Nutrition

- **Nutrients** are constituents of our food which are essential for the body. They serve as fuel and are oxidised to generate energy which is essential to carry out different life processes.
- **Nutrition** is the supply of essential organic and inorganic chemical compounds such as proteins, carbohydrates, minerals, vitamins etc. to the body.
- Nutrition is needed for the growth, repair, energy, maintenance and protection of the body.
- **Classes of nutrients**

Nutrient	Sources	Function	Nutritional disorder
Carbohydrates	Cereals such as wheat, rice, maize potatoes, sugar, honey, banana, melon, papaya etc.	Mainly provide energy.	Deficiency-Weakness and retardation of growth. Excess-Obesity.
Fats	Butter, ghee, milk, cheese, oil, egg yolk, meat etc.	Provides twice as much energy as that provided by the same amount of carbohydrates.	Deficiency-Phrynoderma. Excess-Atherosclerosis.
Proteins	Milk, pulses, peas, beans, chicken, fish, eggs, cheese etc.	Needed for growth and repair of the body.	Deficiency-Kwashiorkor and marasmus.
Dietary fibres/Roughage	Plant products, whole grains, pulses, fresh fruits and vegetables.	Essential as they add to the bulk of the food and help to eliminate the undigested food.	Difficulty in formation of stools.
Water	Besides liquid water, many food items contain water such as tomatoes, melons, cabbage lettuce, etc.	Helps to absorb nutrients from food, transportation and regulation within the body, throwing out wastes from body as urine and sweat.	Impairment in bodily functions.

- **Minerals** are compounds found in nature which are required for various reactions taking place in the body.

- **Some important mineral elements**

ELEMENT	RICH SOURCES	CHIEF FUNCTIONS	DEFICIENCY DISEASES
Macronutrients (needed in large quantity)			
Calcium	Dairy foods, beans, cabbage	Constituent of bone and enamel, required for muscle contraction, clotting of blood	Rickets, poor skeletal growth
Sodium	Table salt	Regulates acid base equilibrium	Muscular cramps
Potassium	Banana, potato, citrus fruits	Nerve and muscle activity, fluid balance, secretion of acetylcholine	Nerve impulses do not get transmitted
Phosphorus in phosphate	Dairy products, cereals, beans, nuts, meat, egg	Synthesis of nucleic acid, ATP, NADP, bones and enamel, muscle contraction, conduction of nerve impulses	Soft bone
Magnesium	Vegetables, whole grain, nuts, sea food, meat	Bone and tooth structure, synthesis of enzymes	Increased irritability of nervous system
Sulphur in sulphate	Dairy products, onion, garlic, radish, meat, egg	Component of protein and co-enzymes	Skin problems
Chlorine	Table salt	Water balance, secretion of HCl in gastric juice	Muscular cramps
Micronutrients (needed in small quantity)			
Iron	Whole cereals, fish, nut, egg yolk, liver, kidney	Synthesis of haemoglobin associated with oxidation-reduction reactions	Anaemia
Cobalt	Milk, cereals, pulses, liver, red meat	Development of red blood cells, component of vitamin B_{12}	Pernicious anaemia
Copper	Nuts, legumes, liver, kidney	Production of melanin, cell oxidation, synthesis of enzymes	Loss of body weight, anaemia
Zinc	Cereals, pulses, nuts, meat, liver oil	Needed for synthesis of enzymes, carbon dioxide transport in blood	Retarded growth, skin lesions, albinism
Iodine	Iodised salt, water, sea foods	Component of thyroxin hormone secreted by thyroid gland	Goitre, cretinism in children
Fluorine	Water, milk	Component of tooth enamel and bone	Dental decay
Manganese	Vegetables	Bone development, nitrogen metabolism	Poor bone development
Molybdenum	Pulses, cereals, meat	Nitrate assimilation	Slight retardation of growth

- **Vitamins** are organic substances required by the body in small quantities to maintain good health.
- **Some Important Vitamins**

ELEMENT	RICH SOURCES	CHIEF FUNCTIONS	DEFICIENCY DISEASES
Fat-soluble vitamins			
A (Retinol)	Butter, egg yolk, liver, milk, carrots, leafy green vegetables, yellow fruit, fish liver oils	Promotes growth, resists infection of the skin and mucous membrane, component of visual purple in the retinal cells of the eye for perception of image	Night blindness, Xerophthalmia
D (Calciferol)	Fish liver oils, milk, eggs Produced in the skin by exposure to sunlight	Helps the body to use calcium and phosphorus to form the bones and teeth	Rickets in children, osteomalacia in adults
E (Tocopherol)	Meat, milk, whole wheat	Prevents oxidation of vitamin A	Sterility in rats
K (Phylloquinone)	Green leafy vegetables, especially cabbage and spinach	Needed in normal clotting of the blood	Haemorrhage
Water-soluble vitamins			
B1 (Thiamine)	Whole grains, yeast, liver, eggs and lean meat	Increases growth and appetite, helps in digestion and functioning of the nervous system	Beriberi
B2 (Riboflavin)	Eggs, liver, milk, yeast, green vegetables	Regulates oxidation of food	Irritation in eyes and skin, intestinal disorders, inflammation of the tongue
B3 (Niacin)	Lean meat, liver, milk, eggs, groundnuts, whole grains	Promotes health of the skin and the nervous system	Pellagra, dermatitis, loss of memory, diarrhoea, skin lesions, rashes
B5 (Pantothenic acid)	Mushrooms, sweet potato, lentils etc.	Breakdown of fats and carbohydrates, production of red blood cells	Fatigue, loss of coordination
B6 (Pyridoxine)	Meat, fish, eggs, cereal bran	Inter-conversion of amino acids	Skin problems, nerve disorders
B11 (Folic acid)	Liver, leafy vegetables	Synthesis of haemoglobin	Anaemia
B12 (Cobalamine)	Liver, meat, milk, cereals, pulses	Normal functioning of red blood cells	Pernicious anaemia

C (Ascorbic acid)	Fresh citrus fruit (lemon, orange, grape fruit), tomatoes, germinating seeds	Promotes functioning of capillary walls	Increases susceptibility to infections, scurvy

- A diet which contains all the principal constituents of food in proper quantity is called a **balanced diet**.
- **Malnutrition** is the condition in which a person suffers due to the lack or deficiency of one or more essential elements of food.