

Telangana Board Class 10 Science Syllabus

Subject	Science
	<p>Reflection of light at curved surface</p> <p>1.1 Normal to the curved surface</p> <p>1.2 Spherical mirrors, convex and concave mirrors</p> <p>1.3 Pole, Focus, Centre of curvature, principle axis, Radius of curvature, Focal length</p> <p>1.4 Images formed by spherical mirrors</p> <p>1.5 Ray diagrams for spherical mirrors</p> <p> 1.5.1 Rules for Ray diagrams by sign laws of reflection</p> <p>1.6 Formula for spherical mirrors – sign convention</p> <p> 1.6.1 Magnification</p> <p>1.7 Application of reflection – Solar Cooker</p>
Physical Science	<p>Chemical Equations and Reactions</p> <p>2.1 Some daily life examples of chemical reactions.</p> <p>2.2 Chemical equations – writing chemical equations, skeletal chemical equations, balancing chemical equations</p> <p>2.3 Writing symbols of physical states, Heat changes, gas evolved and precipitate formed</p> <p>2.4 Interpreting a balanced chemical equation</p> <p> 2.4.1 Calculations based on mass, volume, number of molecules and moles</p>
	<p>Acids, Bases and Salts</p> <p>3.1 Chemical properties of acids & bases</p> <p> 3.1.1 Acids & Bases in laboratory – Indicators</p> <p> 3.1.2 Reaction of Acids & Bases with Metals</p> <p> 3.1.3 Reaction of Acids & Bases with Metal Carbonates and Metal hydrogen carbonates</p> <p> 3.1.4 Reaction of Acids & Bases with each other (Neutralization)</p> <p> 3.1.5 Reaction of Acids with Metallic oxides</p> <p> 3.1.6 Reaction of Bases with Non-Metallic oxides</p>

3.2 What do acids have in common? What do bases have in common?

3.3 Do Acids produce Ions only in Aqueous Solution ?

3.4 Reaction of Acid, Base with water

3.5 Strength of Acid or Base – pH scale

3.6 Importance of pH in everyday life

3.6.1 Sensitivity of plants and animals to pH

3.6.2 pH of soils, pH in the digestive system, pH tooth decay

3.6.3 Self defense by animals and plants through chemical warfare

3.7 Salts

3.7.1 Family of salts

3.7.2 pH of salts

3.8 Chemicals from common salt

3.8.1 Common salt – a raw material for other chemicals

3.8.2 Preparation of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and uses

3.8.3 Removing of water of crystallization

3.8.4 Plaster of Paris

Refraction of light at curved surface

4.1 Refraction of light at curved surface

4.1.1 Image formation – Derivation of curved surface formula

4.2 Lenses

4.2.1 Focal length of the lens

4.3 Rules for Ray diagram

4.4 Images formed by the lenses

4.5 Formula derived for thin lenses

4.6 Focal length of lens depends on the surrounding medium

4.7 Lens maker formula

Human eye and colourful world

5.1 Least distance of distinct vision, Angle of vision

5.2 Structure of human Eye – Focal length of human Eye lens, accommodation

5.3 Common accommodation defects of vision – Myopia, Hypermetropia,

presbyopia

5.3.1 Power of lens

5.4 Prism

5.4.1 Refractive Index of Prism

5.4.2 Derivation of formula for Refractive Index of Prism

5.5 Dispersion

5.5.1 Rainbow

5.6 Scattering of light

Structure of atom

6.1 Spectrum

6.1.1 Wave nature of light

6.2 Electromagnetic Spectrum

6.2.1 Planck's theory

6.3 Bohr's model of Hydrogen atom and its limitations

6.3.1 Bohr – Sommerfeld model of an Atom

6.4 Quantum mechanical model of an Atom

6.4.1 Quantum numbers

6.4.2 Main shells, Subshells and orbitals in different subshells

6.4.3 Shapes of s, p & d orbitals

6.5 Electronic Configuration of elements in their atoms

6.6 nlx rule, Energies of electronic energy levels $(n+l)$ rule ; Aufbau Principle, Pauli's principle, Hund's Rule of maximum multiplicity, Stable configurations

Classification of Elements – The Periodic Table

7.1 Need for arrangement of elements in an organized manner

7.1.1 Historical background of classification of elements

7.2 Doberieners Triads – Limitations

7.3 Newland's law of Octaves

7.4 Mendeleev's Periodic Table (Periodic law, Achievements & Limitations)

7.5 Modern Periodic Table.

7.5.1 Position of Elements in Modern Periodic Table

- Groups
- Periods
- Metals and Non-metals

7.5.2 Trends in Modern Periodic Table (Valency, Atomic size, Ionization Energy, Electron Affinity, Electronegativity, Metallic & Non-metallic properties)

Chemical Bonding

8.1 Chemical bond definition (brief explanation)

8.1.1 Lewis Symbols (or) Lewis Dot Structures

8.2 Electronic theory of Valence by Lewis and Kossel

8.2.1 Octet Rule

8.3 Ionic and Covalent bonds: examples with Lewis Dot formulae

8.3.1 The arrangement of Ions in Ionic compounds

8.3.2 Factors affecting the formation of cation and anion

8.4 Shapes, bond lengths and bond energies in molecules

8.5 Valence shell electron pair repulsion theory

8.6 Valence bond theory – examples like H₂, Cl₂, H₂O, BF₃, CH₄, NH₃, C₂H₆, C₂H₄, C₂H₂ etc

8.7 Hybridisation and explanation of H₂O, BF₃, CH₄, NH₃ etc., molecules

8.8 Properties of Ionic and Covalent Compounds

Electric Current

9.1 Electric current

9.1.1 $I = Q / t$

9.1.2 $I = nqAVd$

9.2 Potential difference

9.3 How a battery or a cell works

9.3.1 EMF

9.4 Ohms law and its limitations, resistance, specific resistance, factors influencing resistance, electric shock

9.5 Electric Circuits

9.5.1 Series and parallel connection of resistances

9.5.2 Kirchoff's Laws

9.6 Electric power

9.7 Safety fuses

Electromagnetism

10.1 Oersted Experiment

10.2 Magnetic field – field lines

10.2.1 Magnetic Flux – Magnetic Flux density

10.3 Magnetic field due to currents

10.3.1 Due to current carrying straight wire

10.3.2 Due to circular loop

10.3.3 Solenoid

10.4 Magnetic force on moving charge and current carrying wire

10.4.1 Right hand rule

10.5 Electric motor

10.6 Electromagnetic induction – Faraday's law (including magnetic flux) – Lenz law

10.6.1 Derivation of Faraday's law

10.6.2 Applications of Faraday's law of electromagnetic induction

10.7 Generators and Alternating – Direct Currents

Principles of Metallurgy

11.1 Occurrence of Metals in nature

11.2 Extraction of metals from the Ores – activity series and related metallurgy, flow chart of steps involved in the extraction of metals from ore.

11.2.1 Enrichment of ores (Concentration or Dressing)

11.2.2 Extraction of Crude metal from the ore

- Extracting metals low in the activity series
- Extracting metal in the middle of the activity series
- Extracting metal in the top of the activity series

11.2.3 Refining metals (purification of the crude metal)

- Electrolytic refining
- Distillation
- Poling

- Liquation

11.3 Corrosion – Prevention of Corrosion

11.4 Important Processes used in metallurgy

- 11.4.1 Smelting

- 11.4.2 Rosting

- 11.4.3 Calcination

11.5 Flux

11.6 Furnace

Carbon and its compounds

12.1 Introduction of Carbon compounds

12.2 Promotion of an Electron – Bonding in Carbon including Hybridization

12.3 Allotropes of Carbon

- Amorphous Forms

- Crystalline Forms (Diamond, Graphite, C60 and Nanotubes)

12.4 Versatile nature of carbon

- 12.4.1 Catenation and tetravalency

12.5 Hydrocarbons

- 12.5.1 Open and Closed Chain Hydrocarbons

- 12.5.2 Saturated and Unsaturated Hydrocarbons

12.6 Bonding of carbon with other elements

- 12.6.1 Functional groups in carbon compounds

12.7 Isomerism

12.8 Homologous series (Alkanes, Alkenes and Alkynes)

12.9 Nomenclature of Carbon compounds

12.10 Chemical properties of carbon compounds

- 12.10.1 Combustion reactions

- 12.10.2 Oxidation Reaction (Alcohol to Acids)

- 12.10.3 Addition reactions

- 12.10.4 Substitution reactions

12.11 Important carbon compounds

12.11.1 Ethanol

12.11.2 Properties of Ethanol – General properties, reaction of ethanol with sodium, reaction with hot concentrated sulphuric acid.

12.11.3 Ethanoic acid

12.11.4 Properties of Ethanoic acid – General properties, Reaction with a base, sodium hydroxide, sodium carbonate and sodium hydrogen carbonate

12.12 Esterification reactions

12.13 Soaps – Saponification, Micelles

12.13.1 Cleansing action of Soap

Nutrition

1.1 Life process- Introduction

1.1.1 Autotrophic and heterotrophic nutrition

1.2 Photosynthesis

1.2.1 Understand the concept of photosynthesis

1.2.2 Raw materials required for photosynthesis – H₂O, CO₂ sunlight

1.2.3 Process of releasing oxygen in photosynthesis

1.2.4 Necessity of light for formation of carbohydrate

1.2.5 Chlorophyll – Photosynthesis

1.2.6 Where does photosynthesis takes place

1.2.7 Mechanism of photosynthesis :

(i) Light reaction, (ii) Dark reaction

1.3 Nutrition in organisms

1.3.1 How do the organisms obtain the food?

1.3.2 Cuctuta – Parasitic nutrition

1.4 Digestion in human beings

□ Process of movement of food through the alimentary canal

□ Litmus paper test □□ Enzyme □□ Flow chart of Human digestive system

1.5 Healthy points about oesophagus

1.6 Malnutrition – disease □□ Kwashiorkor □□ Marasmus □□ Obesity

1.6.1 Diseases due to vitamin deficiency

Biology

Respiration

- 2.1 Respiration – discovery of gases involved in respiration
 - 2.1.1 Different stages of respiration
 - 2.1.2 Expiration, inspiration
 - 2.1.3 Pathway of air
 - 2.1.4 Epiglottis – Pathway of air.
- 2.2 Respiratory system in human being
 - 2.2.1 Exchange of gases (alveoli to Blood capillaries)
 - 2.2.2 Mechanism of transport of gases
 - 2.2.3 Transport of gases (Capillaries to cells, cells to back)
- 2.3 Cellular respiration
 - 2.3.1 Anaerobic respiration
 - 2.3.2 Aerobic respiration
 - 2.3.3 Fermentation
- 2.4 Respiration – Combustion
 - Liberating heat during respiration
- 2.5 Evolution of gaseous exchange
- 2.6 Plant respiration
 - 2.6.1 Transportation of gases in plants
 - 2.6.2 Respiration through roots
 - 2.6.3 Photosynthesis – respiration

Transportation

- 3.1 Internal structure of Heart
 - 3.1.1 Blood vessels and blood transport
 - Blood capillaries Arteries veins
- 3.2 Cardiac cycle
 - 3.2.1 Single circulation, double circulation
- 3.3 Lymphatic system
- 3.4 Evolution of transport system
- 3.5 Blood pressure
- 3.6 Blood clotting

3.7 Transportation in plants

3.7.1 How water is absorbed

3.7.2 Root hair absorption

3.7.3 What is root pressure?

3.7.4 Mechanism of transportation of water in plants – Transportation, Root pressure, ascent of sap. Cohesive adhesive pressure

3.7.5 Transportation of Minerals

3.7.6 Transportation of food material

Excretion

4.1 Excretion in Human beings

4.2 Excretory system

4.2.1 Kidney

4.2.2 Kidney internal structure

4.3 Structure of Nephron

□ Malpighian tubules □ □ Nephron

4.4 Formation of urine

- Glomerular filtration
- Tubular reabsorption
- Tubular secretion
- Formation of hypertonic urine

4.4.1 Ureter

4.4.2 Urinary bladder

4.4.3 Urethra

4.4.4 Urine excretion

4.4.5 Urine composition

4.5 Dialysis – Artificial kidney

4.5.1 Kidney transportation

4.6 Accessory Excretory organs in human being (Lungs, skin, liver large intestine)

4.7 Excretion in other organisms

4.8 Excretion in plants

- 4.8.1 Alkaloids
- 4.8.2 Tannin
- 4.8.3 Resin
- 4.8.4 Gums
- 4.8.5 Latex
- 4.9 Excretion, Secretion

Control & coordination

- 5.1 Stimulus and response
- 5.2 Integrated system – Nerves coordination
- 5.3 Nerve cell structure
- 5.4 Pathways from stimulus to response
 - 5.4.1 Afferent nerves
 - 5.4.2 Efferent nerves
- 5.5 Reflex arc
 - 5.5.1 Reflex arc
- 5.6 Central nervous system
 - Brain □□Spinal nerves
- 5.7 Peripheral nervous system
- 5.8 Coordination without nerves
 - 5.8.1 Story of insulin
 - 5.8.2 Chemical coordination – endocrine glands
 - 5.8.3 Feedback mechanism
- 5.9 Autonomous nervous system
- 5.10 Coordination in plants – Phytohormones
 - 5.10.1 How plant shows responses to stimulus
 - 5.10.2 Tropic movements in plants

Reproduction

- 6.1 Growth of bacteria in milk.
- 6.2 Asexual reproduction
 - 6.2.1 fission, budding, fragmentation, parthenocarpy, parthenogenesis,

regeneration

6.2.2 Vegetative propagation

- Natural vegetative propagation through roots, stem, leaves
- Artificial propagation – cuttings, layering and grafting

6.2.3 Formation of spores

- Sporophyll

6.3 Sexual reproduction

Reproduction in human beings

6.3.1 Male reproductive system

6.3.2 Female reproductive system

6.3.3 Child birth

6.4 Sexual reproduction in plants

6.4.1 Flower – reproductive parts, unisexual, bisexual flowers, self and cross pollination.

6.4.2 Pollen grain

6.4.3 Structure of ovule, ovary; double fertilisation

6.4.4 Germination of seeds

6.5 Cell division – Cell cycle

6.5.1 Cell division in human beings

6.5.2 Cell cycle – G1, S, G2 and M phases

6.5.3 Mitosis

6.5.4 Meiosis

6.6 Reproductive health – HIV/ AIDS

6.6.1 Birth control methods

6.6.2 Fighting against social ills

6.6.3 Teenage motherhood, stop female foeticide

Coordination in Life Processes

7.1 Hunger

7.1.1 Effect of hunger stimulus

7.2 Relation between taste and smell

7.2.1 Relation between taste of tongue and palate

7.3 Mouth – a mastication machine

7.3.1 Action of Saliva on flour

7.3.2 Observing the pH of mouth

7.4 Passage of food through oesophagus

7.4.1 Peristaltic movement in oesophagus

7.5 Stomach is mixer

7.5.1 Movement of food from stomach to intestine.

7.5.2 Excretion of waste material

Heredity

8.1 New Characters – variation

8.2 Experiments conducted by Mendel (F1 generation, F2 generation), Mendel's Laws

8.2.1 F1 generation self pollination

8.2.2 Phenotype

8.2.3 Genotype

8.3 Parents to offsprings

8.3.1 How the characters exhibit?

8.3.2 Sex determination in human beings

8.4 Evolution

8.4.1 Genetic drift

8.5 Theories of organic evolution

8.5.1 Lamarckism

8.5.2 Darwinism

8.5.3 Darwin theory in a nutshell

8.6 Origin of species

8.6.1 How the new species originates

8.7 Evolution – Evidences

8.7.1 Homologous organs – analogous organs

8.7.2 Embryological Evidence

8.7.3 Fossils Evidences

8.8 Human Evolution

8.8.1 Human Beings: Museum of vestigial organs

Our Environment

9.1 Ecosystem – Food chain

9.1.1 Number Pyramid

9.1.2 Biomass Pyramid

9.1.3 Energy pyramid

9.2 Human activities – Their effect on ecosystem

9.2.1 Story of Kolleru lake

9.2.2 Edulabad reservoir – Effect of heavy metals

9.2.3 Sparrow campaign

9.3 Biological pest control measures

- Crop rotation
- Knowing the history of pests
- Sterility
- Gene mutation
- Concern towards environment

Natural resources

10.1 Case study – Agricultural land (past and present)

10.2 Case study – Water management

- Community based particing
- Farmer based intervention
- Waste land cultivation

10.3 Water resources in the Telugu States

10.4 Natural resources around us

10.5 Forest Renewable resources

10.5.1 Soil

10.5.2 Biodiversity

10.6 Fossil fuels

10.6.1 Minerals

10.7 Conservation, Redue, Reuse, Recycle, Recover

10.7.1 Conservation groups

