



Pearson

AO 3 samples with marks

Question 4b

Sample A scores 2

mp 1 and mp 3

(b) Describe how this apparatus could be modified to measure the rate of osmosis at different temperatures.

(3)

Use multiple water beakers and place each one in a different water bath, at different temperatures (5°C apart). Place the glass tube into the water beaker as before and record the time it takes for the concentration gradient to balance, using a stop watch.

Sample B scores 1

mp 1

^{tube, as there is more solution}
(b) Describe how this apparatus could be modified to measure the rate of osmosis at different temperatures.

(3)

The apparatus could be modified by putting the visking tube into a water bath at different temperatures, increasing it by 10°C each time. The ~~time~~ time should be measured for how long it takes for the level of solution to rise to a certain point, the higher the temperature the faster the level rises.



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Sample C scores 3

mp 1 , mp 2 and mp 3

(b) Describe how this apparatus could be modified to measure the rate of osmosis at different temperatures.

(3)

The beaker could be replaced by a water bath, with a thermometer to control the temperature. The time taken for the meniscus level to rise under a range of temperatures could be recorded. We could measure how long it takes for the solution to reach a certain height, which can be measured using a ruler. We would also need a stop watch to record the time.

(Total for Question 4 = 6 marks)



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Sample D scores 3

mp 1, mp 3 and mp 2.

(b) Describe how this apparatus could be modified to measure the rate of osmosis at different temperatures.

(3)

Use a water bath to heat the water at different temperatures (Water temperature is independent variable), then at different water temperatures measure how long it takes (using a stopwatch) for the sucrose solution to rise to a desired point (use a ruler to measure the change in height), then repeat at different temperatures and make sure to keep same concentration and volume of sucrose solution in the tube.

(Total for Question 4 = 6 marks)



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Activity 8 Question 10c

Sample A scores 3 marking points C, O and R.

(c) Plant growth substances stimulate root growth from a cut stem.

Describe an investigation to find the best concentration of plant growth substance to stimulate root growth.

You should include experimental details in your answer and write in full sentences.

(6)

CORMMSS

Change the concentration of the plant's growth substance during the experiment in different tests. Use a plant e.g. daisy or some type of tree. Use the same species of plant everytime during the test to make it fair. Measure the amount grown by the plant in the same time period each in each test. Compare the results and measure the difference. Repeat and take average of experiment. The concentration that has the most root growth is the best one.



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Sample B scores 6 marking points O C S1 S2 M2 and R.

(c) Plant growth substances stimulate root growth from a cut stem.

Describe an investigation to find the best concentration of plant growth substance to stimulate root growth.

You should include experimental details in your answer and write in full sentences.

(6)

~~Place 4~~ ⁴ cut stems from the same plant ^{and place them in} 4 separate pots in soil. The plant species should be the control variable as well as the length of the cut stem. Then get 4 separate plant growth substances with different concentrations (for example 1%, 5%, 10% and 20%) this will be ~~the~~ ^{one} independent variable. Then use ~~the~~ ^{one} plant growth substance on ~~one of the plant cut stems~~ ^{label which one was used for which stem.} each for a different one. Then the others on plant growth substances on the other stems. Place all 4 stems in the same place with the same temperature, access to sunlight and amount of water given. These are all control variables. Then wait 30 days and see which stem has caused the longest root growth. Record your results and repeat to get accurate results and see which concentration ~~has the~~ stimulates root growth the best.

TOTAL FOR PAPER - 110 MARKS



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Sample C Scores 6 marking points O C M2 S1 S2 and R.

(c) Plant growth substances stimulate root growth from a cut stem.

Describe an investigation to find the best concentration of plant growth substance to stimulate root growth.

You should include experimental details in your answer and write in full sentences.

(6)

Take 5 different stem cuttings all from the same plant* Use 5 different concentrations of plant growth substances with the same difference in concentration between them. Then leave them to grow for a set period of time e.g. 5 days. You should keep all of the other variables the same like the same light, same ^{conc} volume of water, same temperature. Then after the period of time remove the stems from the plant growth substance and reweigh them. The heaviest plant has had the highest root growth. You should then repeat your experiment and plot your results on a graph.

* They should all be the same weight as well.

(Total for Question 10 = 11 marks)



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Sample D scores 5 C O S2 S1 and R.

(c) Plant growth substances stimulate root growth from a cut stem.

CORMS

Describe an investigation to find the best concentration of plant growth substance to stimulate root growth.

You should include experimental details in your answer and write in full sentences.

(6)

~~change the concentration of plant growth substance each time~~

Change the concentration of plant growth substance each time as the independent variable. Measure the root growth at each different concentration. Use the same species of plant, the same soil, the same temperature, the same water availability and the same age of plant. Repeat the experiment for more accurate results.