

Required Practical Plant Growth

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Describe how to set up an investigation into the effect of light direction on seedlings. (4 marks)

Step 1 · Seeds

Place 10 cress seeds evenly on damp cotton wool in each of three Petri dishes.

Step 2 · Conditions

Put one dish in all-round light, one in a box with a slit letting light in from one side, and one in a dark box.

Step 3 · Controls

Keep temperature and water the same; use the same type and number of seeds.

Step 4 · Measure

After 5 days measure each seedling's height with a ruler (and the angle of bending) and calculate means.

Answer: Three light conditions, controls kept constant, measure height/angle

Check: Use enough seeds to identify anomalies and calculate a reliable mean.

2. Now try one with the steps

Explain why seedlings grown in the dark are taller than those in all-round light. (2 marks)

Step 1 · Observation

Step 2 · Explanation

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. State the independent variable in a light-direction investigation. [1]

2. Give two control variables. [2]

3. Suggest why 10 seeds are used in each dish rather than 1. [1]

4. Predict which way seedlings grow when lit from one side. [1]
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5. Name the measuring instrument used for seedling height. [1]
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6. Heights were 22, 26, 25, 24 and 28 mm. Calculate the mean. [1]
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7. Seedlings grew from 0 to 30 mm in 6 days. Calculate the mean growth rate in mm/day. [1]
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8. Explain why the dark-grown seedlings are yellow rather than green. [1]
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9. Suggest why a protractor might be used. [1]
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10. Mean height was 36 mm in the dark and 25 mm in light. Calculate the percentage difference compared with light. [2]
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11. Explain why seedlings lit from one side bend towards the light. [3]
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12. Explain the purpose of a clinostat in a gravity investigation. [2]
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13. Suggest one source of error in measuring seedling height and how to reduce it. [2]
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14. Suggest why the seeds must not be allowed to dry out. [2]
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4. Before you hand it in

Measuring only one seedling per condition

Measure all seedlings and calculate a mean; ignore seeds that did not germinate and say so.

Watering dishes by different amounts

Add the same volume of water to each dish each day, using a pipette or measuring cylinder.

"The dark seedlings are healthiest because they are tallest."

Dark-grown seedlings are tall but thin and yellow; they would die without light.