CLASS 6 SCIENCE COMPREHENSIVE NOTES

Unit 1: Food & Its Essential Components

Mastering Food Sources, Nutrients, Balanced Diets, and Deficiency Diseases

1. Where Does Our Food Come From?

Every living organism needs food to live, grow, stay healthy, and get energy for daily activities. Humans obtain food from two primary natural sources: **Plants** and **Animals**.

- **Plant Sources:** We eat various parts of plants such as roots (carrot, radish), stems (potato, sugarcane), leaves (spinach, cabbage), flowers (cauliflower), seeds (wheat, rice, pulses), and fruits (apple, mango).
- **Animal Sources:** Animals provide us with milk, eggs, meat, honey, and fish. Animals like cows and goats are called milk-yielding animals (milch animals).

Did You Know? Honey Production!
Honey bees collect sweet juice called **nectar** from flowers, convert it into honey, and store it in their hives. Honey contains natural sugars, water, minerals, and enzymes!

2. What are the Nutrients in Food?

Food contains chemical substances that our body needs to survive and function properly. These substances are called **nutrients**. There are five main nutrient groups, plus dietary fibers and water.

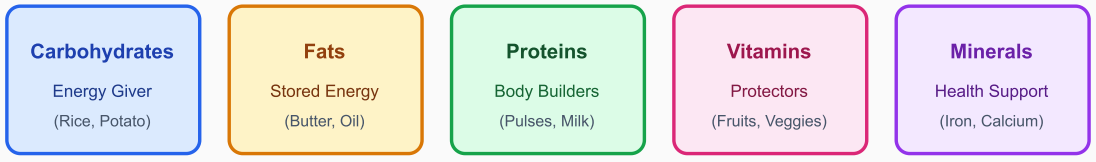

Figure 1.1: The 5 major nutrient groups required by the human body for growth and health.

3. Detailed Functions of Essential Nutrients

Each nutrient performs specific tasks inside our body. Eating a variety of foods ensures we get all of them in adequate amounts.

Nutrient Group	Main Function in Body	Rich Food Sources
Carbohydrates	Provide instant energy for work and play. Mainly present as starch and sugars.	Rice, wheat, maize, potato, banana, sugar.
Fats	Provide double the energy of carbohydrates and keep the body warm.	Ghee, butter, mustard oil, nuts, meat.
Proteins	Help in growth, body-building, and repairing damaged tissues/cells.	Pulses (dal), milk, eggs, paneer, fish, beans.
Vitamin A	Keeps eyes and skin healthy; improves night vision.	Carrot, papaya, milk, spinach, fish oil.
Vitamin C	Helps body fight infections and diseases; keeps gums healthy.	Amla, lemon, orange, guava, tomato.
Vitamin D	Helps body absorb calcium for strong bones and teeth.	Sunlight, milk, butter, eggs, fish.
Calcium (Mineral)	Builds strong bones and teeth; helps in blood clotting.	Milk, cheese, green leafy vegetables.
Iron (Mineral)	Required to form hemoglobin in blood that carries oxygen.	Spinach, apples, jaggery, liver, dates.

4. Dietary Fiber (Roughage) & Water

Why do we need Roughage and Water?

Dietary Fiber (Roughage): It does not provide any nutrient to our body, but it is an essential part of our food. It adds bulk to food and helps our body get rid of undigested food easily, preventing constipation. *Sources: Whole grains, fresh fruits, vegetables.*

Water: Helps our body absorb nutrients from food and eliminates body wastes as urine and sweat. We should drink 2–3 liters of clean water daily.

5. Balanced Diet & Deficiency Diseases

A diet that contains all the essential nutrients (carbohydrates, fats, proteins, vitamins, minerals) along with adequate roughage and water in the right proportions is called a **Balanced Diet**.

If a person does not get enough of a particular nutrient over a long period, they may suffer from a **Deficiency Disease**.

Deficient Nutrient	Name of Disease	Key Symptoms & Signs
Vitamin A	Loss of Vision / Night Blindness	Poor vision, inability to see in dim light/night.
Vitamin B1	Beriberi	Weak muscles and very little energy to work.
Vitamin C	Scurvy	Bleeding gums, wounds take longer time to heal.
Vitamin D	Rickets	Bones become soft, weak, and bent (bow-legs).
Calcium	Bone and Tooth Decay	Weak bones, tooth decay, brittle nails.
Iodine	Goitre	Swollen gland in the neck, mental disability in children.
Iron	Anaemia	General weakness, pale skin, fatigue, low energy.

6. Quick Concept Checkpoint (No-Doubt Review)

Q: Why is cooked food good for us?
Cooking makes food soft, tasty, and easy to digest. It also kills harmful germs present in raw food.

Q: What is Starch Test (Iodine Test)?
Add 2-3 drops of dilute Iodine solution to food. If color turns **Blue-Black**, starch is present!

Q: How to test for Fats?
Rub food on a piece of paper. An **oily, translucent patch** shows the presence of fat.

Q: How to test for Proteins?
Add Copper Sulfate + Caustic Soda to mashed food. A **Violet color** confirms protein!

UNIT 2: MATTER & MATERIALS

Sorting Materials into Groups & Separation Techniques

Properties of Matter, States of Matter, and Methods of Separating Substances

1. Why Do We Group Materials?

Look around you—everything you see is made of materials! Placing similar objects together based on shared properties is called **Classification**. Grouping helps us study their properties easily and understand patterns.

2. Physical Properties of Materials

- **Appearance & Lustre:** Materials that shine are called lustrous (e.g., Gold, Copper, Aluminum). Non-shiny materials are non-lustrous (e.g., Wood, Plastic).
- **Hardness:** Materials that can be easily compressed or scratched are *Soft* (e.g., Cotton, Sponge). Materials that are difficult to compress are *Hard* (e.g., Iron, Stone).
- **Solubility in Water:** Substances that dissolve completely in water are **Soluble** (e.g., Salt, Sugar). Substances that do not dissolve are **Insoluble** (e.g., Sand, Sawdust).

3. Event Diagram: Transparency Classification

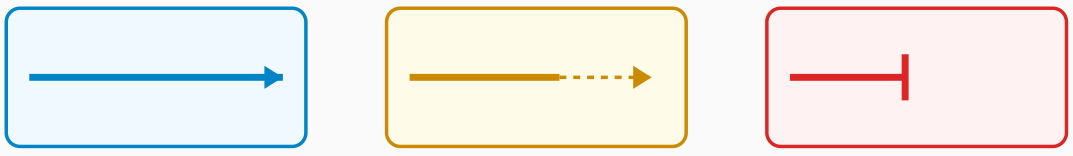

Figure 2.1: Light transmission behavior through Transparent, Translucent, and Opaque objects.

4. Separation of Substances (Methods & Principles)

In daily life, we often need to separate useful substances from mixtures or remove harmful impurities. Different physical methods are used depending on particle size, weight, and solubility.

- **Handpicking:** Used when unwanted particles differ in size, shape, or color and are present in small quantities (e.g., removing stones from rice).
- **Threshing:** Process of beating harvested stalks to free grain seeds (done manually or using bullocks/machines).
- **Winnowing:** Used to separate heavier grain seeds from lighter husk particles using wind or blowing air.
- **Sieving:** Used when components of a mixture have different sizes; smaller particles pass through sieve holes while larger ones remain behind.

5. Event Diagram: Sedimentation, Decantation & Filtration

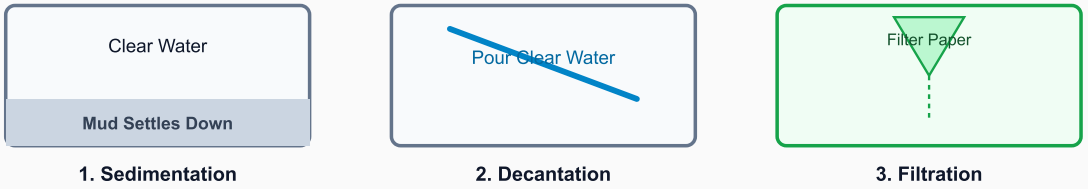

Figure 2.2: Three-step process for separating insoluble mud/sand impurities from liquid water.

6. Advanced Separation Concepts

Evaporation, Condensation & Saturated Solutions

Evaporation: Process of converting liquid into gas/vapor on heating. Used to obtain pure salt from seawater.

Condensation: Process of converting water vapor back into liquid on cooling (e.g., water droplets forming on cold glass).

Saturated Solution: A solution in which no more solute (like sugar/salt) can be dissolved at a given temperature.

UNIT 3: LIVING ORGANISMS

Plants, Habitats & Key Revisions

Plant Structure, Adaptation Characteristics, and Master Doubt-Clearing Summary

1. Anatomy of a Flowering Plant

A plant is broadly divided into two organ systems:

- **Root System (Underground):** Absorbs water and minerals from soil, anchors plant firmly. *Taproots* have one main primary root (e.g., Mustard, Carrot), while *Fibrous roots* have a cluster of thin roots (e.g., Grass, Wheat).
- **Shoot System (Above Ground):** Includes Stem (transports water/food), Leaves (photosynthesis), Flowers (reproduction), and Fruits.

2. Photosynthesis & Leaf Venation

Leaves are called the **food factories** of plants. They prepare food using water, carbon dioxide, sunlight, and green pigment called **Chlorophyll**. The arrangement of veins in a leaf is called **Venation** (Reticulate = net-like, Parallel = straight lines).

3. Class 6 Master Doubt-Clearing Summary

Q: What is Transpiration?
Loss of water in the form of water vapor through tiny pores (stomata) on leaves. Keeps plant cool!

Q: Taproot vs. Fibrous Root link?
Plants with **Reticulate venation** have Taproots! Plants with **Parallel venation** have Fibrous roots!

Q: What is Adaptation?
Special traits/features that help plants and animals survive in their specific natural surroundings (habitat).

Q: Reversible vs. Irreversible Changes?
Reversible can be undone (melting ice). Irreversible cannot be undone (baking bread, burning paper).