**AQA Biology**

**Required Practical 3- Osmosis**

***Aims:***

* To investigate the effect of concentration of salt or sugar solutions on the mass of plant tissue.
* To accurately measure length, mass and volume.
* To calculate percentage change in mass to explain results.

**Glossary**

**Osmosis**: The diffusion of water from a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solution across a **partially permeable membrane**.

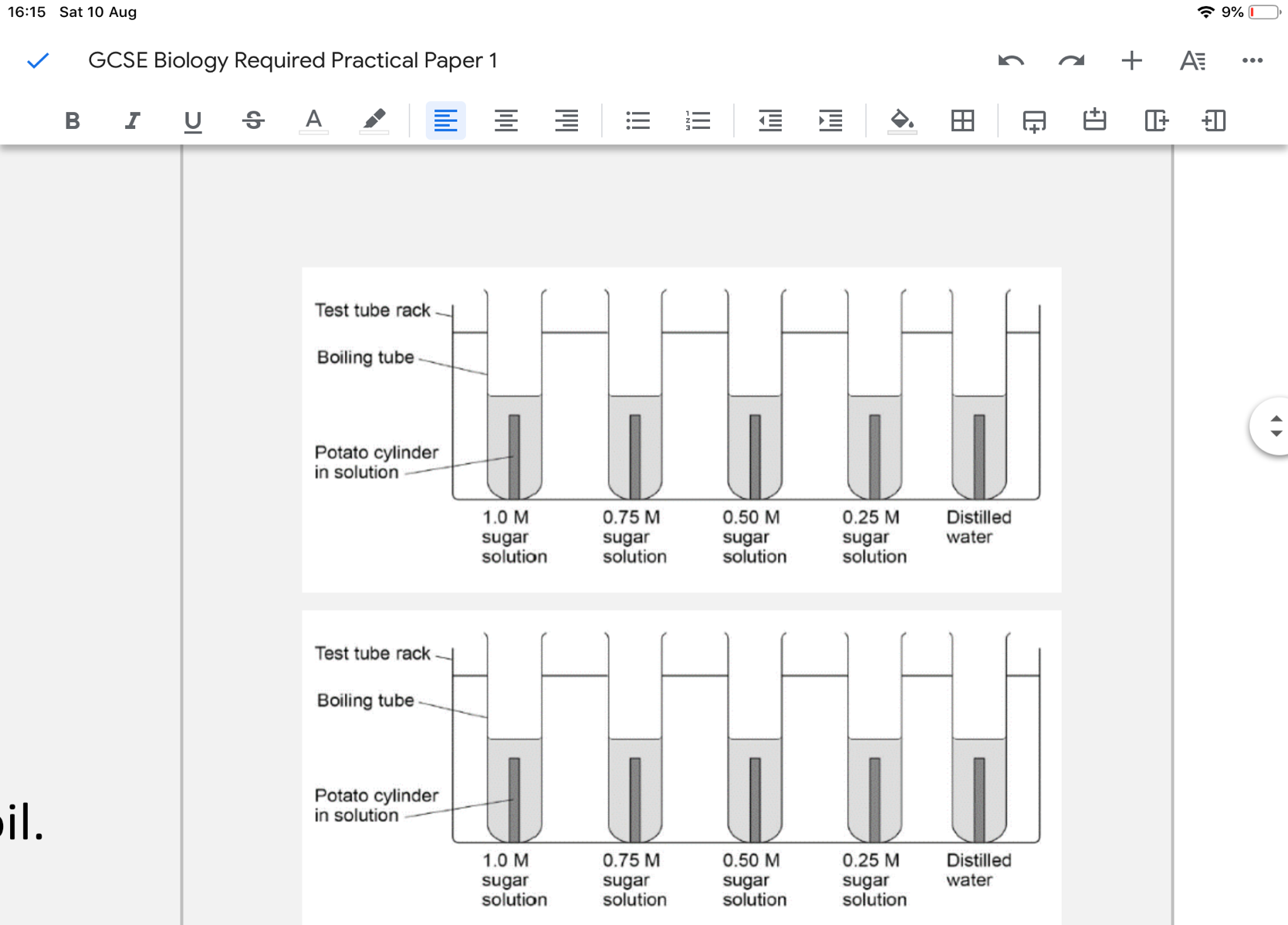
**Dilute:**

**Concentrated:**

**Hypertonic:**

**Hypotonic:**

**Isotonic:**

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**Method**

1. Use a cork borer to cut three potato cylinders of the same diameter
2. Trim the cylinders so that they are all the same length (about 3cm)

**Make sure there is no skin on the potato as this could affect the results**

1. Dry the potato carefully by blotting it with a paper towel

**This will help to remove any liquid left on the outside of the plant tissue which would affect the results**

1. Accurately measure and record the length and mass of each potato
2. Measure 10cm3 of 1.0 M, 0.75 M, 0.5 M and 0.25 M sugar/salt solution into boiling tubes. Label each to show the concentration
3. Measure 10cm3 of distilled water into a fifth boiling tube

**This acts as a control**

1. Add 1 potato cylinder into each boiling tube and leave for an exact amount of time.
2. Remove the cylinders, carefully blotting dry with paper towel
3. Re-measure the length and mass of each cylinder

**If the cylinders have drawn in water by osmosis they’ll have increased in mass. If water has been drawn out, they’ll have decreased in mass**

1. Calculate the percentage change in mass for each cylinder.

**Calculating the percentage change means you can compare the effect of the sugar concentration on cylinders that didn’t have the same initial mass.**

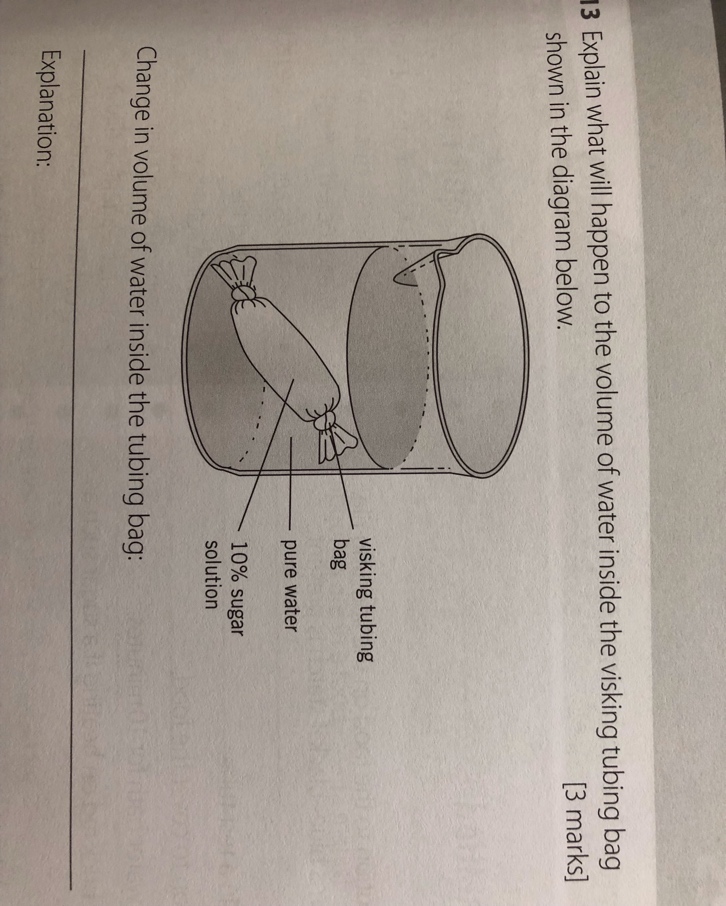
|  |  |  |  |
| --- | --- | --- | --- |
| **Concentration of solution (mol/dm3)** | **Mass before (g)** | **Mass after (g)** | **Percentage change in mass (%)** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Percentage change % = Mass before – Mass after**

**Mass before**

**Results**

1. Complete the results table with your findings.
2. Draw a graph of your results. Remember the independent variable (one we change) goes on the x axis.



**Exam Practice**

1. Explain how you would estimate the concentration at which the sugar solution and potato cells are the same. ( 2 marks)

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1. A similar experiment investigated osmosis in carrots. Explain why the carrot cores all needed to be the same length and width (3 marks).

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1. Explain what will happen to the volume of water inside the visking tubing bag shown in the diagram below (3 marks).

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