

A Level Biology B

H422/03 Practical skills in biology

Question Set 2

1. (a)* Lettuce seeds require a minimum day length to stimulate germination. Studies have shown that treatment with gibberellins can stimulate germination without the need for exposure to light.

Gibberellic acid is a type of gibberellin.

A gardener wishes to extend the growing season for lettuces and wants to find out the minimum concentration of gibberellic acid to use to achieve germination.

Outline a practical method to determine the minimum concentration of gibberellic acid required to stimulate germination of lettuce seeds.

Your method should be based on the assumption that you are provided with the following:

- school or college laboratory resources
- a solution of 100 mg dm^{-3} gibberellic acid.

[9]

- (b) A student is carrying out an experiment to determine the effect of a gibberellin, GA_1 , on the length of radicles (embryonic roots) of germinating pea seeds.

Fig. 2 is a photograph of the germinating pea seeds.



Fig. 2

Peas 1, 4 and 8 were placed in a 150 mg dm⁻³ solution of GA₁

Peas 2, 5 and 9 were placed in a 100 mg dm⁻³ solution of GA₁

Peas 3, 6 and 7 were placed in a 50 mg dm⁻³ solution of GA₁

All the seeds were soaked on the same day and have been growing for 5 days. The seeds have been soaked in different concentrations of GA₁ as labelled in Fig. 2.

Using a ruler, measure the radicles in Fig. 2.

In the space below construct an appropriate table and record:

- the raw data to the most appropriate level of precision for this apparatus
- the mean values.

[4]

Total Marks for Question Set 2: 13

Suggested table formats:

Concentration of GA ₁ (mg dm ⁻³)	Length of radicle (mm)	Mean length of radicle (mm)	Concentration of GA ₁ (mg dm ⁻³)	Length of radicle (mm)			
				1	2	3	Mean
50			150				
100			100				
150			50				

Acceptable ranges of values for radicles:

Use data set according to method/end points used by candidate

Concentration of GA ₁ (mg dm ⁻³)	Radicle	Length range (mm) assuming candidate has measured to the edge of the seed <i>see picture 1</i>	Length range (mm) assuming candidate has measured to the visible emergent point <i>see picture 2</i>
150	1	29-30	35-36
	4	26-28	26-28
	8	25-26	27-30
100	2	16	19-21
	5	21-22	23-25
	9	19-20	22-24
50	3	9-10	10-12
	6	11	17-21
	7	18-19	22-23



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