

Centre Number						Candidate Number				
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For Examiner's Use Total Task 2



General Certificate of Education
Advanced Subsidiary Examination
June 2010

Human Biology

HB13X/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.

Investigating the cell cycle and the time spent in different stages of mitosis

Introduction

In eukaryotic organisms, such as humans and plants, cells divide by mitosis. Between the visible events of mitosis, a cell is in interphase. Interphase is the stage in the cell cycle when a cell is not dividing.

The stages of mitosis take different times to complete. You can estimate how long each stage takes by using a microscope to count the number of cells in each stage. The larger the number of cells you see at each stage, the longer the stage must take to complete.

In Task 2, you will use prepared slides of plant root tips. For this investigation, you may assume that one complete cell cycle takes 720 minutes.

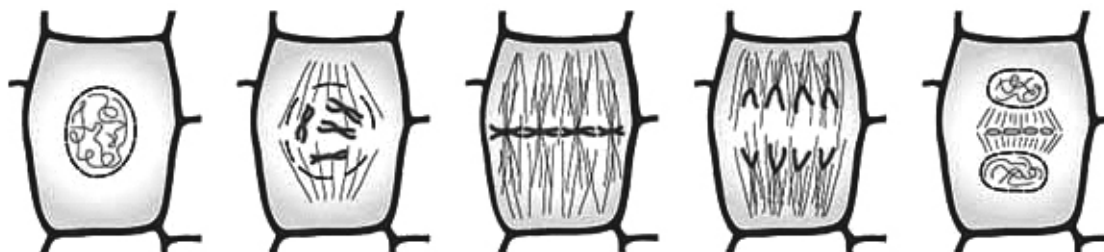
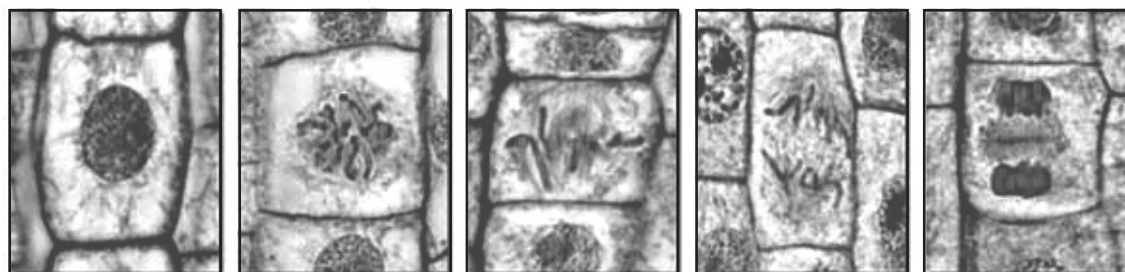
Task 2

Materials

You are provided with

- a microscope
- a prepared slide of a longitudinal section through a root tip
- photographs and diagrams to allow you to identify the stages of the cell cycle
(**Figure 1**)

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

Figure 1**The stages in the cell cycle in cells from a root tip****Diagrams****Photographs**

interphase

prophase

metaphase

anaphase

telophase

Method

Read these instructions carefully before you start your investigation.

1. Place the slide of the root tip on the stage of your microscope.
2. Count and record the number of cells in interphase and in each stage of mitosis.

You will need to decide for yourself

- how to locate the region of dividing cells
- the stage of mitosis or cell cycle that a cell is showing
- how many cells to count.

To help you process your data, the time required for each stage of the cell cycle can be calculated using the formula:

$$\text{Number of minutes to complete a stage} = \frac{\text{number of cells in stage}}{\text{total number of cells counted}} \times 720$$

Turn over ►

Presenting data

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

The time required for each stage of the cell cycle can be calculated using the formula:

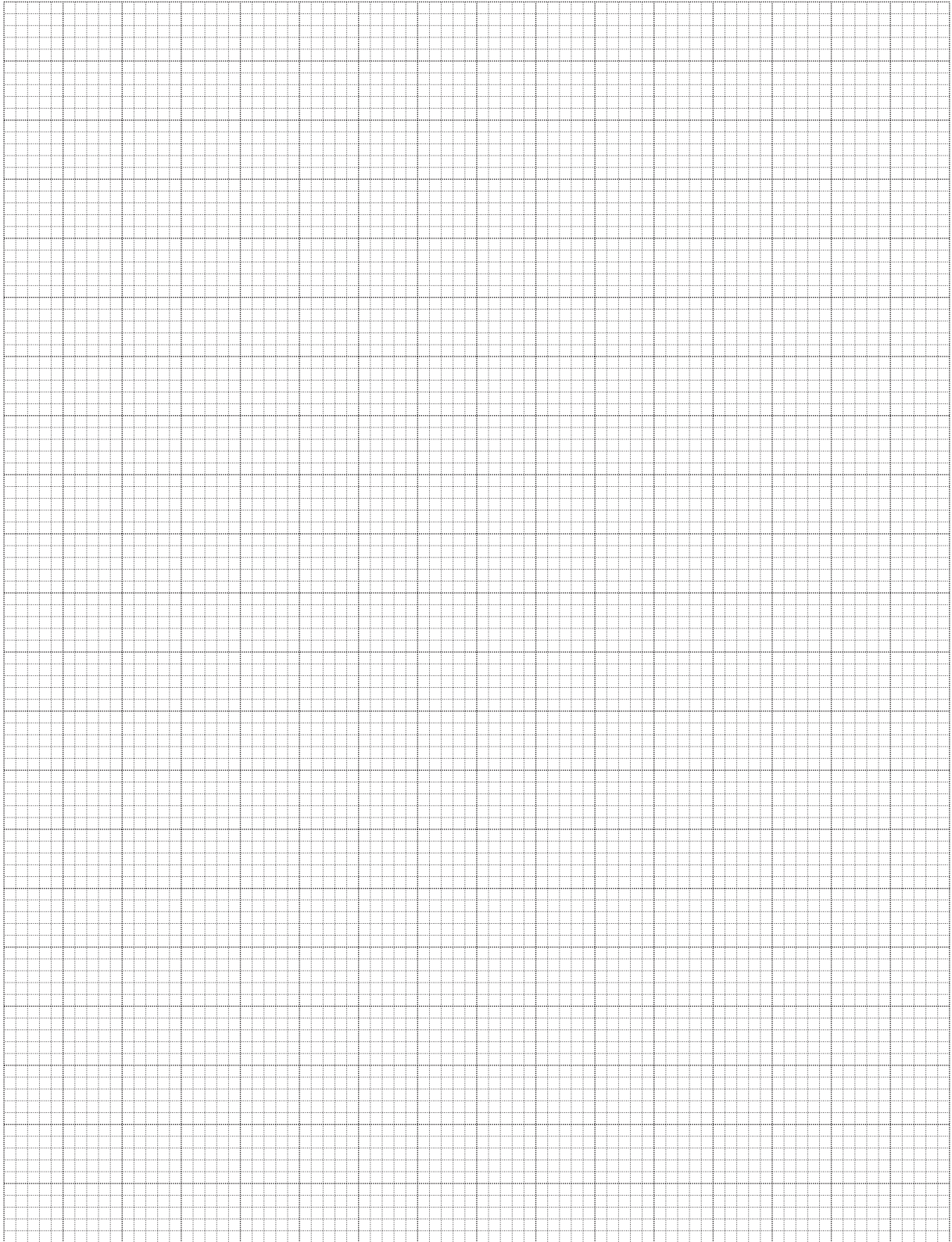
$$\text{Number of minutes to complete a stage} = \frac{\text{number of cells in stage}}{\text{total number of cells counted}} \times 720$$

Use the space below to do any calculations.

5

Use the graph paper to plot an appropriate graph of your processed data.

(7 marks)



END OF TASK 2

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