



Teacher Josephine - Biology Guru at Science MasterClass

During the pandemic year, 2020, Teacher Josephine wanted to encourage her students to strive on and do their best at O levels, so she took the GCE O LEVEL BIOLOGY PAPER too!

Though it was really a breeze for her, she was overwhelmed by emotions because she finally realized how tough it can be, for students to be taking practical examination in a non-air conditioned room, with the Bunsen burners lilted and beads of perspiration covering every candidate's eyes. Wearing a mask and sitting for examination is really not easy. Kudos to our batch of PSLE 2020 and GCE O LEVEL 2020!!!

Here's Teacher Jo Practical 2020 answers:

GCE O LEVEL BIOLOGY 6093 Practical Paper 3

Question 1

Observations

In test tube 1, Benedict's solution took 27 seconds to change from blue to orange-red precipitate.

In test tube 2, Benedict's solution remains blue.



Table to be drawn:

Test tubes	Time taken for the first sight of colour change/s	Concentration of glucose/ g/dm ³
A	32	0.60
B	21	1.50
C	57	0.25
D	>120	0.00
E	36	0.70

Possible source of errors:

1. The use of syringe. A 10cm³ of syringe is use to collect 2cm³ of Benedict's solution. This will affect the accuracy of the volume collected since this syringe size is inappropriate.

Improvement: Use of a 5cm³ syringe instead since this is a more appropriate size and the collection will be more accurate.

2. There is subjective judging to the first observation of a colour change at the tip of the test-tube. This leads to a poor decision in deciding the time taken for the observation. The presence of the large amount of bubbles obstruct viewing of the colour change.

Improvement: Use an electronic water bath so that the colour change can be view from the top of the test tube with better visibility, without the large amount of bubbles formed.

3. There is a time lapse between placing the test-tube in the boiling water bath as well as starting the stopwatch, this leads to a shorter period of time, than actual time recorded. This would in turn, affect the qualitative results in determining the glucose concentration in test tube A – E.

Improvement: Coordinate both actions of placing the test-tube and the start of the stopwatch at the same time by using both left and right hands.



Topic: Excretion

Conclusion of results:

Test-tubes A, B, C and E shows individuals who are likely to be unhealthy and diabetic because there are traces of glucose found in their urine samples. This shows that not all the glucose have been reabsorbed fast enough at the proximal convoluted tubule due to the higher than norm blood glucose concentration.

In a healthy individual, glucose molecules are reabsorbed completely at the proximal convoluted tube of the kidney nephron. Hence, patient which urine sample D collected from is likely to be healthy since there is no glucose molecules present in the urine.

Planning question:

To investigate the effect of varying temperature of glucose solution on the diffusion rate of glucose, prepare 5 setups with varying temperature of 10°C, 20°C, 30°C, 40°C and 50°C of deionised water. Use a thermometer to measure the temperature of the deionised water at the beginning of the experiment to ensure the temperature is at 10°C.

Variables:

Dependent variable:

The glucose concentration present in the deionised water.

Independent variable:

The varying temperature of the deionised water

Fixed variable:

Volume of deionised water

Volume glucose solution in the visking tubing

Concentration of glucose solution in the visking tubing



Procedure:

Place 10cm³ of 1.5g/dm³ of glucose in the visking tubing. Wiped the exterior of the Visking tubing in case of spillage. Place the visking tubing in to the boiling tube containing 10cm³ of 10degree deionised water.

Start the stopwatch. After 5 minutes, collect 3cm³ of deionised water to conduct a Benedict's test.

Record the time taken for the first sight of colour change. Use the graph on Page 4 to determine the glucose concentration in the deionised water.

Repeat the experiment for the **rest of the temperatures**. Record the result in the table as follow.

Temperature of deionised water/ °C	Time taken for the first sight of colour change/ s	Glucose concentration/g/dm ³
10		
20		
30		
40		
50		

If the glucose concentration is higher when the temperature is higher, this shows that higher temperature result in higher rate of diffusion of glucose. Repeat the experiment several times to ensure reliability of results.



Topic: Reproduction in Plants

Differences between the insect and wind pollinated flower.

Hibiscus Pollen grain	Pinus Pollen grain
<p>The hibiscus pollen grains are rough with spikes on the surfaces so that the pollen grains can adhere to the abdomens of the insects as they brush against the anther.</p> <p>The pollen grains can stick to the sticky stigma since the surfaces are rough, increasing the chance of pollination</p>	<p>The pinus pollen grains smooth on the surface for easy dispersal by wind</p> <p>The pinus pollen grains are with grooves to that it can be attached to the feathery stigma, increasing the chance of pollination.</p>
<p>The hibiscus pollen grains are larger in size – 0.11mm, better adherence to stigma.</p>	<p>The pinus pollen grains are smaller in size – 0.05mm, for easy dispersal by wind.</p>