

CLASS 8

Physics & Chemistry — Complete Formula Handbook

Contents

PHYSICS

1. Force and Pressure
2. Friction
3. Sound
4. Chemical Effects of Electric Current
5. Some Natural Phenomena
6. Light
7. Stars and the Solar System

CHEMISTRY

1. Crop Production and Management
2. Microorganisms: Friend and Foe
3. Synthetic Fibres and Plastics
4. Materials: Metals and Non-Metals
5. Coal and Petroleum
6. Combustion and Flame
7. Conservation of Plants and Animals

PHYSICS

Force and Pressure

Force	Push or pull acting on an object
Pressure	$P = \text{Force} / \text{Area}$
SI unit of pressure	Pascal (Pa) = N/m^2
Types of force	Muscular, Frictional, Gravitational, Magnetic, Electrostatic

Friction

Friction	Force that opposes relative motion between two surfaces in contact
Types of friction	Static, Sliding, Rolling
Friction and surface	Friction increases with roughness of surface

Sound

Sound production	Produced by vibration of objects
Frequency	Number of oscillations per second; Unit: Hertz (Hz)
Time period	$T = 1 / \text{Frequency}$
Amplitude	Maximum displacement from mean position (relates to loudness)
Audible range (humans)	20 Hz to 20,000 Hz

Chemical Effects of Electric Current

Electroplating	Depositing a layer of metal on another material using electric current
Good/poor conductors	Some liquids conduct electricity (electrolytes); pure water is a poor conductor

Some Natural Phenomena

Lightning	Discharge of accumulated electric charge between clouds/cloud and ground
Earthquake magnitude	Measured on the Richter scale using a seismograph

Light

Laws of reflection	Angle of incidence = Angle of reflection; incident ray, reflected ray, normal lie in the same plane
Regular vs diffused reflection	Smooth surface → regular; rough surface → diffused

Stars and the Solar System

Solar system order	Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
Celestial bodies	Stars, Planets, Satellites, Comets, Asteroids, Meteors/Meteorites

CHEMISTRY

Crop Production and Management

Agricultural practices	Preparation of soil → Sowing → Manuring → Irrigation → Weeding → Harvesting → Storage
Manure vs Fertiliser	Manure: organic, less nutrient-rich; Fertiliser: chemical, nutrient-rich

Microorganisms: Friend and Foe

Types of microorganisms	Bacteria, Fungi, Protozoa, Algae, Viruses
Fermentation	Conversion of sugar into alcohol using yeast (anaerobic process)
Nitrogen fixation	Rhizobium bacteria convert atmospheric N ₂ into usable nitrogen compounds

Synthetic Fibres and Plastics

Types of synthetic fibres	Rayon, Nylon, Polyester, Acrylic
Thermoplastics vs Thermosetting	Thermoplastics: reshaped on heating; Thermosetting: cannot be reshaped once set

Materials: Metals and Non-Metals

Properties of metals	Malleable, Ductile, Sonorous, Good conductors, Lustrous
Properties of non-metals	Brittle (in solid form), Poor conductors, Non-lustrous (except iodine, graphite)
Reaction with oxygen	Metal + O ₂ → Metal oxide (basic); Non-metal + O ₂ → Non-metal oxide (acidic)

Coal and Petroleum

Fossil fuels	Coal, Petroleum, Natural gas — formed from dead remains over millions of years
Fractional distillation products	Petroleum gas, Petrol, Diesel, Kerosene, Lubricating oil, Paraffin wax

Combustion and Flame

Combustion	Chemical process in which a substance reacts with oxygen to give heat and light
Ignition temperature	Lowest temperature at which a substance catches fire
Types of combustion	Rapid, Spontaneous, Explosion
Fuel efficiency	Calorific value — measured in kilojoule per kg (kJ/kg)

Conservation of Plants and Animals

Key terms	Biosphere Reserve, Wildlife Sanctuary, National Park, Endangered species, Red Data Book
-----------	---