Your notes

KS3 Science: revision notes

B1.1 Cells

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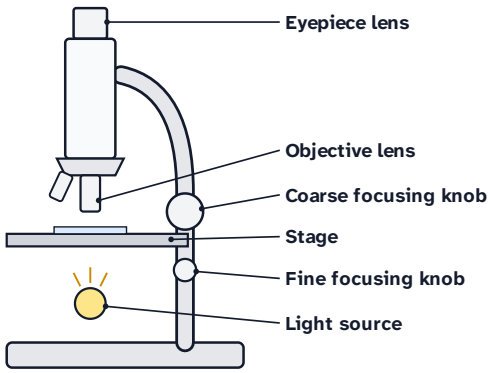
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Animal and plant cells

- All living things are made of **cells**. Some organisms are a single **cell** (unicellular, such as yeast); others are made of many **cells** (multicellular).
- Animal **cells** have a **nucleus** (controls the **cell** and contains the genetic material), a cell membrane (controls what goes in and out), cytoplasm (where most chemical reactions happen), mitochondria (where respiration releases energy) and ribosomes (where proteins are made).
- Plant **cells** have all of these, plus a **cell wall** made of cellulose (strengthens and supports the **cell**), chloroplasts (absorb light for photosynthesis) and a permanent vacuole filled with cell sap (keeps the cell firm).

Using a microscope

- Parts: eyepiece lens, objective lenses, stage, light source, coarse focus and fine focus.
- Total **magnification** = eyepiece **magnification** × objective **magnification**. A ×10 eyepiece with a ×40 objective gives ×400.
- Start with the lowest-power objective lens, focus with the coarse focus, then use the fine focus.
- Preparing a slide: put a thin layer of **cells** (such as onion skin) on a slide, add a stain (iodine for plant **cells**, methylene blue for cheek **cells**) and lower a coverslip at an angle to avoid air bubbles.



Specialised cells

- Red blood **cells** have no **nucleus** and contain haemoglobin to carry oxygen.
- Nerve **cells** are long, to carry electrical impulses around the body.
- Sperm **cells** have a tail to swim and lots of **mitochondria** to release energy.
- Root hair **cells** have a long extension that gives a large surface area to absorb water and minerals.
- Palisade **cells** in leaves are packed with **chloroplasts** for photosynthesis. Ciliated **cells** have tiny hairs that sweep mucus out of the airways.

Organisation and science skills

- **Cells** → **tissues** (groups of similar **cells**) → organs (groups of tissues) → organ systems (groups of organs) → organism.
- A hazard is something that could cause harm; a risk is the chance of harm happening. Reduce risks with precautions such as goggles and tying long hair back.
- Units: 1 cm = 10 mm, and 1 mm = 1000 micrometres (µm). **Cells** are usually measured in micrometres.
- **Magnification** = image size ÷ actual size.

Key terms

Cell	The basic building block of all living things.
Nucleus	Controls the cell and contains the genetic material.
Cell membrane	Controls what enters and leaves the cell.
Cytoplasm	Jelly-like substance where most chemical reactions happen.
Mitochondria	Where respiration releases energy.
Cell wall	Made of cellulose; strengthens and supports a plant cell.
Chloroplast	Absorbs light for photosynthesis.
Vacuole	Filled with cell sap; keeps a plant cell firm.

Your notes

Specialised cell	A cell with a special shape or features for its job.
Tissue	A group of similar cells working together.
Organ	A group of tissues working together.
Magnification	How many times bigger an image is than the real object.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which part of a cell controls its activities?
2. Which part controls what enters and leaves a cell?
3. Where does respiration happen in a cell?
4. Which three parts are found in plant cells but not animal cells?
5. What do chloroplasts do?
6. The eyepiece lens is ×10 and the objective lens is ×40. What is the total magnification?
7. Which objective lens should you use first when looking at a slide?
8. Why is iodine added to a slide of onion cells?

Answers

1. Nucleus
2. Cell membrane
3. Mitochondria
4. Cell wall, chloroplasts and permanent vacuole
5. Absorb light for photosynthesis
6. ×400
7. The lowest-power one
8. To stain the cells so their parts show up

What to do next

Practise 14 questions on this topic

Try 4 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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