CLASS 9 SCIENCE NCERT SOLUTIONS

NCERT Solutions for Class 9 Science Chapter 2: Cell: The Building Block of Life – Free PDF Download

Chapter 2 of Class 9 Science Exploration is Cell: The Building Block of Life — the opening chapter of the biology strand. It introduces the cell as the basic structural and functional unit of all living organisms, the two broad categories of cells, and the organelles that keep a cell alive. These Class 9 Science C...

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Chapter 2 of Class 9 Science *Exploration* is Cell: The Building Block of Life — the opening chapter of the biology strand. It introduces the cell as the basic structural and functional unit of all living organisms, the two broad categories of cells, and the organelles that keep a cell alive. These Class 9 Science Chapter 2 solutions are also useful as quick revision notes before exams.

Prokaryotic and Eukaryotic Cells

Prokaryotic cells (e.g. bacteria) lack a membrane-bound nucleus — their genetic material lies free in the cytoplasm. **Eukaryotic cells** (found in plants, animals, fungi) have a true, membrane-bound nucleus and various membrane-bound organelles.

Plant Cells vs Animal Cells

Both plant and animal cells share a plasma membrane, cytoplasm, nucleus, mitochondria, and endoplasmic reticulum. Plant cells additionally have a rigid **cell wall**, large **vacuoles**, and **chloroplasts** for photosynthesis — features animal cells lack.

Key Organelles and Their Functions

Nucleus — contains genetic material (DNA); controls cell activities.

Mitochondria — the “powerhouse of the cell”; site of cellular respiration and energy (ATP) production.

Chloroplast — found in plant cells; site of photosynthesis.

Endoplasmic Reticulum (ER) — rough ER (with ribosomes) makes proteins; smooth ER makes lipids.

Vacuoles — storage sacs; large and central in plant cells (store water, maintain turgor pressure).

Plasma membrane — selectively permeable boundary controlling what enters/exits the cell.

Cell wall — rigid outer layer in plant cells, made of cellulose, providing structural support.

Cell Membrane Permeability

The plasma membrane is **selectively (semi-)permeable** — it allows some substances through while blocking others, using processes like diffusion and osmosis, which is essential for maintaining a stable internal environment.

Cell Division: Mitosis and Meiosis

Mitosis produces two genetically identical daughter cells from one parent cell, used for growth and repair. **Meiosis** produces four genetically different daughter cells with half the chromosome number, used to form gametes (sex cells) for sexual reproduction. Uncontrolled, abnormal cell division is linked to **cancer**.