

GRADE 8 | 2024

Cells: Basic Unit of Life

Natural Sciences

CAPS ALIGNED

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1. What is a Cell?

The cell is the basic structural and functional unit of all living organisms. Robert Hooke first observed cells in 1665 using a microscope.

KEY POINT: All living things are made of cells. Cells come from pre-existing cells.

2. Types of Cells

Prokaryotic Cells (Bacteria)

- No membrane-bound nucleus
- DNA floats freely in cytoplasm
- No membrane-bound organelles
- Smaller and simpler than eukaryotic cells
- Examples: bacteria, blue-green algae

Eukaryotic Cells (Plant and Animal)

- Have a membrane-bound nucleus
- Contain membrane-bound organelles
- Larger and more complex
- Examples: plant cells, animal cells, fungi

3. Plant Cell vs Animal Cell

Plant Cell (has extras)

- Cell wall (made of cellulose): gives shape and support
- Large central vacuole: stores water and maintains pressure
- Chloroplasts: site of photosynthesis, contain chlorophyll

Animal Cell

- No cell wall
- Small or no vacuoles
- No chloroplasts
- Has centrioles (for cell division)

4. Cell Organelles and Their Functions

- Nucleus: controls all cell activities, contains DNA
- Cell membrane: controls what enters and leaves the cell
- Cytoplasm: jelly-like fluid that holds organelles
- Mitochondria: produces energy (ATP) through respiration
- Ribosomes: site of protein synthesis
- Endoplasmic reticulum: transports materials inside the cell
- Golgi apparatus: packages and exports proteins
- Vacuole: stores water, food, or waste products

FORMULA: CELL THEORY:

1. All organisms are made of cells
2. The cell is the basic unit of life
3. All cells arise from existing cells