

# PHYSICAL SCIENCE - SYLLABUS

## 8th CLASS

### 1. Force

#### 1.1 What is force ?

##### 1.1.1 Identifying push or pull through different actions

#### 1.2 Types of forces

##### 1.2.1 Contact forces

###### 1.2.1.1 Muscular Force

- Preparing a list of instances where muscular force is used.
- Observing the muscle while working

###### 1.2.1.2 Force of Friction (Frictional force)

- Observing the motion of a ball on different surfaces
- Observing the motion of objects on an inclined plane

###### 1.2.1.3 Normal Force

###### 1.2.1.4 Tension

Lab Activity : To find the limiting force that can be borne by a string

##### 1.2.2 Forces acting at a distance (Field Forces)

###### 1.2.2.1 Magnetic Force

- Observing the magnetic force

###### 1.2.2.2 Electrostatic Force

- Observing electrostatic force

##### 1.2.2.3 Gravitational Force

- Explaining the force acting at a distance :  
Concept of field
- Visualizing magnetic field

#### 1.3 Net force

- Effects of net force acting on a table
- Effects of stretched rubber bands on fingers

##### 1.3.1 Calculating Net force from Free Body Diagrams (FBD)

#### 1.4 Effect of force on change of the state of motion of an object and its direction

##### 1.4.1 Effects of net force on direction of moving object

##### 1.4.2 Effects of force on the shape of an object

#### 1.5 Pressure

- Change in effect of force with area of contact
- What is pressure ?
- Identifying effects of force

### 2. Friction

#### 2.1 Force of friction - Types

- Identifying forces acting on a body and the effect of frictional force.

##### 2.1.1 To understand the nature of friction and the concept of static friction

- Definitions of friction, sliding friction, static friction
- Observing the variations in frictional force

- 2.2 Factors affecting friction
  - 2.2.1 Effect of rough surface on frictional force
  - 2.2.2 Effect of area of contact on frictional force
  - 2.2.3 Effect of Normal force on friction
- 2.3 Is friction necessary ?
  - 2.3.1 Friction produces heat
- 2.4 Increasing the decreasing friction
  - 2.4.1 How to reduce friction ?
  - 2.4.2 Effect of rollers on friction
  - 2.4.3 Understanding the principle of ball bearings
- 2.5 Fluid friction
  - Observing fluid friction
  - 2.5.1 Identifying factors influencing the fluid friction

### 3. Synthetic Fibres and Plastics

- 3.1 Clothes made from Natural fibres
- 3.2 What is synthetic fibre ?
  - 3.2.1 Concepts of monomer and polymer
- 3.3 Identifying synthetic fibres
  - 3.3.1 identifying synthetic fibres by burning test
- 3.4 Some of the synthetic fibres / examples for synthetic fibres
  - 3.4.1 Nylon
    - How is nylon made ?
    - How strong is nylon ?
  - 3.4.2 Rayon
    - How is rayon prepared ?
    - Why are different synthetic fibres mixed ?

- 3.4.3 Acrylic
- 3.4.4 Why synthetic fibres ?
- 3.4.5 Polyesters
  - How can you say a bottle is PET bottle ?
  - Identification of various articles with recycling codes
- 3.5 Plastics around us
  - 3.5.1 What is a plastic ?
  - 3.5.2 Types of plastics
    - Identifying thermoplastic and thermo setting plastic by flame test.
    - 3.5.2.1 Thermoplastics
    - 3.5.2.2 Thermo setting plastics
  - 3.5.3 Why do we prefer plastics ?
  - 3.5.4 Plastics and Environment
- 3.6 Bio degradable and non-bio degradable substances
- 3.7 Principle of 4R (Reduce, Recycle, Reuse and Recover)
  - 3.7.1 Reduce
  - 3.7.2 Reuse
  - 3.7.3 Recycle
    - Recycling code
    - Role of codes in Recycling process
    - Uncoded plastics
  - 3.7.4 Recover

#### 4. Metals and Non metals

- 4.1 Metals and non metals - an introduction
- 4.2 Physical properties of metals and non metals
  - 4.2.1 Appearance - Lustrous nature
    - Observing appearance and colour of materials
  - 4.2.2 Sonarity
    - Listening sound produced by some materials
  - 4.2.3 Malleability
    - Identifying malleability of material
  - 4.2.4 Ductility
  - 4.2.5 Electrical conductivity
    - Identifying electrical conductivity of a material
  - 4.2.6 Conductivity of Heat
    - Observing conductivity of heat of metals
- 4.3 Chemical properties of metals and non metals
  - 4.3.1 Reaction with oxygen
    - Rusting of metals
  - 4.3.2 Reaction with water
  - 4.3.3 Reaction with acids
- 4.4 Reactivity of metals
- 4.5 Some uses of non metals
- 4.6 Some uses of metals

#### 5. Sound

- 5.1 Production of sound
  - listening sound and predicting source
  - identifying different sounds

- 5.1.1 Vibrating bodies produce sound
  - Observing sound produced by a vibrating body
- 5.2 Sound has energy
- 5.3 Musical instruments
  - producing sounds that resembles sound of rainfall
  - observing changes in sound
- 5.4 Sounds produced by human
  - 5.4.1 Structure of voice box
    - Observing movements of vocal cords during speech
- 5.5 Sound propagation
  - 5.5.1 Sound needs medium to propagate
  - 5.5.2 Propagation of sound in different media
    - Observing sound propagation in Solids
    - Observing sound propagation in liquids
  - 5.5.3 Is sound propagate without medium
- 5.6 How do we hear sound
  - 5.6.1 Structure and function of eardrum
- 5.7 Characteristics of sound
  - 5.7.1 Loudness - Feebleness
    - Observing relationship between the intensity of sound produced and vibrations of a body
  - 5.7.2 Pitch
    - Identifying pitch or shrillness of a sound
- 5.8 Normal sound consists of mixed frequencies
- 5.9 Noise and music
- 5.10 Audible range

- 5.11 Sound pollution
  - 5.11.1 Effects of sound pollution
  - 5.11.2 Controlling measures

## 6. Reflection of Light at plane surfaces

- 6.1 Formation of image by a Pin hole camera
- 6.2 Fermat principle
- 6.3 Plane mirror
- 6.4 Reflection – its laws
  - 6.4.1 Plane of reflection
- 6.5 Plane mirrors – image formation
  - 6.5.1 Characteristics of an image formed by a plane mirror

## 7. Coal and Petroleum

- 7.1 Sources of materials
- 7.2 Exhaustible and inexhaustible resources
- 7.3 Fuels - Coal, Petroleum, Natural Gas
  - 7.3.1 Production of petroleum
  - 7.3.2 Natural gas is an important source
  - 7.3.3 Uses of coal, petroleum, natural gas
  - 7.3.4 various uses of petroleum
  - 7.3.5 Coal and its products
    - Coke
    - Coal gas
    - Coaltar
  - 7.3.6 Uses of coal products
    - Observing gases evolved in burning of coal
- 7.4 Some petrochemical products
- 7.5 Natural gas and petrochemicals
- 7.6 Formation of coal, petroleum
- 7.7 Versatile nature of coal and petroleum

- 7.8 Conserving coal and petroleum
- 7.9 Misuse of energy resources
  - 7.9.1 Harmful effects of fuels

## 8. Combustion, Fuels and flame

- 8.1 Do all materials burn ?
- 8.2 What is required for the process of combustion ?
  - 8.2.1 Testing of necessity of air for burning
  - 8.2.2 Oxygen helps in burning
- 8.3 Ignition temperature
  - 8.3.1 Burning paper with sun rays
  - 8.3.2 Understanding ignition temperature
- 8.4 Types of Combustion
- 8.5 Fuels
- 8.6 Fire controll
- 8.7 Flame
  - 8.7.1 Observing behaviour of different solid fuels
  - 8.7.2 Structure of flame
  - 8.7.3 Observing situations, happens in different zones of candle flame

## 9. Electrical Conductivity of Liquids

- 9.1 Testing the material to know which allows electric current to pass through it.
- 9.2 Electrical conductivity of liquids
  - 9.2.1 Testing the electrical conductivity of liquids
  - 9.2.2 When do liquids conduct electricity - electric conductivity of electrolyte.
- 9.3 Chemical effects of electric current
  - Testing the effect of electric current on potato.

- 9.4 Electrolytic cell
  - 9.4.1 Making of an electric cell
- 9.5 Electroplating
  - 9.5.1 Electroplating procedure
  - 9.5.2 Uses of electroplating

## 10. Some natural phenomena

- 10.1 Lightning
  - 10.1.1 Sparks - that the greeks know about
- 10.2 Charging by rubbing
  - 10.2.1 Effects of rubbing
  - 10.2.2 Effects of charged bodies
- 10.3 Types of charges and their interaction
  - 10.3.1 Finding the presence of charge on a body
  - 10.3.2 Transfer of charge
- 10.4 Story of Lightning - Safety measures
  - 10.4.1 Lightning conductor
- 10.5 Earthquakes
  - 10.5.1 Collecting information about earthquake damages
  - 10.5.2 What is earthquake
  - 10.5.3 Causes of earthquake
  - 10.5.4 Earthquakes - safety measures
  - 10.5.5 Earthquakes in Telangana

## 11. Stars and the Solar system

- 11.1 Observing changes in length of shadow
- 11.2 Understanding the North - South movement of Sun
- 11.3 Sun-dail
- 11.4 Phases of moon

- 11.4.1 Why moon shape changed
- 11.4.2 Moon surface
- 11.5 Solar eclipse
  - 11.5.1 Types of Solar eclipse
- 11.6 Lunar eclipse
  - 11.6.1 Types of lunar eclipse
- 11.7 Know about stars
  - 11.7.1 Observing movements of constellation
  - 11.7.2 Why polar star appears fixed at a point
- 11.8 The Solar System
  - 11.8.1 Sun
  - 11.8.2 The Planets
  - 11.8.3 Some other members of Solar system
    - Asteroids
    - Comets
    - Meteors and Meteorites
- 11.9 Artificial Satellites
- 11.10 How people know earth is spherical
  - 11.10.1 How people know earth rotates on its own axis

## 12. Graphs of Motion

- 12.1 Motion, Graphs - Introduction
- 12.2 Graph is not a map
- 12.3 Graphs of uniform motion
  - 12.3.1 Slope of Graph - Velocity
  - 12.3.2 Graphs of Stationary Objects
- 12.4 Graphs of non-uniform motion