

Centre Number						Candidate Number				
Surname										
Other Names										
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For Examiner's Use Total Task 1



General Certificate of Education
Advanced Level Examination
June 2013

Human Biology

HBI6X/PM1

Unit 6X A2 Externally Marked Practical Assignment

Task Sheet 1

To be completed before Task Sheet 2

For submission by 15 May 2013

For this paper you must have:

- a ruler with millimetre measurements
- a calculator.

Investigating the effect of an antiseptic solution on the rate of respiration in yeast

Introduction

Yeast are microorganisms. Some species of yeast live on human skin. Many skin cleansing products contain antiseptics that are claimed to reduce the populations of microorganisms on skin. You will investigate the effect of an antiseptic on the rate of respiration in yeast. You will measure the rate of respiration by measuring the rate of carbon dioxide production by a yeast suspension.

Task 1

In this task, you will familiarise yourself with the technique involved and record preliminary results. You will use this information in Task 2.

Materials:

You are provided with:

- yeast suspended in a solution of glucose
- antiseptic solution
- distilled water
- 2 large tubes
- 2 small tubes
- plastic pipettes
- glass rod
- thermometer
- boiling-tube rack
- timer
- marker pen
- 250 cm³ beaker to use as a water bath
- access to hot and cold water
- a ruler with millimetre measurements.

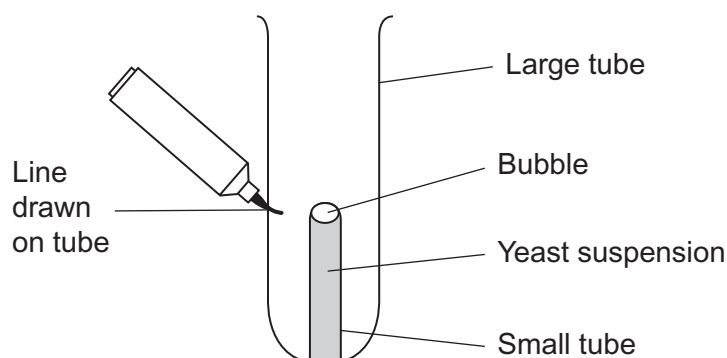
You may ask for any other apparatus you require.

Outline method

Read these instructions carefully before you start your investigation.

Practise setting up the apparatus by following steps 1 to 4.

1. Completely fill a small tube with water; hold this in one hand.
2. With your other hand turn a large tube upside down.
3. Push the small tube up inside the large tube until it reaches the end. You may use your finger or the glass rod to do this.
4. Keeping your finger or the glass rod in place, quickly turn the large tube the right way up. Most of the water should stay in the small tube as shown in the diagram.



5. Practise until you feel confident in your technique then move on to step 6.
6. Set up a water bath at 35 °C. Maintain the water at 35 °C throughout the experiment by adding warm water to the beaker if the temperature drops.
7. Label the large tubes **A** and **B**.
8. Add 10 drops of antiseptic to **one** of the small tubes.
9. Use a plastic pipette to fill up completely the small tube with yeast suspension.
10. Set up the apparatus as you did in your practice using this tube instead of water. Your equipment should be set up as you did in step 4.
11. Draw a line on tube **A** to show the level of the bottom of the bubble in the smaller tube.
12. Put tube **A** into the water bath and leave for 10 minutes.
13. Take tube **A** out of the water bath and draw a line on tube **A** to show the new level of the bottom of the bubble.
14. Record the distance between the lines on tube **A**.
15. Add 10 drops of distilled water to the second small tube.
16. Repeat steps 9 to 14 using this tube and tube **B**.

You will need to decide for yourself:

- how many repeats to carry out.

Turn over ►

Recording your results

Record your results in a suitable table below.

Questions on Task 1

Answer **all** questions in the spaces provided.

- 1 (a)** Tube **B** was the control experiment for this investigation.
Explain how it acted as the control experiment.

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(1 mark)

- 1 (b)** You measured the gas produced in the small tubes by recording the difference in the level of liquid.
Give **two** assumptions made when using this method of measuring gas produced.

1

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2

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(2 marks)

- 2** Some of the yeast suspension was displaced by the gas formed.
Suggest how this would have affected the results.

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(2 marks)

Turn over ►

- 3** The distance between the two lines on tube **A** is a measure of the rate of respiration of yeast.
Explain why.

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(2 marks)

- 4** A student carried out a similar investigation to you. She measured bubble length and recorded the pH of the contents of the small tube. She found that the pH in tube **A** became more acidic at the end of each experiment.

- 4 (a)** Suggest why the pH became more acidic.

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(2 marks)

- 4 (b)** What could the student do to prevent this pH change?

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(1 mark)

END OF TASK 1

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