Plant Cells Structures and Functions

Guided online worksheet Estimated working time 35 minutes

Name _____	Class _____	Date _____

Read the key knowledge first. Then complete the matching, true or false, and labeling activities. Finish by solving the online cell mystery using evidence from real microscope images.

Key Knowledge Read First

Cell structure	Definition and function
Nucleus	Controls cell activities and contains genetic material called DNA.
Mitochondrion	Releases energy from food during aerobic respiration.
Chloroplast	Contains chlorophyll, which absorbs light for photosynthesis.
Sap vacuole	Contains cell sap and helps keep the plant cell firm.
Cell membrane	Controls what enters and leaves the cell.
Cell wall	A strong cellulose layer that supports the cell and gives it a regular shape.
Cytoplasm	Jelly-like material where many chemical reactions happen.

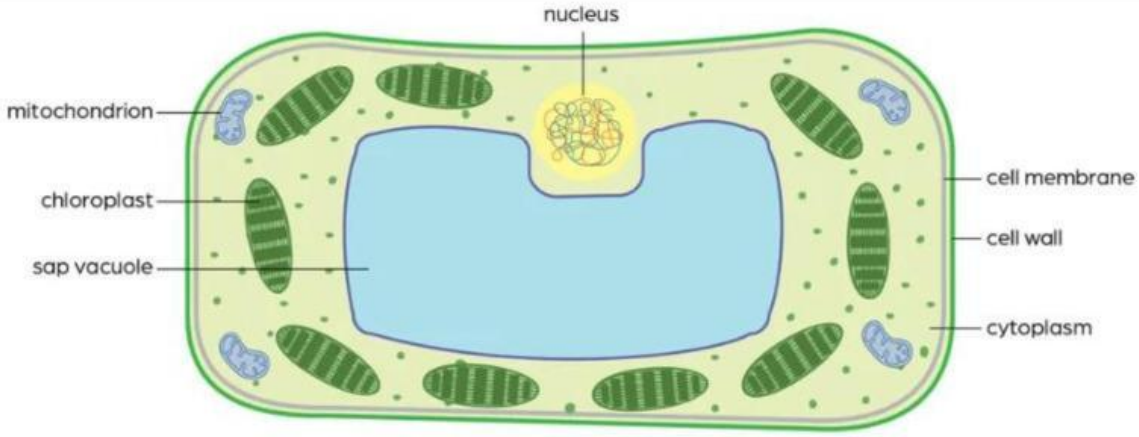


Figure 3.9 Parts of a plant cell

Reference diagram of a typical plant cell

LIVEWORKSHEETS

Check Your Understanding

A Match the Structure to Its Function

Write the correct letter beside each structure. Use each letter once.

Structures	Functions
1 Nucleus Answer _____	A Controls what enters and leaves the cell.
2 Mitochondrion Answer _____	B Contains cell sap and helps keep the cell firm.
3 Chloroplast Answer _____	C Where many chemical reactions happen.
4 Sap vacuole Answer _____	D Controls cell activities and contains DNA.
5 Cell membrane Answer _____	E Supports the cell and gives it a regular shape.
6 Cell wall Answer _____	F Releases energy during aerobic respiration.
7 Cytoplasm Answer _____	G Contains chlorophyll and absorbs light.

B True or False

8 The nucleus controls the activities of the cell. **True** / **False**

9 The cell wall controls which substances enter and leave the cell. **True** / **False**

10 Chloroplasts contain chlorophyll. **True** / **False**

11 Mitochondria release energy during respiration. **True** / **False**

12 The sap vacuole contains DNA. **True** / **False**

13 The cytoplasm is where many chemical reactions happen. **True** / **False**

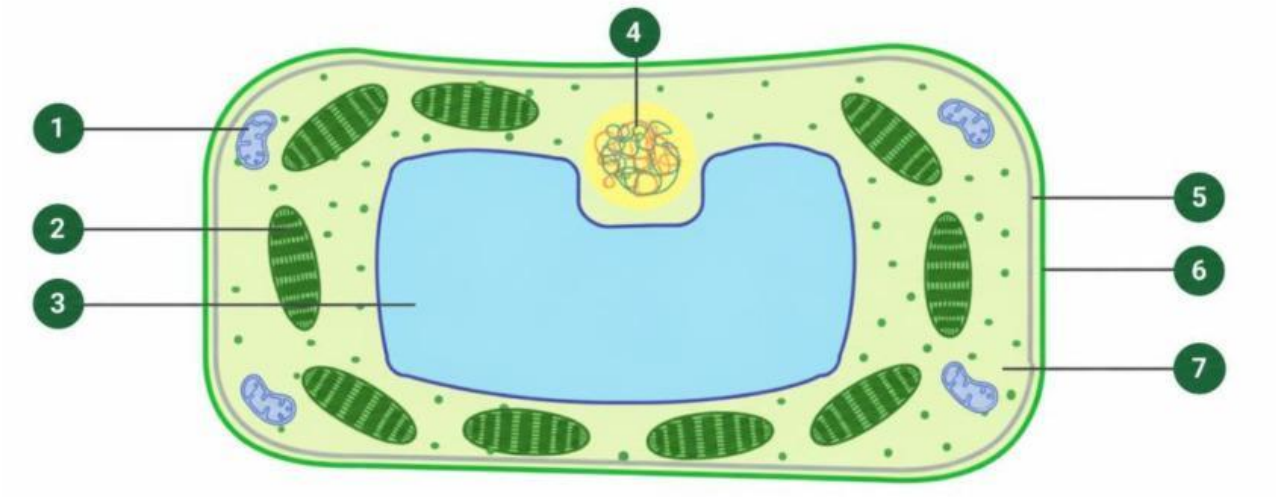
14 All plant cells contain chloroplasts. **True** / **False**

15 The cell wall helps give a plant cell a regular shape. **True** / **False**

LIVEWORKSHEETS

Label and Apply

Use the word bank to label numbers 1 to 7 on the plant cell. The numbers follow the original textbook leader lines.



cell wall **cell membrane** **cytoplasm** **nucleus** **chloroplast** **mitochondrion** **sap vacuole**

1 _____	2 _____	3 _____	4 _____
5 _____	6 _____	7 _____	

Apply Your Knowledge

16 A plant cell is placed in a bright location. Which structure absorbs the light?

17 A cell needs to release energy from food. Which structure carries out this job?

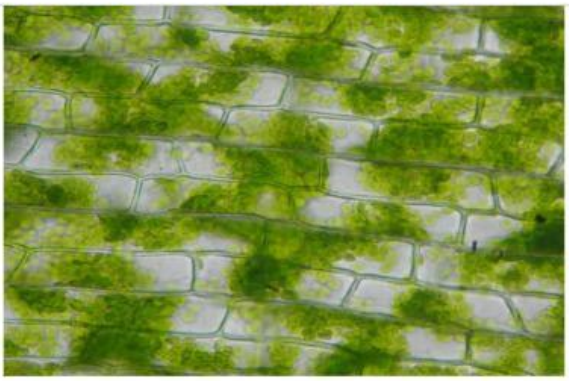
18 Explain one difference between the jobs of the cell wall and cell membrane.

LIVEWORKSHEETS

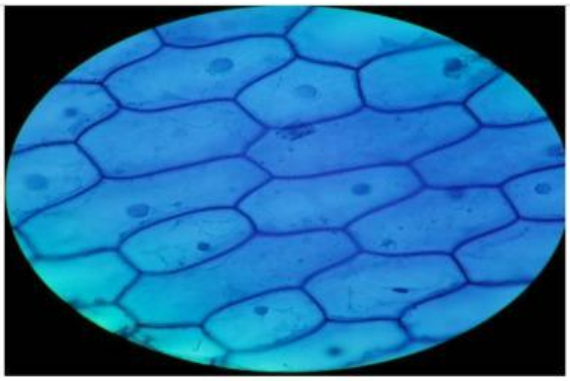
The Mystery of the Missing Chloroplasts

At 8:15 a.m., GreenLab received two microscope slides from a school greenhouse. The labels had fallen off. Slide A showed rows of green cells filled with small oval bodies. Slide B showed pale rectangular cells with clear boundaries but no green bodies. One student announced, “Slide B cannot contain plant cells because it has no chloroplasts.” Your team has been asked to examine the evidence, research the claim, and write the final laboratory verdict.

Evidence Photographs



Evidence A Elodea leaf cells



Evidence B Stained onion epidermal cells

Image sources: Elodea micrograph, Wikimedia Commons; onion epidermal micrograph, David Fankhauser.

Mission One Inspect the Evidence

19 Which evidence photograph clearly shows chloroplasts? What do they look like?

20 Name two features in Evidence B that still suggest the cells are plant cells.

21 Predict why the cells in Evidence B do not have visible chloroplasts.

LIVEWORKSHEETS

Mission Two Follow the Web Trail

Open a browser. Use the search phrases below, then choose a science or education webpage. Do not use the image-results page as your source.

Search phrase 1 Elodea leaf cells under a microscope chloroplasts	Search phrase 2 Do all plant cells have chloroplasts

22 Write the name of one reliable website you used.

23 Paste the webpage link.

24 According to your source, what is the main function of chloroplasts?

25 Do all plant cells contain chloroplasts? Explain your answer.

26 Give one example of a plant cell that normally has few or no chloroplasts.

27 Why would that cell not need many chloroplasts?

Mission Three Reach a Verdict

28 Was the student's claim correct? Write a three-sentence verdict. Use one observation from the photographs and one fact from your web research.

29 A textbook diagram shows organelles clearly, while real microscope images show fewer details. Give one strength and one limitation of the textbook model.

30 Final reflection: Which piece of evidence was most convincing, and why?

Teacher Image Sources

Elodea: https://commons.wikimedia.org/wiki/File:Chloroplasts_-_Microscopic_view_of_Elodea_canadensis.jpg
Onion: https://fankhauserblog.wordpress.com/1993/09/25/cells-the-functional-units-of-organisms/

LIVEWORKSHEETS