GCSE and IGCSE Biology: Cells and Microscopy Worksheet

Year 10-11 · GCSE (AQA 4.1.1) and Cambridge IGCSE 0610 topic 2 · Exam-style questions

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 63

Section A: Cell structure [25 marks]

1 Complete the table to show the function of each cell part and whether it is found in animal cells, plant cells and bacterial cells. **[21]**

Cell part	Function	Animal	Plant	Bacterium
Nucleus				
Cell membrane				
Cell wall				
Chloroplast				
Mitochondria				
Ribosome				
Permanent vacuole				

2 Explain the difference between a eukaryotic cell and a prokaryotic cell. **[2]**

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3 Name two structures found in a bacterial cell but not in an animal cell. **[2]**

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Section B: Specialised cells [13 marks]

4 Explain how each specialised cell is adapted to its function. **[8]**

Cell	Function	Adaptation
Sperm cell	Fertilise an egg	1 ..... 2 .....
Nerve cell	Send electrical impulses	1 ..... 2 .....
Root hair cell	Absorb water and mineral ions	1 ..... 2 .....
Xylem	Transport water and support the plant	1 ..... 2 .....

5 Describe what is meant by cell differentiation and state where it takes place in plants. **[3]**

6 Put these in order of size, smallest first: organ, cell, organism, tissue, organ system. **[2]**

Section C: Microscopy and calculations [14 marks]

7 Compare the light microscope and the electron microscope in terms of magnification, resolution and what can be seen. **[4]**

8 Use magnification = image size ÷ real size.

(a) A drawing of a plant cell is 45 mm wide. The magnification is ×300. Calculate the real width in µm. **[3]**

(b) A nucleus is 8 µm wide. It is drawn 40 mm wide. Calculate the magnification. **[3]**

(c) Write 0.000 007 m in standard form and in µm. **[2]**

(d) Complete the table: 1 mm = ... µm; 1 µm = ... nm. **[2]**

Section D: Practical skills [11 marks]

9 Describe how to prepare a slide of onion epidermis for a light microscope (required practical 1). **[4]**

10 A student cultures bacteria on an agar plate. Explain why: (a) the inoculating loop is passed through a flame; (b) the lid is taped on but not sealed fully; (c) the plate is incubated at 25 °C and not 37 °C in school. **[3]**

11 Antibiotic discs produce clear zones on the plate. One clear zone has a diameter of 12 mm. Calculate its area using area = ?r². **[2]**

12 Give one advantage and one disadvantage of using a stain on a slide. **[2]**