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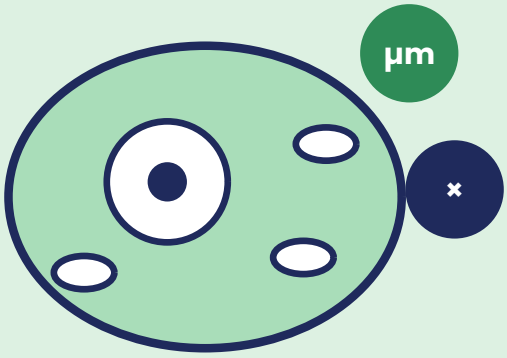
Year 10–11 • GCSE & IGCSE Biology

Cells & Microscopy



Exam-Style Worksheet

Exam-style questions on cell structure, specialised cells, microscopes, magnification and practical skills.

Cell parts | Bacteria | Specialised | Microscopes | Magnification | Practicals

KEY IDEAS IN THIS WORKSHEET **YEAR 10–11**

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Section A	Cell structure	**25 marks**
Section B	Specialised cells	**13 marks**
Section C	Microscopy and calculations	**14 marks**
Section D	Practical skills	**11 marks**

Instructions

- Answer all questions in the spaces provided.
- Show your working in calculations.
- Marks for each question are shown in [ ].
- Use the word and equation boxes to help you.

Total score

/ 63

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Cells and Microscopy Worksheet

Year 10–11 • GCSE (AQA 4.1.1) and Cambridge IGCSE 0610 topic 2 • Exam-style questions. Show your working in calculations.

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. Write Yes or No. **[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]**

.....

.....

Section B Specialised cells [13 marks]

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

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

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

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

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Section C Microscopy and calculations [14 marks]

Equation magnification = image size ÷ real size | 1 mm = 1000 µm | 1 µm = 1000 nm

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

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.....

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]**

.....

.....

real width = ... µm

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

.....

.....

magnification = × .....

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

.....

(d) Complete: 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). **[4]**

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10 A student cultures bacteria on an agar plate. Explain why:

(a) the inoculating loop is passed through a flame **[1]**

.....

(b) the lid is taped on but not sealed fully **[1]**

.....

(c) the plate is incubated at 25 °C and not 37 °C in school. **[1]**

.....

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

.....

.....

area = ... mm^2

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

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END OF WORKSHEET **Total: _____ / 63**