the soil when leaf litter is decomposed.

_____ [1]

(b) Students carried out an investigation to show the effect of temperature on the rate of decomposition of leaf litter.

The students recorded the percentage decomposition of leaf litter at three different temperatures over 15 days.

Their results are shown in the table.

Temperature / °C	Percentage decomposition of leaf litter			
	0 days	5 days	10 days	15 days
10	0	5	5	7
15	0	7	10	14
20	0	15	22	30



Look at the table.

- (i) Between which days and at which temperature was there **no change** in the rate of decomposition of leaf litter?

Between days _____ and _____

Temperature _____ °C [2]

The maximum rate of decomposition of leaf litter occurred at 20°C.

- (ii) Calculate the rate of decomposition of leaf litter at this temperature over the 15 days.

Show your working.

_____ percentage per day [2]

- (iii) Use your understanding of enzyme action to suggest why the rate of decomposition of leaf litter was higher at 20°C than at 15°C.

[2]

[Turn over

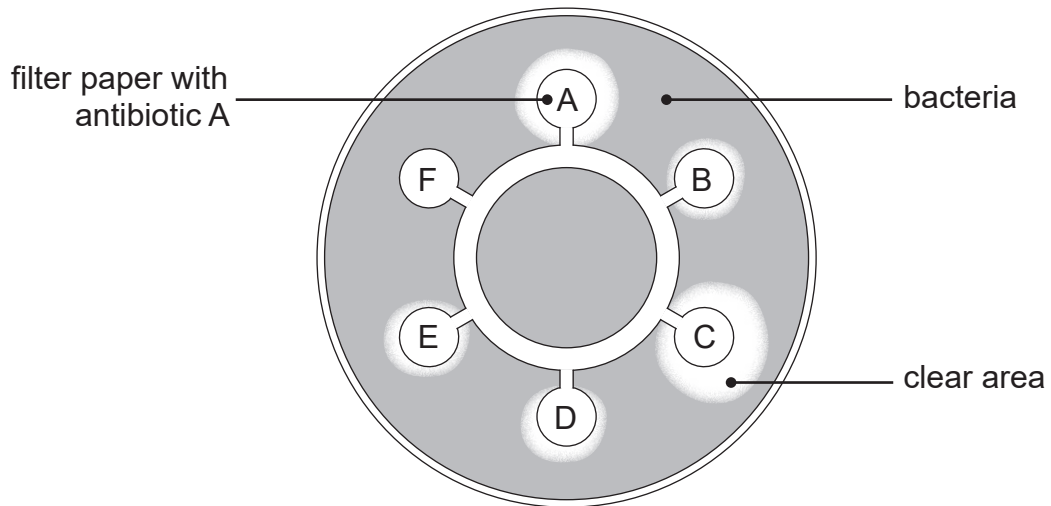


The student used this agar plate to test the effect of different antibiotics on the growth of this type of bacteria.

He placed a ring of filter paper with six different antibiotics on to the agar.

He covered the agar plate with a lid and incubated it for 48 hours.

The diagram shows the agar plate after incubation.



Look at the diagram.

(b) Use evidence from the diagram to suggest which antibiotic is most effective against this type of bacteria.

Explain your answer.

Antibiotic _____

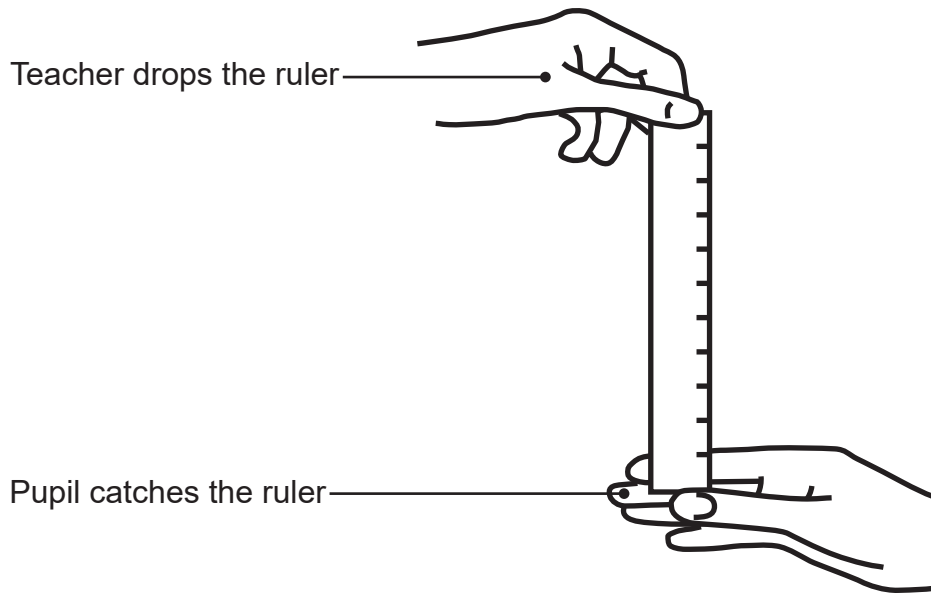
Explanation _____

_____ [3]

[Turn over



- 6 The diagram shows an experiment carried out to measure the reaction speeds of four pupils.



Source: Principal Examiner

The teacher held a ruler above a pupil's hand.

When the teacher dropped the ruler, the pupil caught it.

The experiment was carried out three times for each of the four pupils.

The **average** distance travelled by the ruler was calculated for each pupil.

(a) Suggest why.

[1]



The table shows the results.

Pupil	Distance travelled by the ruler/mm			
	Test 1	Test 2	Test 3	Average
A	240	215	190	215
B	195	120	90	135
C	175	110	300	195
D	130	100	85	105

Look at the table.

(b) Which pupil reacted quickest?

[1]

(c) The pupils concluded that their reactions improved with practice.

(i) Use data for pupil **B** to explain how they reached this conclusion.

[2]

One pupil's results **did not** support this conclusion.

(ii) Identify this pupil and explain your choice.

Pupil _____

Explanation _____

[2]

[Turn over



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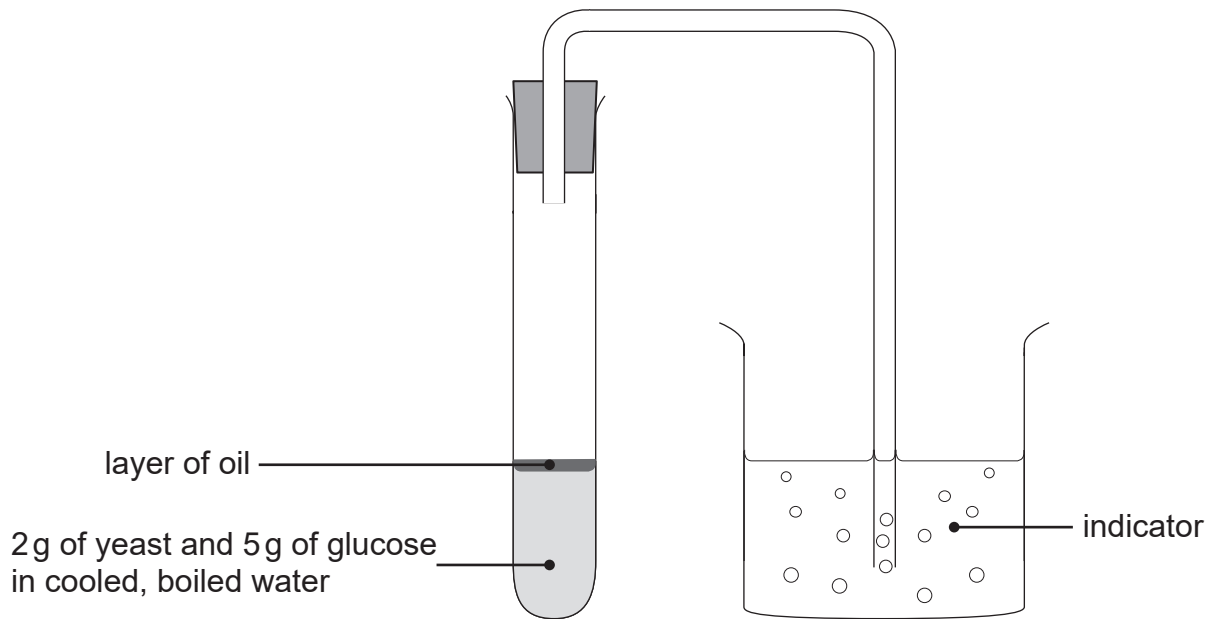


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- 7 A student carried out an experiment to investigate the effect of changing the concentration of glucose on the rate of respiration in yeast.

The diagram shows the experiment she set up.



Source: Principal Examiner

- (a) Suggest why the water was boiled and then cooled before the yeast and glucose were added.

boiled _____

cooled _____

_____ [2]

Look at the diagram.

- (b) Name the type of respiration carried out by the yeast.

_____ [1]

[Turn over



- (c) The student then counted the number of bubbles of gas produced by the yeast in 15 minutes and used this to calculate the number per minute.

She repeated the experiment by using boiling tubes containing different masses of glucose.

The table shows her results.

Boiling tube	Mass of glucose /g	Number of bubbles produced per minute
1	5	4
2	10	12
3	15	18
4	20	22
5	25	22

- (i) Name the gas produced by the yeast.

[1]

- (ii) Name an indicator which could be used to identify this gas.

Describe the colour change which would be observed in the indicator after 15 minutes.

Indicator _____

From _____ to _____ [3]



(d) Give **three** ways the contents of each boiling tube changed during the 15 minutes.

1. _____

2. _____

3. _____

_____ [3]

(e) Give evidence from the table which suggests there was a maximum rate at which the yeast carried out respiration.

_____ [2]

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Question Number	Marks
1	
2	
3	
4	
5	
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7	

Total Marks	
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Examiner Number

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