SCIENCE FOUNDATIONS

Plant versus animal cells

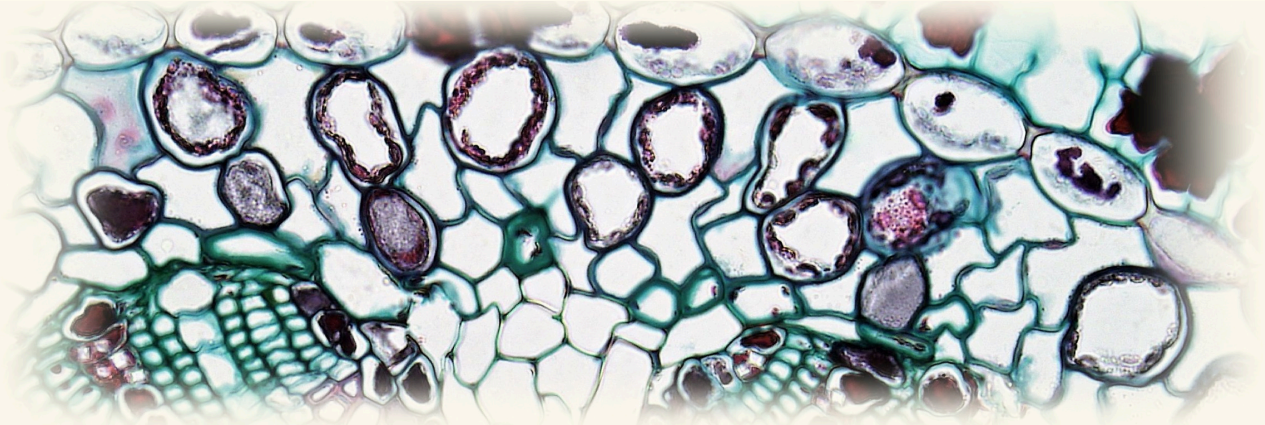
Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how you tell a leaf cell from a cheek cell under a microscope, by spotting the wall, the green chloroplasts, and the big water sac that only plants have. A biology student looking down a microscope can sort a slide in seconds by checking for a cell wall. A cook sees the difference every day, since a crisp lettuce leaf holds its shape because of those stiff walls while meat is soft without them. Knowing plant versus animal cells tells you why plants stand upright without bones and why animal cells need other kinds of support.



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Rule

Plant versus animal cells: plant cells have a cell wall, chloroplasts, and a large central vacuole. Animal cells have none of those three.

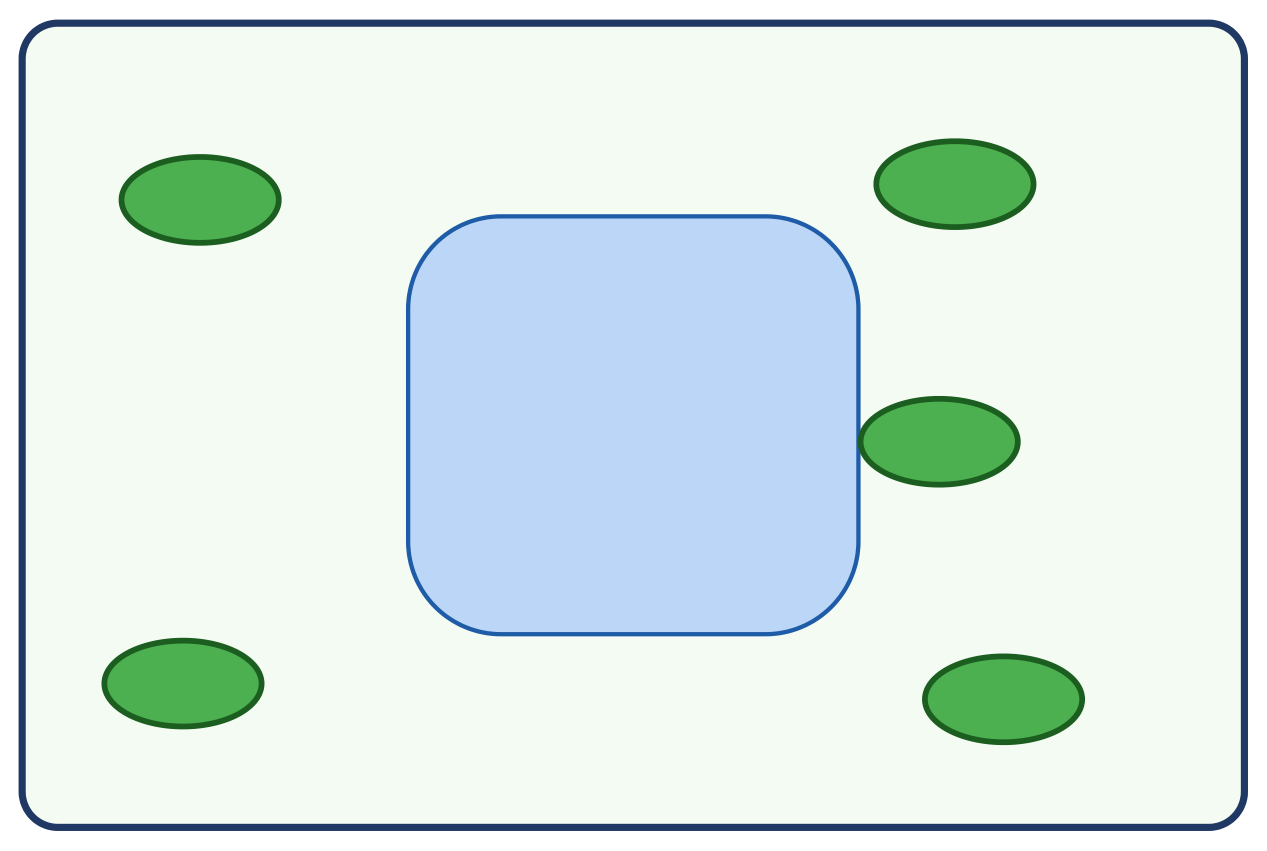
Both have a cell membrane, a nucleus, mitochondria, and cytoplasm (the jelly-like filling of the cell). Check for the plant-only structures first: if any are present, it is a plant cell.

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Worked examples

EXAMPLE 1

Q Identify a cell with a wall, chloroplasts, and a large vacuole.



SOLUTION

Check the plant-only list: wall, chloroplasts, large vacuole.

All three are present here.

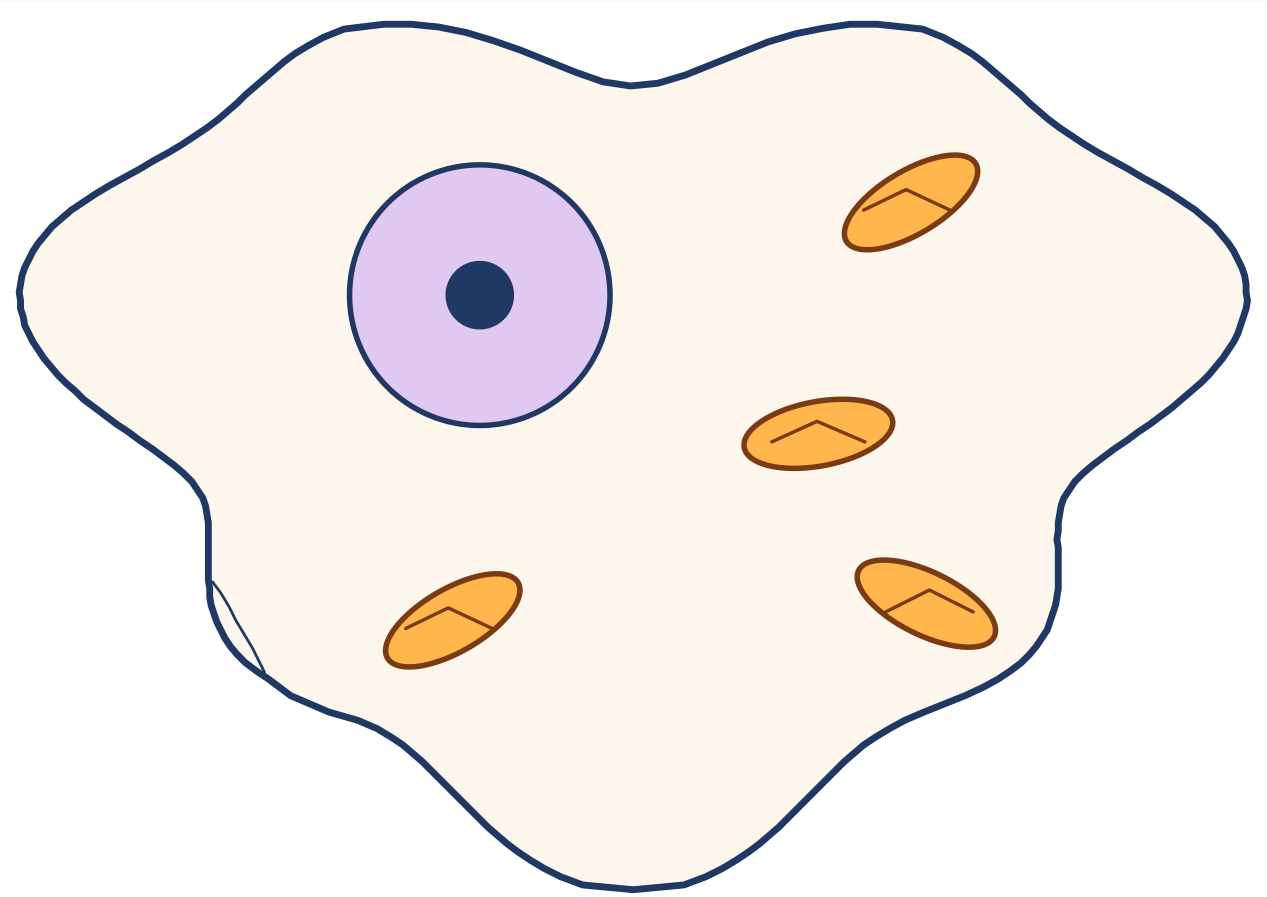
Conclude: plant cell.

The result is plant cell.

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EXAMPLE 2

Q Identify a cell with no wall and no chloroplasts.



SOLUTION

Check the plant-only list: none of those structures are present.

Check the shared list: membrane, nucleus, mitochondria are present.

Conclude: animal cell.

The result is animal cell.

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Practice questions

1 A cell has a cell wall and a large central vacuole, but no chloroplasts. Is it a plant cell or an animal cell?

- **A** Plant cell
- **B** Animal cell

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2 Which structure lets a plant cell make its own food?

- **A** Chloroplast
- **B** Nucleus
- **C** Mitochondrion
- **D** Cell membrane

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3 A cell has a cell membrane, a nucleus and mitochondria, but no cell wall and no chloroplasts. Is it a plant cell or an animal cell?

- A Plant cell
- B Animal cell

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4 Why do plant cells keep a fixed shape while animal cells change shape easily?

- A Plant cells have a stiff cell wall
- B Animal cells have chloroplasts
- C Plant cells have no nucleus
- D Animal cells have a large vacuole

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5 Name one structure found in plant cells only.

- A Cell wall
- B Cell membrane
- C Nucleus
- D Mitochondria

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6 Which structures do both plant and animal cells have?

- A Cell membrane, cytoplasm, nucleus, mitochondria
- B Cell wall, chloroplasts, large vacuole, nucleus
- C Cell membrane, cell wall, chloroplasts, nucleus
- D Cytoplasm, chloroplasts, large vacuole, mitochondria

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7

Which type of cell is usually regular in shape?

A Plant cells

B Animal cells

C Both types equally

D Neither type

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Does an animal cell have a nucleus?

A Yes

B No

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9

A student sees a cell with a nucleus and mitochondria under the microscope. Can she tell whether it is a plant or an animal cell from those two structures alone?

- A No, both cell types have them
- B Yes, only plant cells have them
- C Yes, only animal cells have them
- D No, neither cell type has them

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10

What does the large central vacuole in a plant cell mostly store?

- A Water
- B DNA
- C Chlorophyll
- D Oxygen

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ANSWER KEY

1. Plant cell

2. Chloroplast

3. Animal cell

4. Plant cells have a stiff cell wall

5. Cell wall

6. Cell membrane, cytoplasm, nucleus, mitochondria

7. Plant cells

8. Yes

9. No, both cell types have them

10. Water

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