Year 7 Cells and Microscopes Worksheet

Year 7 · KS3 Biology · Cells, microscopes and specialised cells

Name: ..... **Class:** ..... **Date:** ..... **Score: / 62**

Section A: Cell parts and their jobs [20 marks]

nucleus | cytoplasm | cell membrane | cell wall | chloroplasts | vacuole | mitochondria

1 Use words from the box to complete each sentence. You may use a word once, more than once, or not at all.

(a) The ..... controls the cell and contains the DNA. **[1]**

(b) Most chemical reactions happen in the ..... . **[1]**

(c) The ..... controls what enters and leaves the cell. **[1]**

(d) The ..... is made of cellulose and strengthens plant cells. **[1]**

(e) Green ..... contain chlorophyll and absorb light for photosynthesis. **[1]**

(f) Energy is released from glucose in the ..... . **[1]**

2 Complete the table. Write Yes or No in each box. **[14]**

Cell part	Found in an animal cell?	Found in a plant cell?
Nucleus		
Cell membrane		
Cytoplasm		
Cell wall		
Chloroplasts		
Large permanent vacuole		
Mitochondria		

Section B: Using a microscope [16 marks]

3 Name the part of the light microscope that does each job. Choose from: eyepiece lens, objective lens, stage, light source, coarse focusing wheel. **[5]**

Job	Name of part
You look through this lens	
Holds the slide in place	
Provides light so you can see the specimen	
Moves the lenses up and down to focus quickly	
Magnifies the specimen; there are three or four of different strengths	

4 Total magnification = eyepiece lens magnification × objective lens magnification.

(a) The eyepiece lens is ×10 and the objective lens is ×40. Calculate the total magnification. **[2]**

(b) A student changes to the ×4 objective lens and keeps the ×10 eyepiece lens. Calculate the new total magnification. **[1]**

(c) Which objective lens, ×4 or ×40, will show more of the slide at once? **[1]**

5 The steps for using a microscope are listed below in the wrong order. Write the letters in the correct order. **[3]**

A Turn the fine focusing wheel until the image is sharp.
B Place the slide on the stage and clip it in place.
C Look through the eyepiece lens and use the coarse focusing wheel to focus.
D Switch on the light and turn to the lowest power objective lens.
E Change to a higher power objective lens if needed.

6 Explain why you should always start with the lowest power objective lens. **[2]**

7 Use 1 mm = 1000 µm to complete these conversions. **[2]**

(a) 0.5 mm = ... µm
(b) 2500 µm = ... mm

Section C: Plant cells, animal cells and specialised cells [15 marks]

8 Give three differences between a plant cell and an animal cell. **[3]**

9 Explain why:

(a) palisade cells in a leaf contain many chloroplasts. **[2]**

(b) plant cells have a cell wall but animal cells do not. **[2]**

10 Specialised cells have features that help them do their job. Complete the table by describing one feature of each cell. **[5]**

Cell	Job	Feature that helps it do its job
Red blood cell	Carries oxygen	
Root hair cell	Absorbs water and minerals	
Sperm cell	Swims to the egg	
Nerve cell	Carries electrical signals	
Palisade cell	Photosynthesis	

11 Cell, organ, organism, tissue and organ system are levels of organisation.

(a) Write the levels in order, starting with the smallest. **[2]**

(b) The stomach is an organ. Name the organ system it belongs to. **[1]**

Section D: Practical skills and calculations [11 marks]

12 A student makes a slide of onion skin to look at plant cells.

(a) Why does the student add iodine solution to the onion skin? **[1]**

(b) The student lowers the coverslip on to the slide at an angle using a mounted needle. Give one reason. **[1]**

(c) The student draws one cell. The drawing is 60 mm wide. The actual cell is 0.3 mm wide. Use the formula magnification = image size ÷ actual size to calculate the magnification of the drawing. **[2]**

(d) State two rules for a good scientific drawing. **[2]**

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13 Challenge: a student draws a cell with a width of 4 cm. The magnification is ×400. Calculate the actual width of the cell in µm. (1 cm = 10 mm, 1 mm = 1000 µm) **[3]**

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14 A sperm cell has many mitochondria. Explain why this helps the sperm cell. **[2]**

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