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## CHAPTER-1-MATTER IN OUR SURROUNDINGS

1. Everything in this universe is made up of material which scientists have named "matter" which occupy space and have mass.
2. Early Indian philosophers classified matter in the form of five basic elements – the "Panch Tatva" – air, earth, fire, sky and water.
3. Modern day scientists have evolved two types of classification of matter based on their physical properties and chemical nature.
4. The particles of matter are very small – they are small beyond our imagination.
5. Particles of matter have space between them.
6. Particles of Matter are Continuously Moving.
7. With increase in temperature the kinetic energy of the particles also increases.
8. Particles of matter intermix on their own with each other by getting into the spaces between the particles.
9. Intermixing of particles of two different types of matter on their own is called diffusion.
10. On heating, diffusion becomes faster.
11. Matter around us exists in three different states–

solid, liquid and gas.

12. These states of matter arise due to the variation in the characteristics of the particles of matter.

### The Solid State-

- have a tendency to maintain their shape when subjected to outside force.
- break under force but it is difficult to change their shape, so they are rigid.

### The Liquid State-

1. liquids have no fixed shape but have a fixed volume.
2. take up the shape of the container in which they are kept.
3. flow and change shape, so they are not rigid but can be called fluid.
4. solids, liquids and gases can diffuse into liquids.
5. The rate of diffusion of liquids is higher than that of solids.
6. This is due to the fact that in the liquid state, particles move freely and have greater space between each other as compared to particles in the solid state.

### The Gaseous State-

1. highly compressible as compared to solids and liquids.
2. Due to high speed of particles and large space between them, gases show the property of diffusing very fast into other gases.
3. On increasing the temperature of solids, the kinetic energy of the particles increases.
4. Due to the increase in kinetic energy, the particles start vibrating with greater speed.
5. The energy supplied by heat overcomes the forces of attraction between the particles.
6. The particles leave their fixed positions and start

moving more freely.

7. A stage is reached when the solid melts and is converted to a liquid.
8. The temperature at which a solid melts to become a liquid at the atmospheric pressure is called its melting point.
9. The melting point of a solid is an indication of the strength of the force of attraction between its particles.
10. The process of melting, that is, change of solid state into liquid state is also known as fusion. When a solid melts, its temperature remains the same.
11. The amount of heat energy that is required to change 1 kg of a solid into liquid at atmospheric pressure at its
12. melting point is known as the latent (HIDDEN) heat of fusion.
13. The temperature at which a liquid starts boiling at the atmospheric pressure is known as its boiling point.
14. Boiling is a bulk phenomenon.
15. A change of state directly from solid to gas without changing into liquid state (or vice versa) is called sublimation.
16. solid carbon dioxide ( $\text{CO}_2$ ) is stored under high pressure.
17. Solid  $\text{CO}_2$  gets converted directly to gaseous state on decrease of pressure to 1 atmosphere without coming
18. into liquid state. This is the reason that solid carbon dioxide is also known as dry ice.
19. Pressure and temperature determine the state of a substance, whether it will be solid, liquid or gas.
20. Change of a liquid into vapours at any temperature below its boiling point is called evaporation.
21. the rate of evaporation increases with an increase of surface area: evaporation is a surface phenomenon, an increase of temperature: ,
22. a decrease in humidity: , an increase in wind speed: Evaporation causes cooling.

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# NCERT GENERAL SCIENCE NOTES CLASS 7TH

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### SCIENCE-CLASS-VII

#### CHAPTER-1-NUTRITION IN PLANTS

1. Carbohydrates, proteins, fats, vitamins and minerals are components of food.
2. These components of food are necessary for our body and are called nutrients.
3. Nutrition is the mode of taking food by an organism and its utilisation by the body.
4. The mode of nutrition in which organisms make food themselves from simple substances is called autotrophic
5. (auto = self; trophos = nourishment) nutrition. plants are called autotrophs.
6. Animals and most other organisms take in readymade food prepared by the plants. They are called
7. heterotrophs (heteros =other).
8. the bodies of living organisms are made of tiny units called cells.
9. Cells can be seen only under the microscope.
10. Some organisms are made of only one cell.
11. The cell is enclosed by a thin outer boundary, called the cell membrane cell membrane.
12. Most cells have a distinct, centrally located spherical structure called the nucleus.
13. The nucleus is surrounded by a jelly-like substance called cytoplasm.
14. Carbon dioxide from air is taken in through the tiny pores present on the surface of the leaves.
15. These pores are surrounded by 'guard cells'. Such pores are called stomata.
16. The leaves have a green pigment called chlorophyll. It helps leaves to capture the energy of the sunlight. This energy is used to synthesise (prepare) food from carbon

dioxide and water.

17. Since the synthesis of food occurs in the presence of sunlight, it is called photosynthesis (Photo: light; synthesis : to combine).
18. So we find that chlorophyll, sunlight, carbon dioxide and water are necessary to carry out the process of photosynthesis.
19. During photosynthesis, chlorophyll containing cells of leaves in the presence of sunlight, use carbon dioxide
20. and water to synthesize carbohydrates.
21. During the process oxygen is released.
22. The carbohydrates ultimately get converted into starch.
23. The presence of starch in leaves indicates the occurrence of photosynthesis.
24. The starch is also a carbohydrate. You often see slimy, green patches in ponds or in other stagnant water bodies.
25. These are generally formed by the growth of organisms called algae.
26. They contain chlorophyll which gives them the green colour.
27. Algae can also prepare their own food by photosynthesis.
28. The carbohydrates are made of carbon, hydrogen and oxygen.
29. These are used to synthesise other components of food.
30. proteins are nitrogenous substances which contain nitrogen.
31. Soil has certain bacteria that convert gaseous nitrogen into a usable form and release it into the soil.
32. These soluble forms are absorbed by the plants along with water.
33. Farmers adding fertilisers rich in nitrogen to the soil.
34. In this way the plants fulfill their requirements of nitrogen along with the other constituents.
35. Plants can then synthesise components of food other

than carbohydrates such as proteins and fats.

36. humans and animals such plants depend on the food produced by other plants.
37. They use the heterotrophic mode of nutrition.
38. Yellow tubular structures twining around the stem and branches of a tree? This is a plant called Cuscuta (Amarbel).
39. It does not have chlorophyll.
40. It takes readymade food from the plant
41. The plant on which it climbs is called a host.
42. Pitcher plant showing lid and pitcher
43. The apex of the leaf forms a lid which can open and close the mouth of the pitcher.
44. Inside the pitcher there are hairs which are directed downwards.
45. When an insect lands in the pitcher, the lid closes and the trapped insect gets entangled into the hair.
46. The insect is digested by the digestive juices secreted in the pitcher. Such insect-eating plants are called insectivorous plants

### SAPROTROPHS

1. cotton-like threads spread on the piece of bread
2. These organisms are called fungi.
3. They have a different mode of nutrition.
4. They secrete digestive juices on the dead and decaying matter and convert it into a solution.
5. Then they absorb the nutrients from it.
6. This mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter is
7. called saprotrophic nutrition saprotrophic nutrition.
8. Plants which use saprotrophic mode of nutrition are called saprotrophs
9. Fungi also grow on pickles, leather, clothes and other articles that are left in hot and humid weather for long



time

10. Some organisms live together and share shelter and nutrients. This is called symbiotic relationship. For example, certain fungi live in the roots of trees.
11. The tree provides nutrients to the fungus and, in return, receives help from it to take up water and nutrients from the soil.
12. This association is very important for the tree.
13. In organisms called lichens, a chlorophyll-containing partner, which is an alga, and a fungus live together.
14. The bacterium called Rhizobium can take atmospheric nitrogen and convert it into a soluble form.
15. But Rhizobium cannot make its own food.
16. So it lives in the roots of gram, peas, moong beans and other legumes and provides them with nitrogen.
17. Most of the pulses (dals) are obtained from leguminous plants.

## CHAPTER-2-NUTRITION IN ANIMALS

1. Animal nutrition includes nutrient requirement, mode of intake of food and its utilisation in the body.
2. The components of food such as carbohydrates are complex substances.
3. These complex substances cannot be utilised as such.
4. So they are broken down into simpler substances.
5. The breakdown of complex components of food into simpler substances is called digestion.
6. Starfish feeds on animals covered by hard shells of calcium carbonate.

## DIGESTION IN HUMANS

1. The food passes through a continuous canal which begins at the buccal cavity and ends at the anus. The canal can be divided into various compartments:(1) the buccal cavity, (2) food pipe oesophagus, (3)stomach, (4) small

intestine , (5) large intestine ending in the rectum rectum and (6) the anus. These parts together form the alimentary canal alimentary canal (digestive tract) .

2. The digestive tract and the associated glands together constitute the digestive system.
3. The saliva breaks down the starch into sugars.
4. The swallowed food passes into the food pipe or oesophagus.
5. The stomach-widest part of the alimentary canal
6. The inner lining of the stomach secretes mucous, hydrochloric acid and digestive juices.
7. The mucous protects the lining of the stomach.
8. The acid kills many bacteria that enter along with the food and makes the medium in the stomach acidic.
9. The digestive juices break down the proteins into simpler substances
10. The small intestine-The small intestine is highly coiled and is about 7.5 metres long.
11. It receives secretions from the liver and the pancreas. Besides, its wall also secretes juices.
12. The liver is a reddish brown gland situated in the upper part of the abdomen on the right side.
13. It is the largest gland in the body.
14. It secretes bile juice that is stored in a sac called the gall bladder gall bladder.
15. The bile plays an important role in the digestion of fats.
16. The pancreas is a large cream coloured gland located just below the stomach.
17. The pancreatic juice acts on carbohydrates and proteins and changes them into simpler forms.
18. The digested food can now pass into the blood vessels in the wall of the intestine. This process is called absorption.
19. The inner walls of the small intestine have thousands of finger-like outgrowths. These are called villi (singular villus).

20. Large intestine is wider and shorter than small intestine. about 1.5 metre in length. Its function is to absorb water and some salts from the undigested food material.
21. The remaining waste passes into the rectum and remains there as semi-solid faeces.
22. The faecal matter is removed through the anus from time-to-time. This is called egestion.

## DIGESTION IN GRASS-EATING ANIMALS

- Actually, they quickly swallow the grass and store it in a separate part of the stomach called rumen.

## Diarrhoea

1. Sometime you may have experienced the need to pass watery stool frequently. This condition is known as diarrhoea. caused by an infection, food poisoning or indigestion.
2. very common in India, particularly among children.
3. Under severe conditions it can be fatal because of the excessive loss of water and salts from the body.
4. Diarrhoea should not be neglected.
5. Even before a doctor is consulted the patient should be given plenty of boiled and cooled water with a pinch
6. of salt and sugar dissolved in it. This is called Oral Rehydration Solution (ORS).
7. Food partially digested and is called cud.
8. But later the cud returns to the mouth in small lumps and the animal chews it. This process is called rumination and these animals are called ruminants.
9. The grass is rich in cellulose, a type of carbohydrate.
10. Many animals, including humans, cannot digest cellulose.
11. Ruminants have a large sac-like structure between the small intestine and large intestine.

## FEEDING AND DIGESTION IN AMOEBA

1. Amoeba is a microscopic single-celled organism found in pond water.
2. Amoeba has a cell membrane, a rounded, dense nucleus and many small bubble-like vacuoles in its cytoplasm.
3. Amoeba constantly changes its shape and position.
4. It pushes out one, or more finger-like projections, called pseudopodia or false feet for movement and capture of food.
5. Amoeba feeds on some microscopic organisms.
6. When it senses food, it pushes out pseudopodia around the food particle and engulfs it.
7. The food becomes trapped in a food vacuole.
8. Digestive juices are secreted into the food vacuole.
9. They act on the food and break it down into simpler substances.
10. Gradually the digested food is absorbed.
11. The absorbed substances are used for growth, maintenance and multiplication.
12. The undigested residue of the food is expelled outside by the vacuole.
13. The basic process of digestion of food and release of energy is the same in all animals.
14. In a later chapter you will learn about the transport of food absorbed by the intestine to the various parts of the body.

## CHAPTER-4-HEAT

1. Our sense of touch is not always a reliable guide to the degree of hotness of an object.
2. Temperature is a measure of the degree of hotness of an object.

3. Thermometer is a device used for measuring temperatures.
4. Clinical thermometer is used to measure our body temperature. The range of this thermometer is from  $35^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ . For other purposes, we use the laboratory thermometers. The range of these thermometers is usually from  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ .
5. The normal temperature of the human body is  $37^{\circ}\text{C}$ .
6. The heat flows from a body at a higher temperature to a body at a lower temperature.
7. There are three ways in which heat can flow from one object to another. These are conduction, convection and radiation.
8. In solids, generally, the heat is transferred by conduction. In liquids and gases the heat is transferred by convection. No medium is required for transfer of heat by radiation.
9. The materials which allow heat to pass through them easily are conductors of heat.
10. The materials which do not allow heat to pass through them easily are called insulators.
11. Dark-coloured objects absorb radiation better than the light-coloured objects. That is the reason we feel more comfortable in light-coloured clothes in the summer.

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