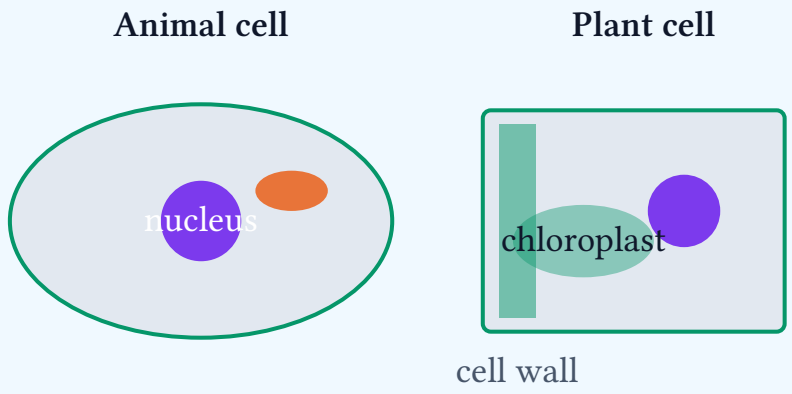
Science 10

Unit C: Cycling of matter in living systems

Organelles and cell types

The cell as a city

- One cell can perform respiration, protein synthesis, and waste management.
- Specialized parts (organelles) divide the labour.



Organelle locations and jobs

- Compare a cheek cell with an Elodea leaf cell.
- List the organelles you can see, and the ones you infer from what the cell does.
- Chloroplasts and a cell wall show up in the leaf cell; the cheek cell lacks both.

Key terms

organelle

A specialized structure within a cell that performs a particular function.

nucleus

The organelle that stores genetic information and directs the cell's activities.

mitochondrion

Organelle where much of aerobic cellular respiration and adenosine triphosphate production occurs.

chloroplast

Plant-cell organelle where photosynthesis occurs.

Key terms

cell wall

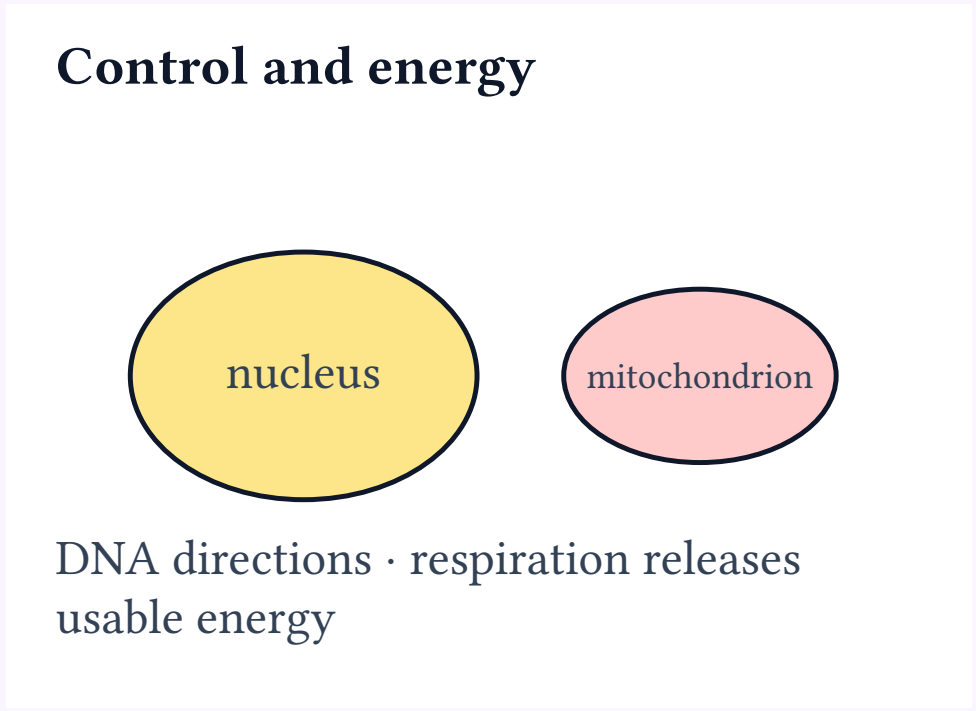
Rigid layer outside the cell membrane that supports and protects plant cells.

vacuole

Membrane-bound compartment used for storage and, in plants, maintenance of turgor.

Control and energy

- The nucleus stores genetic information and directs the cell's activities.
- Mitochondria release usable energy through cellular respiration.
- Ribosomes build proteins, either free in the cytosol or attached to rough endoplasmic reticulum.



Processing and transport

- The endoplasmic reticulum is a membrane network that helps build and move materials.
- The Golgi apparatus modifies proteins, packages them, and sends them onward.
- Lysosomes break materials down for reuse. They stand out more in many animal cells than in plant cells.

Processing and transport

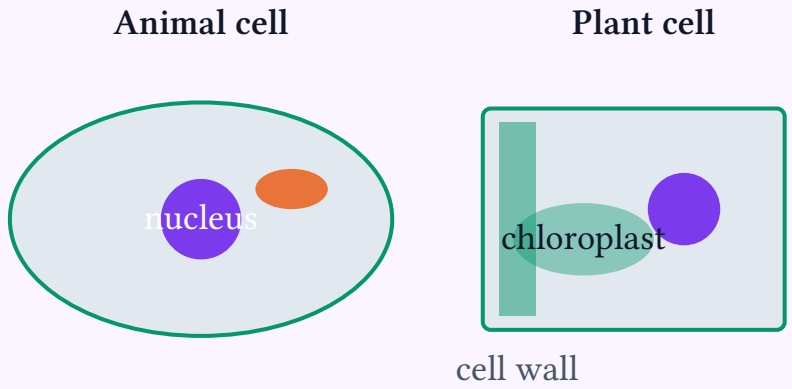


ER builds and moves materials

Golgi modifies and packages

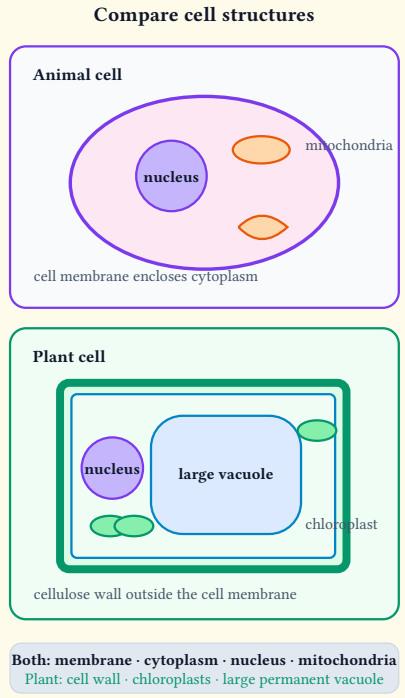
Plant structures

- Chloroplasts capture light for photosynthesis. They belong in plant cells; a typical animal cell lacks them.
- A large central vacuole stores materials and presses outward, which helps the plant cell keep its shape.
- The cell wall is a rigid layer outside the membrane. In plants it contains cellulose.



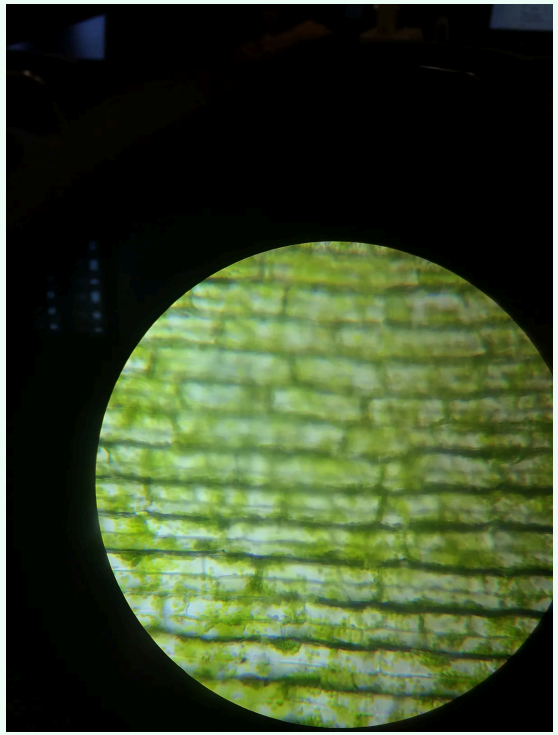
Comparing two cells

- List the organelles you can see, or reasonably infer, in a cheek cell and in an Elodea leaf cell.
- For each structure, say how it supports that organism's life processes.



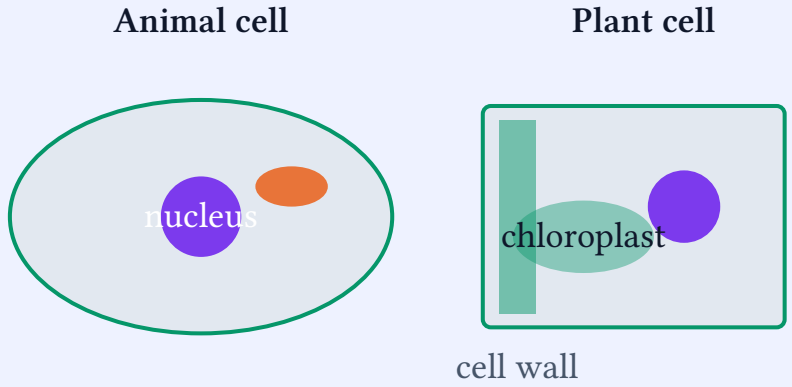
Gallery walk

- At each station, record the organelle's function and whether it is found in plants, animals, or both.
- Connect at least two organelles to one life process, such as making and exporting a protein.



Applications

- Medical imaging and cell biology depend on knowing organelle targets.
- Biotechnology questions often start from how a cell structure works.
- Name the organelle a technique is aimed at, along with the illness or the product.



Organelle match

- Match each structure to its function, and say whether it belongs in plant cells, animal cells, or both.
- A complete answer puts chloroplasts and the cell wall in plant cells only. Centrioles are an optional extension.

Cell structure retrieval check

- Trace a protein from genetic information in the nucleus to export from the cell.
- Name two structures typical of plant cells and explain their functions.
- Explain why a plant cell needs both chloroplasts and mitochondria.

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