

Science Olympiad Class 9 syllabus

NSO syllabus for class 9 science Olympiad

Class 9 Syllabus
Unit 1: Matter – Its Nature And Behaviour
Definition of matter; solid, liquid and gas; characteristics – shape, volume, density; change of state-melting (absorption of heat), freezing, evaporation (cooling by evaporation), condensation, sublimation.
Nature of matter: Elements, compounds and mixtures. Heterogeneous and homogenous mixtures, colloids and suspensions.
Particle nature, basic units: Atoms and molecules, Law of constant proportions, Atomic and molecular masses.
Mole concept: Relationship of mole to mass of the particles and numbers.
Structure of atoms: Electrons, protons and neutrons, valency, chemical formula of common compounds. Isotopes and Isobars.
Unit 2: Organisation In The Living World
Cell – Basic Unit of life: Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall, cell organelles and cell inclusions; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes – basic structure, number.
Tissues, Organs, Organ System, Organism: Structure and functions of animal and plant tissues (only four types of tissues in animals; Meristematic and Permanent tissues in plants).
Biological Diversity: Diversity of plants and animals – basic issues in scientific naming, basis of classification. Hierarchy of categories / groups, Major groups of plants (salient features) (Bacteria, Thallophyta, Bryophyta, Pteridophyta, Gymnosperms and Angiosperms). Major groups of animals (salient features) (Nonchordates upto phyla and chordates upto classes).
Health and Diseases: Health and its failure. Infectious and Non-infectious diseases, their causes and manifestation. Diseases caused by microbes (Virus, Bacteria and Protozoans) and their prevention; Principles of treatment and prevention. Pulse Polio programmes.
Unit 3: Motion, Force, And Work
Motion: Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, derivation of equations of motion by graphical method; elementary idea of uniform circular motion.

Force and Newton's laws: **Force and Motion, Newton's Laws of Motion, Action and reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration. Elementary idea of conservation of Momentum.**

Gravitation: **Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall.**

Floatation: **Thrust and Pressure. Archimedes' Principle; Buoyancy; Elementary Idea of Relative Density.**

Work, energy and power: **Work done by a Force, Energy, Power; Kinetic and Potential energy; Law of conservation of energy.**

Sound: **Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultrasound; reflection of sound; echo and SONAR. Structure of the Human Ear (Auditory aspect only).**

Unit 4: Our Environment

Physical resources: **Air, Water, Soil. Air for respiration, for combustion, for moderating temperatures; movements of air and its role in bringing rains across India. Air, Water and Soil pollution (brief introduction). Holes in ozone layer and the probable damages.**

Bio-geo chemical cycles in nature: **Water, Oxygen, Carbon and Nitrogen.**

Unit 5: Food Production

Plant and animal breeding and selection for quality improvement and management; Use of fertilizers and manures; Protection from pests and diseases; Organic farming.