

## Class 9<sup>th</sup> – Science

### 1. MATTER IN OUR SURROUNDINGS

- Physical Nature of Matter
- Characteristics of Particles of Matter
- States of Matter
- Can Matter Change its State?
- Evaporation

### 2. IS MATTER AROUND US PURE?

- What is a Mixture?
  - types of mixtures
- What is a Solution?
  - concentration of a solution
  - what is a suspension?
  - what is a colloidal solution?
- Separating the components of a mixture
- Physical and chemical changes
- What are the types of pure substances?
  - Elements
  - compounds

### 3. ATOMS AND MOLECULES

- Laws of Chemical Combination
  - law of conservation of mass
  - law of constant proportions

- What is an Atom?
- What is a Molecule?
  - molecules of elements
  - molecules of compounds
  - what is an ion?
- Writing Chemical Formulae
  - formulae of simple compounds
- Molecular Mass and Mole Concept
  - molecular mass
  - formula unit mass
  - mole concept

#### **4. STRUCTURE OF THE ATOM**

- Charged Particles in Matter
- The Structure of an Atom
  - Thomson's model of an atom
  - Rutherford's model of an atom
  - Bohr's model of atom
  - Neutrons
- How are Electrons Distributed in Different Orbits (Shells)?
  - Valency
- Atomic Number and Mass Number
  - Atomic number
  - Mass number
- Isotopes
  - Isobars

#### **5. THE FUNDAMENTAL UNIT OF LIFE**

- What are Living Organisms Made Up of?
- What is a Cell Made Up of?
  - What is the Structural organization of a Cell?
    - plasma membrane or cell membrane
    - cell wall
    - nucleus
    - cytoplasm
    - cell organelles

## **6. TISSUES**

- Are Plants and Animals Made of Same Types of Tissues?
- Plant Tissues
  - meristematic tissue
  - permanent tissue
- Animal Tissues
  - epithelial tissue
  - connective tissue
  - muscular tissue
  - nervous tissue

## **7. DIVERSITY IN LIVING ORGANISMS**

- What is the Basis of Classification?
- Classification and Evolution
- Classification and Evolution
  - Monera
  - Protista
  - Fungi
  - Plantae
  - Animalia
- Plantae

- Thallophyta
- Bryophyta
- Pteridophyta
- Gymnosperms
- Angiosperms
- Animalia
  - porifera
  - Coelenterata (cnidaria)
  - Platyhelminthes
  - Nematoda
  - Annelida
  - Arthropoda
  - Mollusca
  - Echinodermata
  - Protochordata
  - Vertebrata
- Nomenclature

## **8. MOTION**

- Describing Motion
  - Motion along a straight line
  - Uniform motion and non-uniform motion
- Measuring the rate of motion
- Rate of Change of velocity
- Graphical Representation of Motion
- Equations of Motion by Graphical Method
  - Equation for velocity-time relation
  - Equation for position-time relation

- Equation for position–velocity relation
- Uniform circular motion

## **9. FORCE AND LAWS OF MOTION**

- Balanced and Unbalanced Forces
- First Law of Motion
- Inertia and Mass
- Second Law of Motion
  - Mathematical formulation of second law of motion
- Third Law of motion
- Conservation of momentum

## **10. GRAVITATION**

- Gravitation
  - Universal law of gravitation
  - Importance of the universal law of gravitation
- Free Fall
  - To calculate the value of  $g$
  - motion of objects under the influence of gravitational force of the earth
- Mass
- Weight
  - Weight of an object on the moon
- Thrust and Pressure
  - pressure in fluids
  - Buoyancy

- Why objects float or sink when placed on the surface of water?
- Archimedes' Principle
- Relative Density

## **11. WORK AND ENERGY**

- Work
- Energy
  - Forms of energy
  - kinetic energy
  - Potential energy
  - Potential energy of an object at a height
  - Are various energy forms interconvertible?
  - Law of conservation of energy
- Rate of doing work
  - Commercial unit of energy

## **12. SOUND**

- Production of Sound
- Propagation of Sound
  - Sound needs a medium to travel
  - Sound waves are longitudinal waves
  - Characteristics of a sound wave
  - Speed of sound in different media
- Reflection of Sound
  - Echo
  - Reverberation

- Uses of multiple reflection of sound
- Range of Hearing
- Applications of Ultrasound
  - Sonar
- Structure of Human Ear

### **13. WHY DO WE FALL ILL?**

- Health and its Failure
  - The significance of 'health'
  - Personal and community issues both matter for health
  - Distinctions between 'healthy' and 'disease-free'
- Disease and Its Causes
  - What does disease look like?
  - Acute and chronic diseases
  - Chronic diseases and poor health
  - Causes of diseases
  - Infectious and non-infectious causes
- Infectious Diseases
  - Infectious agents
  - Means of spread
  - Organ-specific and tissue-specific
  - manifestations
  - principles of treatment
  - principles of prevention

### **14. NATURAL RESOURCES**

- The Breath of Life: Air
  - The role of the atmosphere in climate control
  - The movement of air: winds
  - Rain
  - Air pollution
- Water: A wonder Liquid
  - water pollution
- Mineral riches in the Soil
- Biogeochemical Cycles
  - The water-cycle
  - The nitrogen-cycle
  - The carbon-cycle
  - The oxygen-cycle
- Ozone Layer

## **15. IMPROVEMENT IN FOOD RESOURCES**

- Improvement in Crop Yields
  - Crop variety improvement
  - Crop production management
  - Crop protection management
- Animal Husbandry
  - Cattle farming
  - Poultry farming
  - Fish production
  - Bee - keeping