Biology · Cells · Revision workbook

Cells and their structures

Name _____ Date _____

Key ideas

Cells contain structures with specialised jobs. The cell membrane regulates exchange, the nucleus holds most genetic information in typical animal and plant cells, ribosomes make proteins and mitochondria are sites of aerobic respiration. Typical plant cells also have a cellulose wall and a large vacuole. Photosynthetic plant cells have chloroplasts.

Worked examples

Why does a palisade cell contain many chloroplasts?

Chloroplasts contain pigments that absorb light. Many chloroplasts help a leaf cell capture light for photosynthesis.

An image of a cell measures 24 mm and its actual size is 60 µm. Calculate the magnification.

24 mm = 24,000 µm. Magnification = 24,000 ÷ 60 = ×400.

Practice questions

Show your reasoning. Each question is worth 2 marks.

1. Name the structure that controls exchange with a typical animal cell and state its role.

2. Name the structure that is the main site of protein synthesis in cells. Explain what it does.

3. Name two structures common in typical photosynthetic plant cells that animal cells lack.

4. Explain how the nucleus and ribosomes contribute to making cell proteins.

5. Explain why skeletal muscle cells may contain many mitochondria.

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6. A cell appears 18 mm long in an image taken at ×300. Calculate its actual length in µm.

7. Why do root hair cells generally lack chloroplasts? Give a reason tied to their surroundings.

8. A student identifies a green object as a chloroplast solely from its colour. Suggest one further piece of evidence and explain why.

9. Image A shows a 20 µm cell at ×500. Image B shows a 50 µm cell at ×160. Which image is longer? Show your calculations.

10. Predict what happens to a typical plant cell placed in dilute water. Explain how the wall affects the outcome.