

Biology

Original practice in 13 topic units, with explanations, worked examples and answer guidance. Use alongside the prescribed texts and syllabus.



13 practice units

78 tasks with answer guidance

Name / नाम: _____

Original selected-topic practice. Use alongside school lessons and the prescribed textbook. The contents define this book's scope.

CBSE course 044 · 2026–27 · Selected practice, not a complete syllabus or official examination paper.

UNIT 01 / 13 · LEARN & TRY

Cell atlas: structure supports function

Name: _____ Date: _____

Goal: Compare cell organisations and connect named structures to specific functions.

Learn

A cell is a living system of organised structures, not a bag of unrelated labels. In a typical eukaryotic cell, a membrane regulates exchanges with the environment, a nucleus contains much of the genetic material, and specialised organelles support coordinated processes. Ribosomes synthesise polypeptides; the endoplasmic reticulum and Golgi apparatus contribute to synthesis, processing and trafficking of cellular products. Mitochondria participate in aerobic respiration. Plant cells usually also have a cellulose wall, and photosynthetic cells contain chloroplasts; not every plant cell is photosynthetic. Prokaryotic cells lack a membrane-bound nucleus and the typical membrane-bound organelles of eukaryotes, but do have genetic material, a membrane and ribosomes. Diagrams are simplified models: real cell proportions, shapes and numbers of organelles vary. Use a structure–function explanation rather than a colour key, and distinguish a cell wall from a plasma membrane. Both may be present in one cell, but they have different roles.

Worked example

Explain why one plant cell diagram cannot represent every plant cell. A leaf mesophyll cell contains chloroplasts, a cellulose wall and a plasma membrane. Chloroplasts support photosynthesis; the wall helps mechanical support; the selectively permeable membrane regulates exchange. A root cell may have the wall and membrane but lack chloroplasts because it is not carrying out photosynthesis. Therefore a diagram with chloroplasts is not a universal model of every plant cell.

1. Name the cell boundary directly involved in selective transport. [1 marks]

UNIT 01 · PRACTISE · 5–6

Cell atlas: structure supports function

5. Explain how a plant cell wall and central vacuole together help a herbaceous stem remain firm. [3 marks]

6. Compare smooth and rough endoplasmic reticulum and explain one function of each. [3 marks]

Explain one answer. Choose a question to revisit after a few days.

UNIT 01 · ANSWER GUIDANCE

Cell atlas: structure supports function

1. The plasma membrane.
2. Most root cells are not exposed to light and do not perform photosynthesis; they may contain other plastids instead.
3. Both have a plasma membrane and ribosomes. Both also contain cytoplasm and genetic material.
4. Proteins may fail to reach the correct secretory vesicles, reducing or misdirecting secretion because the Golgi sorts cargo for its destination.
5. Water entering the vacuole increases turgor pressure. The rigid wall resists expansion, and the resulting pressure supports the cells and stem.
6. Rough ER bears ribosomes and participates in synthesis and processing of secreted or membrane proteins. Smooth ER lacks attached ribosomes and contributes to lipid synthesis; specialised smooth ER can also store calcium.

Teaching note

For every label, ask what the structure makes possible and whether all cells of that group have it.

Curriculum reference: https://cbseacademic.nic.in/web_material/CurriculumMain27/SecPart2/Biology_SecP2_2026-27.pdf

Selected practice; outcomes are publisher-defined. School practicals, projects and prescribed readings require separate preparation.