# 2 Specialised cells and size – Part 2

Name: _____ Class: _____ Date: _____

## Vocabulary 词汇

*Write each word three times.* 把每个单词抄写三遍。

| English | 中文 | Write it 3 times (English) | | |
|---|---|---|---|---|
| specialised cell | 特化细胞 | | | |
| red blood cell | 红细胞 | | | |
| oxygen | 氧气 | | | |
| root hair cell | 根毛细胞 | | | |
| nerve cell | 神经元 | | | |
| impulses | 脉冲 | | | |
| tissue | 组织 | | | |
| muscle | 肌肉 | | | |
| organ | 器官 | | | |
| organ system | 器官系统 | | | |
| digestive system | 消化系统 | | | |
| microscope | 显微镜 | | | |
| magnification | 放大倍数 | | | |



## Recall

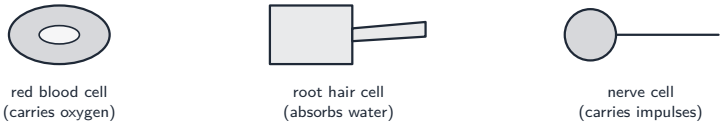
Cells are the building blocks of life. Most cells are **specialised** — their shape suits one job — and they build up into larger structures.

## New ideas

Read these first, then do the Practice.

### 1 Specialised cells

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




| Cell | Job | How its shape helps |
|---|---|---|
| **red blood cell** 红细胞 | carry **oxygen** 氧气 | no nucleus, dish shape → holds more oxygen |
| **root hair cell** 根毛细胞 | absorb water | long "hair" → large surface |
| **nerve cell** 神经元 | carry **impulses** 脉冲 | very long → reaches far |

### 2 Levels of organisation

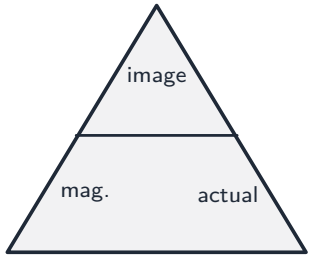
Cells are organised into bigger and bigger structures:


- a **tissue** 组织 is a group of similar cells (e.g. **muscle** 肌肉);
- an **organ** 器官 is several tissues working together (e.g. the heart);
- an **organ system** 器官系统 is several organs together (e.g. the **digestive system** 消化系统).

### 3 Magnification

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

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




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

**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 ($\mu$m) 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]