हाई स्कूल (कक्षा 9 व 10) स्तर का विज्ञान विषय का पाठ्यक्रम **(NCERT)**

Theme : Food

Unit 1 : Food

Plant and animal breeding and selection for quality improvement and management ; use of fertilizers, manures; protection from pests and diseases; organic farming.

Theme : Materials

Unit 2 : Matter - 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. Heterogenous 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. Valency.*

Chemical formula of common compounds.

Structure of atom : *Electrons, protons and neutrons; Isotopes and isobars.*

Theme : The World of the living

Unit 3 : Organization in the living world.

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, Thalophyta, Bryo phyta, Pteridophyta, gymnosperms and*

Angiosperms). Major groups of animals (salient features) (Non-chordates upto phyla and chordates upto classes).

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; chloroplast, mitochondria, vacuoles, ER, golgi apparatus; nucleus, chromosomes - basic structure, number.*

Tissues, organs, organ systems, organism.

Structure and functions of animal and plant tissues (four types in animals; merismatic and permanent tissues in plants).

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.

Theme : Moving things, people and ideas

Unit 4 : 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 and uniformly accelerated motion, 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, inertia of a body, inertia and mass, momentum, force and acceleration. Elementary idea of conservation of momentum, action and reaction forces.*

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).

Theme : Natural Resources

Unit 5 : 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, nitrogen*

Unit 1 : Chemical Substances - Nature and Behaviour

Acids, bases and salts : *General properties, examples and uses, concept of pH scale, importance of pH in everyday life; preparation and uses of sodium hydroxide, Bleaching powder, Baking soda, washing soda and Plaster of Paris.*

Chemical reactions : *Chemical Equation, Types of chemical reactions : combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction in terms of gain and loss of oxygen and hydrogen.*

Metals and non metals : *General properties of Metals and Non-metals, reactivity series, Formation and properties of ionic compounds, Basic Metallurgical processes, corrosion and its prevention.* **Carbon Compounds :** *Covalent bonding in carbon compounds. Versatile nature of carbon, Nomenclature of carbon compounds, Functional groups, difference between saturated hydrocarbons and unsaturated hydrocarbons, Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.*

Periodic classification of elements : *Modern Periodic table, Gradation in Properties.*

Theme : The world of the living

Unit 2 : World of Living

Life Processes : *"living" things; Basic concept of nutrition, respiration, transport and excretion in plants and animals.*

Control and Co-ordination in animals and plants : *Tropic movements in plants; Introduction to*

plant hormones; control and co-ordination in animals : voluntary, involuntary and reflex action,

nervous system; chemical co-ordination : animal hormones.

Reproduction : *Reproduction in animal and plants (asexual and sexual). Need for and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women's health.*

Heridity and evolution : *Heridity; Origin of life : brief introduction; Basic concepts of evolution.*

Theme : How things work.

Unit 3 : Effects of Current

Potential difference and electric current. Ohm's law; Resistance, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors; Heating effect of Electric current; Electric Power, Inter relation between P, V, I and R.

Magnets : *Magnetic field, field lines, field due to a current carrying wire, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's left hand rule. Electro magnetic induction. Induced potential difference, Induced current. Fleming's Right Hand Rule, Direct current. Alternating current; frequency of AC. Advantage of AC over DC. Domestic electric circuits.*

Theme : Natural Phenomena

Unit 4 : *Reflection of light at curved surfaces, Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length. Mirror Formula (Derivation not required), Magnification.*

Refraction; laws of refraction, refractive index.

Refraction of light by spherical lens, Image formed by spherical lenses, Lens formula (Derivation not required),Magnification. Power of a lens; Functioning of a lens in human eye, problems of vision and remedies, applications of spherical mirrors and lenses.Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life.

Theme : Natural Resources

Unit 5 : Conservation of natural resources : *Management of natural resources. Conservation and judicious use of natural resources. Forest and wild life, coal and petroleum conservation. Examples of People's participation for conservation of natural resources.*

The Regional environment : *Big dams : advantages and limitations; alternatives if any. Water harvesting. Sustainability of natural resources.*

Sources of energy : *Different forms of energy, conventional and non-conventional sources of energy: fossil fuels, solar energy; biogas; wind, water and tidal energy; nuclear. Renewable versus non-renewable sources.*

Our Environment : *Eco-system, Environmental problems, their solutions. Biodegradable and non-biodegradable, substances ozone depletion.*