

Required Practical Osmosis

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

Name _____ Class _____ Date _____

1. Worked example

Identify the independent, dependent and two control variables in this practical. (4 marks)

Step 1 · Independent (what you change)

Concentration of the sucrose solution.

Step 2 · Dependent (what you measure)

Change in mass of the potato cylinder (as a percentage).

Step 3 · Control variables

Any two: volume of solution; time in solution; temperature; potato variety; length or diameter of the cylinders; blotting method.

Answer: IV: concentration; DV: % change in mass; controls: e.g. volume and time

Check: Control variables are things kept the same so the test is fair.

2. Now try one with the steps

Explain why each cylinder is gently blotted with paper towel before weighing. (2 marks)

Step 1 · Problem

Step 2 · Effect

Answer:

3. Practice

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

1. State the independent variable in the osmosis practical. [1]

2. Name the piece of equipment used to cut potato cylinders of the same diameter. [1]

3. Give two control variables in this investigation. [2]

4. Describe what happens to a potato cylinder in distilled water and explain why. [2]
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5. A cylinder goes from 2.00 g to 2.30 g. Calculate the percentage change in mass. [2]
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6. A cylinder goes from 3.20 g to 2.88 g. Calculate the percentage change in mass. [2]
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7. Explain why percentage change in mass is used instead of change in mass. [1]
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8. Suggest why three cylinders are used at each concentration. [2]
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9. Three repeats at 0.6 mol/dm³ gave -7.3%, -6.9% and -11.8%. Identify the anomaly and calculate the mean of the other two. [2]
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10. Explain why the cylinders are left for the same length of time. [1]
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11. Suggest one source of error in this practical and how to reduce it. [2]
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12. Explain what the point where the line crosses 0% change on the graph tells you. [2]
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13. At 0.2 mol/dm³ the change is +6.0% and at 0.4 mol/dm³ it is -2.0%. Estimate the concentration of the cell sap by interpolation, in mol/dm³. [2]
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14. A student uses a balance that reads to 0.1 g. Explain why a balance reading to 0.01 g is better. [2]
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4. Before you hand it in

Plotting change in mass in grams on the y-axis

Plot PERCENTAGE change in mass so results are comparable.

Leaving out the negative sign for mass lost

Mass lost gives a negative percentage; your graph should cross the x-axis.

"The sugar went into the potato."

Sucrose molecules are too large to cross the membrane quickly; it is water that moves.

Including an obvious anomaly in the mean

Identify results that do not fit the pattern, check them, and leave them out of the mean (say so in your write-up).