

**SYLLABUS - 2021 - 2022**

**STANDARD : 10**

**SUBJECT : SCIENCE**

Unit	Content
<b>1. Laws of Motion</b>	Introduction 1.1 Force and Motion 1.2 Inertia 1.2.1 Types of Inertia 1.2.2 Examples of Inertia 1.3 Linear Momentum 1.4 Newton's Laws of Motion 1.4.1 Newton's First Law 1.4.2 Force 1.4.3 Types of forces 1.4.4 Resultant Force 1.5 Newton's Second Law of Motion 1.7 Newton's Third Law of Motion 1.9 Rocket propulsion 1.10 Gravitation 1.10.1 Newton's Universal law of gravitation 1.11 Mass and Weight
<b>2. Optics</b>	Introduction 2.1 Properties of light 2.2 Refraction of Light 2.2.1 First Law of Refraction 2.2.2 Second Law of Refraction 2.3 Refraction of composite Light - Dispersion of Light 2.5 Lenses 2.5.1 Other Types of Lenses 2.6 Images formed due to refraction through a convex and concave lens 2.7. Refraction through a convex lens 2.8 Applications of a Convex lens 2.9 Refraction through a concave lens 2.10 Applications of concave lenses 2.11 Lens Formula 2.12 Sign Convention 2.16 Human eye 2.17 Defects in eye

<p><b>3. Thermal Physics</b></p>	<p>Introduction</p> <p>3.1 Temperature</p> <p>3.1.1 Absolute scale (Kelvin scale) of temperature</p> <p>3.1.2 Thermal equilibrium</p> <p>3.2 Thermal Energy</p> <p>3.2.1 Characteristic features of heat energy transfer</p> <p>3.2.2 Other units of Heat energy</p> <p>3.4 Fundamental laws of gases</p> <p>3.4.1 Boyle's law</p> <p>3.4.2 Charles' law</p> <p>3.4.3 Avogadro's law</p> <p>3.5 Gases</p> <p>3.5.1 Real gases</p> <p>3.5.2 Ideal gases</p>
<p><b>4. Electricity</b></p>	<p>Introduction</p> <p>4.1 Electric Current</p> <p>4.1.1 Definition of Electric Current</p> <p>4.1.2 SI unit of Electric current</p> <p>4.2 Electric circuit</p> <p>4.2.1 Electrical components</p> <p>4.3 Electric potential and Potential difference</p> <p>4.3.1 Electric Potential</p> <p>4.3.2 Electric Potential Difference</p> <p>4.3.3 Volt</p> <p>4.4 Ohm's law</p> <p>4.5 Resistance of a material</p> <p>4.5.1 Unit of Resistance</p> <p>4.6 Electrical resistivity and electrical conductivity</p> <p>4.6.1 Electrical resistivity</p> <p>4.6.2 Conductance and Conductivity</p> <p>4.8 Heating effect of current</p> <p>4.8.1 Joule's Law of Heating</p> <p>4.9 Electric power</p> <p>4.9.1 Unit of electric power</p> <p>4.9.2 Consumption of electrical energy</p>

<p><b>5. Acoustics</b></p>	<p>Introduction</p> <p>5.1 Sound waves</p> <p>5.1.1 Longitudinal Waves</p> <p>5.1.2 Categories of Sound waves based on their frequencies</p> <p>5.1.3 Difference between the sound and light waves</p> <p>5.2 Reflection of sound</p> <p>5.2.1 Laws of reflection</p> <p>5.2.2 Reflection at the boundary of a denser medium</p> <p>5.2.3 Reflection at the boundary of a rarer medium</p> <p>5.2.4 Reflection of sound in plane and curved surfaces</p> <p>5.3 Echoes</p> <p>5.3.1 Conditions necessary for hearing echo</p> <p>5.3.2 Applications of echo</p>
<p><b>6. Nuclear Physics</b></p>	<p>Introduction</p> <p>6.1. Radioactivity</p> <p>6.1.1 Discovery of radioactivity</p> <p>6.1.2 Definition of radioactivity</p> <p>6.1.3 Natural Radioactivity</p> <p>6.1.4 Artificial Radioactivity (or) Induced Radioactivity</p> <p>6.1.5 Units of Radioactivity</p> <p>6.2. Alpha, beta and gamma rays</p> <p>6.2.1 Properties of Alpha, Beta and Gamma rays</p> <p>6.2.2 Radioactive displacement law</p> <p>6.2.3 Alpha decay</p> <p>6.2.4 Beta decay</p> <p>6.2.5 Gamma decay</p> <p>6.5. Uses of Radioactivity</p> <p>6.5.1 Agriculture</p> <p>6.5.2 Medicine</p> <p>6.5.3 Industries</p> <p>6.5.4 Archaeological Research</p> <p>6.6. Safety measures</p> <p>6.6.1 Permitted range</p> <p>6.6.2 Preventive Measures</p>

<p><b>7. Atoms and Molecules</b></p>	<p>Introduction</p> <p>7.1 Atom and Atomic mass</p> <p>7.1.1 Relative Atomic mass (REM)</p> <p>7.2 Molecule and molecular mass</p> <p>7.2.1 Classification of molecules</p> <p>7.3 Difference between atoms and molecules</p> <p>7.6 Avogadro hypothesis</p> <p>7.7. Applications of Avogadro's Law</p> <p>7.9 Solved problems (Problems related to the above mentioned topics only)</p>
<p><b>8. Periodic Classification of Elements</b></p>	<p>Introduction</p> <p>8.1 Modern periodic law</p> <p>8.2 Modern periodic table</p> <p>8.2.1 Features of periods</p> <p>8.2.2 Features of groups</p> <p>8.6. Properties of metals</p> <p>8.6.1 Physical properties</p> <p>8.6.2 Chemical properties</p> <p>8.10 Alloys</p> <p>8.10.1 Amalgam</p> <p>8.10.2 Method of making alloys</p> <p>8.10.3 Types of alloys</p> <p>8.11 Corrosion</p> <p>8.11.2 Methods of preventing corrosion</p>
<p><b>9. Solutions</b></p>	<p>Introduction</p> <p>9.2 Components of solutions</p> <p>9.3 Types of solutions</p> <p>9.3.1 Based on the physical state of the solute and the solvent</p> <p>9.3.2 Based on the type of solvent</p> <p>9.3.3 Based on the amount of solute</p> <p>9.3.4 Concentrated and dilute Solutions</p> <p>9.6 Hydrated salts and water of crystallization</p>

	<p>9.6.1 Copper sulphate pentahydrate</p> <p>9.6.2 Magnesium sulphate heptahydrate</p> <p>9.7 Hygroscopy</p> <p>9.8 Deliquescence</p>
<b>10. Types of Chemical Reactions</b>	<p>Introduction</p> <p>10.1 Types of Chemical reactions</p> <p>10.1.1 Classification based on the nature of rearrangements of atoms</p> <p>10.1.2 Classification based on the direction of reaction</p> <p>10.4 Ionic product of water</p> <p>10.5 pH scale</p> <p>10.7 pH calculations</p> <p>10.8 Problems</p>
<b>11. Carbon and its Compounds</b>	<p>Introduction</p> <p>11.1 General characteristics of organic compounds</p> <p>11.2 Classification of organic compounds based on the pattern of carbon chain</p> <p>11.3 Classes of organic compounds (Based on the kind of atoms)</p> <p>11.3.1 Hydrocarbons</p> <p>11.3.2 Characteristics of hydrocarbons</p> <p>11.3.3 Classification of organic compounds based on functional groups</p> <p>11.4 Homologous series</p> <p>11.4.1 Characteristics of homologous series</p> <p>11.5 Nomenclature of organic compounds</p> <p>11.5.1 Why do we need nomenclature?</p> <p>11.5.2 Components of an IUPAC name</p> <p>11.5.3 IUPAC rules for naming organic compounds</p> <p>11.5.4 IUPAC nomenclature of hydrocarbons – Solved Examples</p> <p>11.5.5 IUPAC nomenclature of other classes – Solved Examples</p> <p>11.6 Ethanol</p> <p>11.6.1 Manufacture of ethanol</p> <p>11.6.2 Physical properties</p> <p>11.6.3 Chemical properties</p> <p>11.6.4 Uses of ethanol</p> <p>11.8 Organic compounds in daily life</p>

<p><b>12. Plant Anatomy and Plant Physiology</b></p>	<p>Introduction  12.1 Tissues  12.2 Tissue system  12.2.1 Dermal or Epidermal tissue system  12.2.2 Ground tissue system  12.2.3 Vascular tissue system  12.3 Internal structure of dicot root (Bean)  12.5 Internal structure of dicot Stem (Sunflower)  12.7 Internal structure of dicot or dorsi-ventral leaf (Mango)  12.9 Plant Physiology  12.9.1 Plastids  12.9.2 Structure of chloroplast  12.9.3 Functions of chloroplast  12.9.4 Photosynthesis  12.9.5 Where does photosynthesis occur?  12.9.6 Photosynthetic pigments  12.9.7 Role of sunlight in photosynthesis  12.9.8 Factors affecting photosynthesis  12.11 Types of respiration  12.11.1 Aerobic respiration (Except Stages)  12.11.2 Anaerobic respiration  12.11.3 Respiratory quotient</p>
<p><b>14. Transportation in Plants and Circulation in Animals</b></p>	<p>Introduction  14.1 Means of Transport in Plants  14.1.1 Diffusion  14.1.2 Active Transport  14.1.3 Osmosis  14.2 Root hair - water absorbing unit  14.3 Pathway of water absorbed by roots  14.4 Types of movement of water into the root cells  14.4.1 Apoplast Pathway  14.4.2 Symplast Pathway  14.5 Transpiration  14.5.1 Factors affecting transpiration,  14.6 Root pressure  14.7 Uptake of minerals  14.8 Translocation of Mineral Ions  14.9 Phloem Transport  14.10 Translocation of sugars</p>

	<p>14.12 Blood</p> <p>14.15 Structure of Human heart</p> <p>14.15.2 Heart Beat</p> <p>14.17 Blood Groups</p>
<b>16. Plant and Animal Hormones</b>	<p>Introduction</p> <p>16.1 Plant Hormones</p> <p>16.1.1 Auxins (Except Went's Experiment)</p> <p>16.1.2 Cytokinins</p> <p>16.1.3 Gibberellins</p> <p>16.2 Human Endocrine glands</p> <p>16.2.1 Pituitary Gland</p> <p>16.2.2 Thyroid Gland</p> <p>16.2.4 Pancreas (Islets of Langerhans)</p> <p>16.2.5 Adrenal Gland</p> <p>16.2.6 Reproductive Glands</p> <p>16.2.7 Thymus Gland</p>
<b>17. Reproduction in Plants and Animals</b>	<p>Introduction</p> <p>17.3 Sexual Reproduction in Plants</p> <p>17.3.1 Parts of a Typical Flower</p> <p>17.3.2 Structure of the Ovule</p> <p>17.4 Pollination</p> <p>17.4.1 Types of Pollination</p> <p>17.6 Fertilization in Plants</p> <p>17.7 Sexual reproduction in human</p> <p>17.7.1 Male reproductive organ - Structure of Testes</p> <p>17.7.2. Female reproductive organ - Structure of Ovary</p> <p>17.8 Gametogenesis</p> <p>17.8.1 Structure of human Sperm</p> <p>17.8.2 Structure of human Ovum</p> <p>17.9 Menstrual cycle - Process of Ovulation</p> <p>17.14 Personal Hygiene</p> <p>17.14.1 Body Hygiene</p> <p>17.14.2 Toilet Hygiene</p> <p>17.14.3 Menstrual and napkin Hygiene</p>

<p><b>18. Genetics</b></p>	<p>Introduction</p> <p>18.1 Gregor Johann Mendel – Father of Genetics</p> <p>18.2 Monohybrid cross-Inheritance of one gene</p> <p>18.3 Dihybrid Cross- Inheritance of two genes and Law of Independent Assortment</p> <p>18.4 Mendel’s laws</p> <p>18.5 Chromosomes, DNA and genes</p> <p>18.5.1 Structure of a Chromosome</p> <p>18.5.4. Karyotype</p> <p>18.6 Structure of DNA</p> <p>18.6.1 Watson and Crick model of DNA</p> <p>18.6.2 DNA Replication</p> <p>18.6.3 Significance of DNA</p> <p>18.7. Sex Determination</p> <p>18.7.1. Sex Determination in Human</p>
<p><b>19. Origin and Evolution of Life</b></p>	<p>Introduction</p> <p>19.1 Theories on origin of life</p> <p>19.3 Theories of Evolution</p> <p>19.3.1 Lamarckism</p> <p>19.3.2 Darwinism or Theory of natural selection</p> <p>19.6 Ethnobotany</p>
<p><b>20. Breeding and Biotechnology</b></p>	<p>Introduction</p> <p>20.2 Green Revolution</p> <p>20.2.4 Plant breeding for improved nutritional quality</p> <p>20.3 Methods of Plant Breeding for Crop Improvement</p> <p>20.3.1 Introduction of new varieties of plants</p> <p>20.3.2 Selection</p> <p>20.3.3 Polyploidy Breeding</p> <p>20.3.4 Mutation Breeding</p> <p>20.3.5 Hybradisation</p> <p>20.4 Animal Breeding</p> <p>20.4.1 Inbreeding</p> <p>20.4.2 Outbreeding</p> <p>20.4.3 Heterosis</p> <p>20.6 Biotechnology in Medicine</p>



<b>21. Health and Diseases</b>	Introduction
	21.1 Abuse and types of abuse
	21.1.1 Child Abuse
	21.1.2 Sexual Abuse
	21.1.3 Child Sexual Abuse
	21.1.4 Approaches for protection of an abused child
	21.2 Drug and tobacco abuse
	21.3 Drug abuse
	21.3.1 Types of Drug
	21.3.2 Drug dependence
	21.3.3 Behavioural changes of drug users
	21.3.4 Drug De-addiction
	21.4 Tobacco abuse
	21.4.1 Tobacco Use
	21.4.2 Smoking Hazards and effects of Tobacco
	21.4.3 Prevention of smoking
	21.5 Alcohol abuse
	21.5.1 Harmful effects of alcohol to health
	21.6 Rehabilitation measures for alcoholics
	21.9 Obesity
	21.9.1 Prevention and control of obesity
	21.11 Cancer
	21.11.1 Types of Cancer
	21.11.2 Carcinogenic agents
	21.11.3 Treatment of Cancer
21.11.4 Preventive measures for cancer	
21.12 AIDS	
21.12.1 Transmission of HIV	
21.12.2 Symptoms and treatment of AIDS	
21.12.3 Prevention and control of AIDS	

<p><b>22. Environmental Management</b></p>	<p>Introduction</p> <p>22.1 Conservation and judicious use of Resources</p> <p>22.5 Renewable and non-renewable Energy Resources</p> <p>22.5.1 Fossil Fuels</p> <p>22.5.2 Coal and Petroleum</p> <p>22.5.3 Steps to conserve coal and petroleum resources</p> <p>22.6 Non-Conventional (Alternative) Energy Resources</p> <p>22.6.3 Shale gas</p> <p>22.6.5 Water energy</p> <p>22.6.6 Tidal energy</p> <p>22.7 Rainwater Harvesting</p> <p>22.8. Electrical Energy Management</p> <p>22.9 E-Waste and its management</p>
<p><b>Practical</b></p>	<p>2. Determination of focal length of a convex lens</p> <p>3. Determination of resistivity</p> <p>4. Identification of exothermic and endothermic reactions</p> <p>5. Testing the solubility of salt</p> <p>8. Photosynthesis</p> <p>10. Mendel's monohybrid cross</p> <p>13. Identification of blood cells</p>