Science

(Theory)

Theme : Materials (55 Periods)

Unit 1 : Chemical Substances - Nature and Behaviour

Acids, bases and salts : Their definitions in terms of furnishing of H+ and OH— ions, General properties, examples and uses, concept of pH scale (Definition relating to logarithm not required), 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, Balanced chemical equation, Implications of a balanced Chemical equation, Types of chemical reactions : combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation and reduction.

Metals and non metals : 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, Homologous series Nomenclature of carbon compounds containing, Functional groups (halogens, alcohol, ketones, aldehydes, alkanes and alkynes), difference between saturated hydrocarbons and unsaturated hydrocarbons, Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Ethanol and Ethanoic acid (only properties and uses), soaps and detergents.
Periodic classification of elements : Need for classification, Modern Periodic table, Gradation in Properties.
Valency, Atomic number, metallic and non-metallic properties.

Theme : The world of the living (50 Periods)

Unit 2 : World of Living

Life Processes : "living being"; 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 : nervous system; voluntary, involuntary and reflex action, chemical co-ordination : animal hormones.
Reproduction : Reproduction in animal and plants (asexual and sexual). Reproductive health-need for and methods of family planning. Safe sex vs HIV/AIDS. Child bearing and women's health.
Heredity and evolution : Heredity; Model's contribution- Rules for inheritance of traits; Sex

determination: brief introduction; Basic concepts of evolution.

Theme : How things work. (35 Periods)

Unit 3 : Effects of Current

Electric currecnt, potential difference and electric current. Ohm's law; Resistance, Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life ; Heating effect of Electric current and its applications in daily life. Electric Power, Inter relation between P, V, I and R. Magnetic effects of current : Magnetic field, field lines, field due to a current carrying conductor, 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 (20 Periods)

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, defects of vision and their corrections, 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 (20 Periods)

Unit 5 : Management 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, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable, substances.