- SS1 Chemistry Lesson Note
- Week 1: Introduction to Chemistry I
- 1. What is Chemistry? (Meaning and Scope)

Definition:

Chemistry is the branch of science that studies the structure, composition, properties, and reactions of matter, especially at the atomic and molecular levels.

It deals with:

- What substances are made of.
- How substances behave.
- How substances change during chemical reactions.
- How energy is involved in these changes.

Example: When you mix vinegar and baking soda and it fizzes, that's chemistry at work—a chemical reaction producing a gas (carbon dioxide).

Scope of Chemistry:

Chemistry explains:

- Why water boils at 100°C.
- Why iron rusts.
- How plants make their food.
- How drugs affect the body.
- Why plastics and fuels are made from crude oil.
- 2. Branches of Chemistry (Detailed)

Branch Description Real-Life Example

Organic Chemistry Study of carbon-containing compounds. Making drugs, fuels, plastics

Branch	Description	Real-Life Example
Inorganic Chemistry	Study of non-carbon elements and compounds.	Making salts, metals, ceramics
Physical Chemistry	Deals with energy, rates of reactions, and states of matter.	Understanding how batteries work
Analytical Chemistry	Identifying and measuring substances.	Testing blood for sugar levels
Biochemistry	Study of chemical processes in living things.	DNA, enzymes, digestion
Industrial Chemistry	Application of chemistry in industries.	Producing fertilizers, cosmetics

Note: All these branches are interconnected and often overlap in practical fields.

3. Career Prospects in Chemistry

Chemistry provides many career paths. Some include:

- **Pharmacist** Uses chemistry to prepare and dispense medicines.
- Doctor / Nurse Needs chemistry knowledge for understanding the human body and drugs.
- Chemical Engineer Designs and runs plants that make chemicals, fuels, plastics, etc.
- Lab Technician Performs chemical analysis in industries and hospitals.
- Lecturer / Chemistry Teacher Teaches chemistry at various levels.
- **Environmental Scientist** Solves pollution and waste disposal issues.
- **Petroleum Engineer** Explores and processes crude oil into fuels and gases.
- Cosmetic Chemist Develops skin care products, perfumes, and makeup.
- **Forensic Scientist** Uses chemical techniques to solve crimes.
- **Food Scientist** Ensures food safety, develops preservation techniques.

Sclassroom activity idea: Ask students to mention any family member or role model whose job involves chemistry.

• 4. Applications of Chemistry in Everyday Life

Chemistry is everywhere. It is involved in:

Health and Medicine

- Drug development (e.g., antibiotics, pain relievers)
- Sterilization of tools
- Cancer and disease treatment (e.g., chemotherapy)

Agriculture

- Production of fertilizers, pesticides, and herbicides
- Food preservation (e.g., canning, freezing, chemical preservatives)

Industry

- Refining crude oil to produce petrol, diesel, kerosene
- Manufacturing plastics, glass, soaps, paints, fabrics

Environment

- Pollution control
- Recycling processes
- Waste treatment

Military

• Explosives, defense gases, protective gear

Space and Aviation

- Rocket fuels
- Lightweight materials for space travel

Food and Cosmetics

- Food additives and colorings
- Preservatives, flavors, and perfumes

• Skincare products and soaps

Examples for Deeper Understanding

Sector	Chemical Contribution	Example
Hospital	Disinfectants and medicine	Paracetamol, Dettol
Petrochemical Industry	Processing crude oil	Petrol, LPG
Kitchen	Reactions in cooking	Baking (yeast fermentation), vinegar
Bathroom	Chemistry of soaps and shampoos Saponification process	
Farming	Boosting yields	NPK fertilizers, urea