

GCSE Biology A (Gateway)

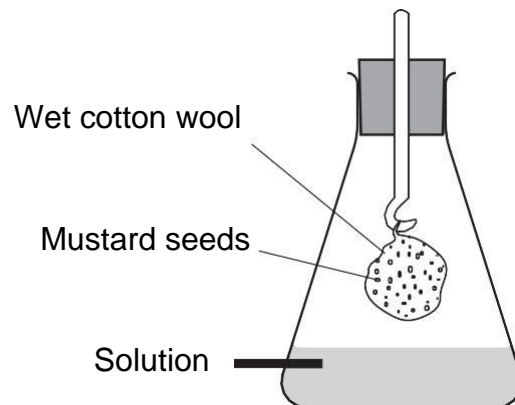
J247/02 B4-B6 and B7 Foundation (Foundation Tier)

Question Set 12

1

A student investigates the effect of acid rain on seed growth.

- She soaks cotton wool in a solution with a pH value of 7.0.
- She puts 20 mustard seeds onto the cotton wool and places it inside a flask.
- She adds the same solution to the flask.
- She then repeats this four times using solutions with different pH values. One of the flasks is shown in the diagram.



After 8 days she counts how many of the seeds are growing.
The table shows her results.

pH of solution	Number of the 20 seeds that are growing after 8 days
7.0	17
6.5	18
6.0	16
5.5	6
5.0	2

The student used 20 seeds in each flask.

- (a) Write down **one** other factor that the student should have kept the same in this investigation.

Type of seeds

[1]

- (b) Describe what this investigation shows about the effect of acid rain on seed growth. [2]

Acid rain will lower the number of seeds growing but it only affects seeds when pH less than 6.

- (c) One way to compare the growth of seeds is to use a germination index (GI).

Use the formula: $GI = \frac{\text{mean root length} \times \text{number of seeds that are growing}}{\text{number of days}}$

- (i) For the seeds at pH 6.0, the mean root length was 5

mm. Calculate the GI for these seeds.

Answer = 10

$$\frac{5 \times 16^2}{8} = 10$$

[2]

- (ii) Look at the equation for GI.

This is a better way of measuring the effect of acid rain on seed growth than just counting the number of seeds growing.

Explain why.

Because this takes into account the mean growth rate.

[1]

Total Marks for Question Set 12: 6

OCR
Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge