

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use Total Task 2



General Certificate of Education
Advanced Subsidiary Examination
June 2010

Biology

BIO3X/PM2

**Unit 3X AS Externally Marked Practical Assignment
Task Sheet 2**

To be completed before the EMPA Written Test.

For submission by 15 May 2010

For this paper you must have:

- a ruler with millimetre measurements
- a calculator.

Task 2

In this part of the investigation you will examine the effect of pH on the rate of breakdown of lactose by lactase at 30 °C.

Materials

You are provided with the following

- solution of lactase
- fresh milk
- buffer solutions at pH values of 5.0, 6.0, 6.5, 7.0 and 8.0
- glucose test strips
- access to a glucose test strip colour chart
- access to a water bath at 30°C
- thermometer
- a stop watch
- boiling tubes
- rack for boiling tubes
- syringes or pipettes to measure 2 cm³ and 10 cm³
- marker pen or labels

You may ask your teacher for any other apparatus you need.

Outline method

Read these instructions carefully before you start your investigation.

Glucose test strips change colour over a period of time. To get an accurate reading, the colour should be recorded **exactly 10 seconds** after the strip has been removed from the liquid.

1. Put 10 cm³ of milk and 10 cm³ pH 7.0 buffer into one boiling tube.
2. Put 2 cm³ lactase into a second tube.
3. Put both tubes in a water bath and leave them for 3 minutes.
4. Add the lactase to the milk and buffer mixture.
5. Shake the mixture and return the tube to the water bath.
6. Start the stop watch and immediately dip a glucose test strip into the mixture and remove.
7. Wait **exactly 10 seconds** then compare the colour of the glucose test strip with the colour chart.
8. Dip a new glucose test strip into the mixture every minute and record the time when glucose first appears.
9. Repeat steps 1 to 8 with buffers at pH 5.0, 6.0, 6.5 and 8.0 instead of buffer at pH 7.0.
10. If there is no colour change after 10 minutes, you should stop testing.

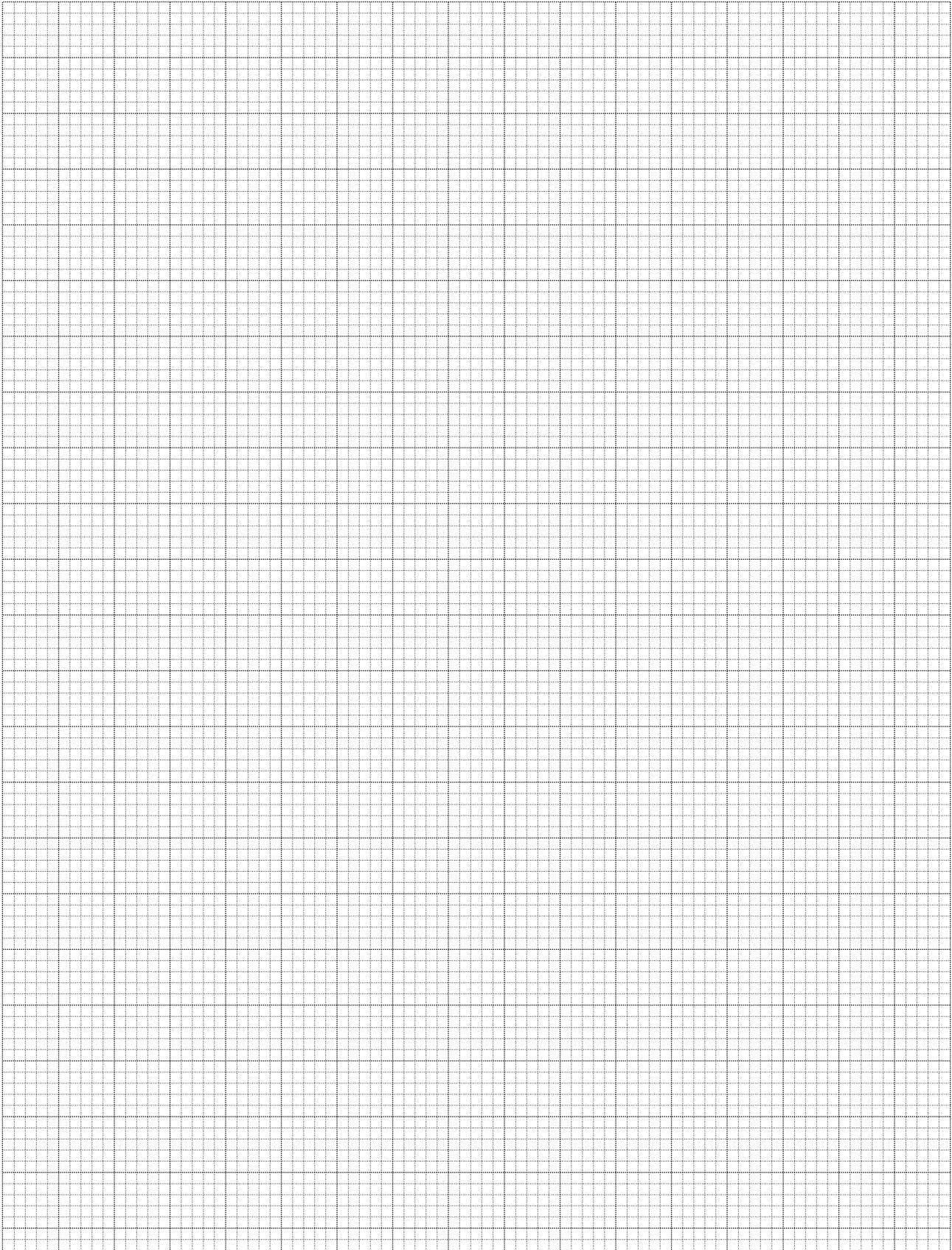
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Presenting data

6 Record the results of your investigation in an appropriate table in the space below. (3 marks)

You will be awarded up to 1 mark for the quality of your practical work. (1 mark)

- 7 Use the graph paper to plot an appropriate graph of the data you collected in Task 2.
(6 marks)



END OF TASK 2

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