2 Specialised cells and size – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
specialised cell			
red blood cell			
oxygen			
root hair cell			
nerve cell			
impulses			
tissue			
muscle			
organ			
organ system			
digestive system			
microscope			
magnification			

Recall

Cells are the building blocks of life. Most cells are **specialised** – their shape suits one job – and they build up into larger structures.

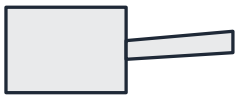
New ideas

Read these first, then do the Practice.

1 Specialised cells

A **specialised cell** has a shape that suits its job:

red blood cell
(carries oxygen)



root hair cell
(absorbs water)

nerve cell
(carries impulses)

Cell	Job	How its shape helps
red blood cell	carry **oxygen**	no nucleus, dish shape → holds more oxygen
root hair cell	absorb water	long "hair" → large surface
nerve cell	carry **impulses**	very long → reaches far

2 Levels of organisation

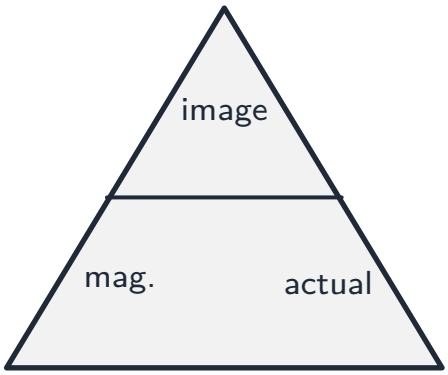
Cells are organised into bigger and bigger structures:

- a **tissue** is a group of similar cells (e.g. **muscle**);
- an **organ** is several tissues working together (e.g. the heart);
- an **organ system** is several organs together (e.g. the **digestive system**).

■ 3 Magnification

Cells are tiny, so we look at them with a **microscope** . How much bigger the image is, is the **magnification** :

$$\text{magnification} = \frac{\text{image size}}{\text{actual size}}$$



Cover the quantity you want to find. Always use the **same unit** for both sizes (1 mm = 1000 μm).

Watch out: the levels of organisation go **cell → tissue → organ → organ system → organism**, in that order. For magnification use the *same unit* for both sizes, and magnification = image ÷ actual.

Practice

Try these in order.

2.6 Why does a red blood cell have no nucleus? [1]

2.7 Put these in order from smallest to largest: organ, cell, organism, tissue, organ system. [2]

2.8 What is a *tissue*? [1]

2.9 A cell's image is 8 mm across at a magnification of ×400. Work out its actual size in mm. [2]

2.10 How many micrometres (μm) are there in 1 mm? [1]

2.11 Challenge. A cell is actually 0.05 mm wide. Under a microscope its image is 20 mm wide. Calculate the magnification. [2]