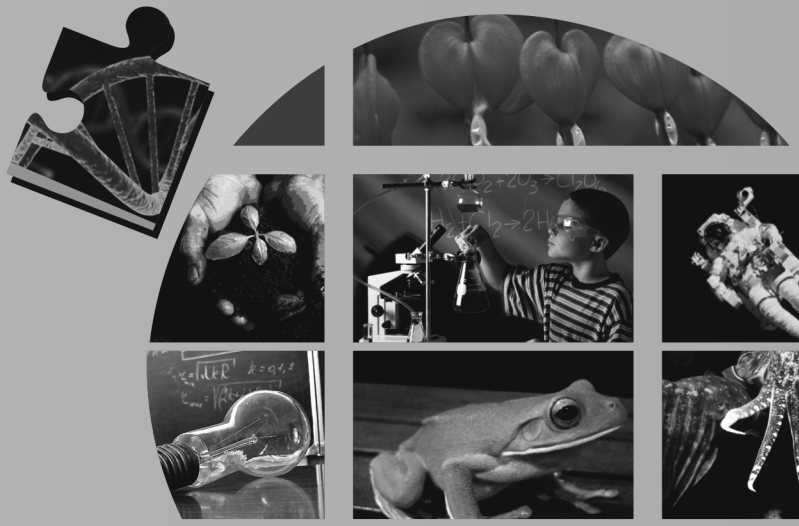


Modern Science

Teacher Manual

YBPL

4

MODERN SCIENCE - 4

CHAPTER - 1 : THE PRODUCERS

A. 1. b, 2. c, 3. b, 4. a **B.** 1. leafblade, 2. Green, 3. leaf, 4. leafblade, 5. midrib **C.** 1. F, 2. T, 3. F, 4. F, 5. T **D. 1.** A green colouring substance called chlorophyll give green colour to the leaves. **2.** 'Photo' means light and 'synthesis' means putting together, so photosynthesis means putting light and other raw materials together to make food. **3.** The food manufactured by plants is used for different purposes, such as : • Growth of the plant. • For building new cells and to repair the worn-out cells. • Extra food is stored in different parts of plant like the leaves, stems or roots in the form of starch. **4.** The animal's world depends upon plants for food. For example, mutton comes from a goat and we all know that goat is an animal. But what does the goat eat? It eats grass and grains. Grass is a plant and the grains are parts of a plant. **5.** They get their food from the dead and decaying matter. **HOTS : 1.** Because plants can prepare their food by using sun's energy and humans and animals depend on plants for their survival. **2.** The green stems of cactus make food for the plant. **3.** Rice **4.** There will be no life on such planet where plants are of blue colour. Because only green plants can make food. Humans and animals eat these plant for their survival.

CHAPTER - 2 : ADAPTATION IN PLANTS

A. 1. a, 2. a, 3. a, 4. a, 5. c, 6. b, 7. c **B.** 1. terrestrial, 2. stomata, 3. tall, 4. adaptation, 5. Egypt, 6. clayey, 7. floating. **C. 1.** Desert, **2.** Hills and Mountain, **3.** surface water **4.** Costal areas, **5.** Plains, **6.** Underwater, **D. 1.** The natural process by which plants adjust to their surroundings is called adaptation. **2.** On the basis of habitats all plants can be broadly divided into two types : i. Terrestrial or land plants ii. Aquatic or water plants **3.** Plants which are grow on hills and mountains do not shed all their leaves at the same time. A few leaves fall and new ones grow. So the trees are always green and are called evergreen trees. Eg: Pine, fir. **4.** a. Bamboo, the longest grass, is used to make chairs, mats, paper and curtains. b. Some plants of the grass family are used in preparing medinices. c. Dried grasses are used as packaging materials. d. The roots of grass plants help to conserve soil. **5.** Aquatic plants can be divided into three groups : a. Floating Plants : Plant like water hyacinth and duckweed float on water. b. Fixed Plants : Plants like lotus and water lily have roots that fix the plant in the mud at the buttom of the pond. c. Underwater Plants: Plants like hydrilla and tape grass grow under water. **6.** The spines prevent loss of water and also protect the plant from animals. **7.** They grow in soil which is poor in minerals. Venus flytrap,

pitcher plant, sundew are the examples of insectivorous plants. **HOTS : 1.** They would not be able to breathe or stand erect. **2.** Because their roots go deep into the soil in search of water which they do not get in marshy areas. **3.** No, Mango trees cannot survive in the cold. **4.** The broad and flat leaves are spread over the surface of water to catch maximum sunlight. The leaves have stomata only on the upper side.

CHAPTER - 3 : REPRODUCTION IN ANIMALS

A. 1. b, 2. c, 3. b, 4. b, 5. c. **B.** 1. Bird, 2. pupa, 3. Birds, 4. mammals,

C. 1. Do yourself, sping anteata, Duck billed platypus **2.** Hen-Duck, **3.** Butterfly-Cockroach, **4.** Snake-Lizard, **5.** Cow-Bitch. **D. 1.** The process by which animals produce young ones of their own kind is called reproduction. **2.** Each egg has a hard protective outer covering, called shell. Within the shell there is a white jelly-like substance, rich in protein called the albumen. In the middle of the egg is yolk which is rich in vitamins and minerals. **3.** Mammals take good care of their young ones. They feed them, clean them and keep them safe until they have learnt to look after themselves. **4.** Birds sit on their eggs to keep them warm. **5.** The life cycle of a frog has four stages. The egg cluster of the frog called spawn develops into a tadpole. Then it grows and slowly changes into a young frog, the legs grow longer and the tail grows shorter. Then it grows into an

adult frog, which has no tail. The process of growing into an adult frog from the tadpole is called Metamorphosis. **6.** Life cycle of a butterfly : a. Butterflies lay eggs on leaves. Inside each egg a caterpillar begins to grow. b. The eggs hatch into tiny caterpillars or larvae. c. The caterpillar spends all its time in eating. It becomes bigger and fatter. d. After a few days it stops eating and finds a safe place to rest. e. When the larva finds a suitable place, it starts spinning a silk thread from a hole below its mouth. This becomes a pad for it to lie on. This pad is called a cocoon. f. The caterpillar curls up inside the cocoon and goes to sleep. At this stage it is called pupa. g. The pupa stays in the cocoon for weeks or months. During this period it sheds its skin many times and gives rise to a beautiful butterfly. h. When the butterfly is ready to come out, the cocoon splits open. Slowly the butterfly crawls out, dries its wings, and flies away. Thus, a butterfly goes through four stages in its life cycle before becoming an adult. **HOTS : 1.** Many eggs and young fish are eaten by other bigger fishes. **2.** Reproduction of hen will stop. **3.** Peacock.

CHAPTER - 4 : ADAPTATION IN ANIMALS

A. 1. a, 2. c, 3. b, 4. b **B.** 1. Terrestrial, 2. Carnivores, 3. Arboreal, 4. breathe, 5. spines. **C.** 1. Lungs, 2. Amphibians, 3. Terrestrial, 4. Aquatic. **D. 1. Terrestrial or land animals** animals in plains,

animals in mountains, animals in deserts, **Aquatic animals:** aerial animals, arboreal animals. **2.** They have legs or limbs to move, lungs to breathe, hairy or thick skin to bear heat and cold well developed nervous system and sense organs. **3.** Monkey have long arms and tail for climbing and hanging on trees. **4.** a. They have fins and tails which help them to swim in water. b. Some water-birds like duck have webbed feet or paddle-like flippers as in turtles. **5.** Some animals merge with their surroundings to protect themselves from their enemies. This is called camouflage. Eg. chameleon changes its skin colour to blend with its surrounding. Camouflage helps the animals to hide from its predators and prey. These animals change their skin colour to blend with their surroundings. **HOTS : 1.** Kiwi, Emu, Penguin, Rhea. **2.** So that they can merge with snow and protect themselves from enemies. **3.** No, because they have adaptive features according to dry and hot place.

CHAPTER - 5 : OUR FOOD

A. 1. b, 2. a, 3. c, 4. c, 5. a **B.** 1. protein, 2. carbohydrate, 3. proteins,

4. diseases, 5. roughage. **C. 1.** Proteins, **2.** Carbohydrate, **3.** Vitamins & minerals, **4.** Ice-cream, **5.** Roughage **D. 1.** Proteins, carbohydrates, fats, vitamins and minerals. **2.** To preserve food we generally : a. Freeze it as in ice cream or custard. b. Can it as in tinned food. c. Salt it as in pickles. d. Sweeten it as in jams, jellies and chutnies. e. Oil it as in

pickles. f. Dehydrate it. Food thus preserved lasts longer. **3.** Proteins help in body building., growth and repair of worn-out cells. Children should take food rich in proteins. Proteins are also called body-building foods. Eg: Pulses, peas, beans, fish, egg, meat. Carbohydrates give us energy to work. So they are called energy-giving foods. People who do physical work need a diet rich in carbohydrates. **4.** Roughage is a fibre present in the food. It is not digested with the food but it helps in the digestion and removal of waste. **5.** A diet that contains all the nutrients, i.e., proteins, carbohydrates, fats, vitamins and minerals in right proportion along with water and roughage is called a balanced diet. **6.** Vitamins and Minerals keep us healthy by fighting against diseases. They help us in the formation of teeth, bones and blood. We need vitamins and minerals in small quantites but we must take them regularly. **HOTS : 1.** Because they are rich in vitamin C. **2.** a. By taking milk products. b. By taking food dishes made from milk. c. By taking shakes made from milk or flavoured milk. **3.** So that they do not get spoilt early. At low temperature, germs do not grow.

CHAPTER - 6 : TEETH AND DIGESTION

A. 1. c, 2. b, 3. c, 4. a, 5. b, 6. c, 7. b **B.** 1. 32, 2. premolars, 3. pulp,

4. saliva, 5. sugar, 6. digestion **C. 1.** c, **2.** d, **3.** e, **4.** a, **5.** b **D. 1.** Incisors : The sharp flat teeth in the front are for biting/cutting. Canine : Canines are tearing teeth. Premolars : These are grinding teeth. Molars : These also help in grinding food. **2.** Do yourself. **3.** a. Brush your teeth gently. b. Massage you gums with salt once a week. c. Rinse your mouth every time you eat. It removes food particles struck in the gaps. d. Avoid eating too many chocolates, sweets, and aerated drinks. **4.** The process of breaking down of food into simpler form is called digestion. **5.** a. Chew your food well. b. Do not talk while eating. c. Eat at a fixed time. **HOTS : 1.** a. Her tooth will get damaged and cause pain or bleeding. b. The tooth will loosen and fall off. c. Her teeth will get cavities which further will give rise to teeth diseases. **2.** It does not convert insoluble starch into soluble sugar and make digestion difficult. **3.** Incisors.

CHAPTER - 7 : CLOTHES AND FIBRES

A. 1. c, **2.** b, **3.** a, **4.** b, **5.** c **B. 1.** Coir, **2.** Cotton, **3.** Wool, **4.** natural,

5. Nylon **C. 1.** F, **2.** T, **3.** F, **4.** F, **5.** T **D. 1.** We wear clothes mainly to protect out body. Clothes protect us from cold, heat, dust and rain. They protect us from insects too. We also wear clothes to look good. They give us an identity of our own. **2.** We get wool mostly from sheep. We also get some wool from goats and camels. The fleece is cut off or sheared. **3.** We get fibres from natural as well as artificial sources. Fibres that we get from plants and animals are called natural fibres. We also produce fibres from different chemicals in factories. These are called synthetic fibres. **4.** Along with good laundering and mending techniques, our clothes will benefit from proper care and storage. **HOTS : 1.** Because they do not absorb water. **2.** No, Because cotton is not waterproof. It will absorb water and the person will get wet **3.** Because excessive moisture and heat lead to shrinkage of woollen clothes.

CHAPTER - 8 : SAFETY AND FIRST AID

A. 1. b, 2. c, 3. b, 4. c, 5. c, 6. b, 7. b, B. 1. Zebra, 2. Shallow, 3. Sharp, 4. crossing, 5. stove, 6. road C. 1. F, 2. T, 3. T, 4. F, 5. T, 6. F, D. 1. a. Small pieces of clean cloth, b. A pair of forceps (tweezers), c. A small roll of sterilized gauze and cotton pads, d. A small cotton roll, e. Some band-aid, antiseptic cream or lotion, painkiller. 2. Whenever a person is hurt, the first medical help the person gets is called First-aid. 3. a. Do not play with the matchbox and matchsticks. b. Do not try to light the stove or gas. c. Do not try to use the knife as it is very sharp. 4. a. Keep the things in their proper place. b. Do not leave your toys, games and books littered around. c. Do not run in the house specially if the floor has just been mopped and it is wet. d. Never play with electric plugs.**5.** Accidents happen when : a. We are careless. b. We are in a hurry. c. We do not follow safety rules. d. We find someone else being careless. **6.** a. Always cross the road at the zebra crossing. b. Before crossing, first look to your right, then left, and then to your right again. If road is clear, cross the road. c. Always walk on the pavement. d. Do not run on the road. It is not a playground. **7.** a. Do not slide down the banister. It is not a slide. b. Never run on the stairs. Always go up and down from the left side of the stairs. c. Do not take any sharp object to school. d. Do not jump on the benches in your class. **HOTS : 1.** Get drowned and die. **2.** Increase the chances of falling and getting hurt. **3.** Helmet, to protect

their heads during accidents. **4.** So that fire does not spread more.

CHAPTER - 9 : MATTER- SOLID, LIQUID, GAS

A. 1. b, 2. a, 3. c, 4. a, 5. b, 6. c, 7. c B. 1. microscope, 2. Water, 3. Solute, 4. different, 5. Liquid/Gas, 6. Solid, 7. ice C. 1. F, 2. T, 3. T, 4. T, 5. T, 6. F, 7. T, D. 1. Any substance that has mass and occupies space is called matter. 2. A solid has a fixed size and shape. Liquids have a definite volume, but they do not have a definite shape. The molecules of a solid are tightly packed. Gas has no shape or size of its own. The molecules are very loosely packed. 3. The smallest particle that make up matter and can exist independently are called molecules. 4. Gas has no shape or size of its own. Gas takes the shape of any container in which it is filled. The molecules in a gas are loosely packed. 5. A solid has a fixed size and shape. Solid cannot change its shape and size easily. The molecules in a solid are tightly packed. 6. Liquids have a definite volume, but they do not have a definite shape. Liquid takes the shape of the container it is poured. The molecules in a liquid are loosely packed and can move about. 7. Solute is the solid that dissolves in a liquid. 8. Solvent is the liquid in which a solute dissolves. HOTS : 1. Because gas has large spaces between molecules and it can spread easily. 2. Because the gas produced takes up the space inside the balloon. 3. Because gas spreads easily as its molecules have more

spaces between them. 4. Soap gets dissolved in water. (Solid dissolves in liquid)

CHAPTER - 10 : FORCE, WORK AND ENERGY

A. 1. b, **2.** c, **3.** a, **4.** a **B. 1.** muscular, **2.** Work, **3.** solar, **4.** work, **5.** heat, **6.** sun **C. 1.** Gravitational, **2.** Solar, **3.** Sun, **4.** Electrical **D. 1.** A push or pull is called force., **2.** Muscular and Frictional, **3.** Plants use the light energy of the sun to make food for all living things. When we eat this food, we get energy to work. So, we are dependent on the sun for our energy needs. **4.** The force exerted by the earth on all objects is called gravitational force. 5. Sun, moving air and water, fuels. **HOTS : 1.** (a) Work(W) = Force(F) x Displacement(S). So more work will be done while pushing a table through a greater distance. (b) Mass of the table is more so the work done on the heavy table is more. **2.** a. Solar energy to light energy, b. Muscular energy to electrical energy

CHAPTER - 11 : SOIL

A. 1. a, **2.** c, **3.** c, **4.** b, **5.** c, **B. 1.** soil, **2.** clayey, **3.** Sandy, **4.** Humus, **5.** erosion, **C. 1.** The dark brown covering over most of the land on the earth. **2.** The carrying away of the top fertile layer of the soil. **3.** The prevention of soil erosion. **4.** The organic matter in the soil that contains bits of dead plants and animals. **D. 1.** Soil is very important for all life forms living on the earth. Plants grow in the soil. The soil gives all nutrients that plants need to grow and plants give us oxygen and food to live. **2.** Soil is formed in several ways. The break down or weathering of rocks is one way by which soil is formed. The heat of the sun, and water, wind and ice also help to create soil, but the most important ingredient in the making of soil is the rock. **3.** The four types of soil are: (a) Gravel, (b) Sand, (c) Clay, (d) Loam. Loam is the best soil for growing plants. 4. Soil contains tiny bits of rock particles, dead remains of 'plants and animals' water and air **HOTS :** 1. The plants will not get enough oxygen to live., 2. Due to soil erosion, there is loss of nutrients in the rich top soil layer. This will cause less agricultural productivity. 3. Sandy soil is not good for agriculture because it cannot hold the water and it has big soil particles. It is found in deserts and other dry places.

CHAPTER - 12 : AIR, WATER AND WEATHER

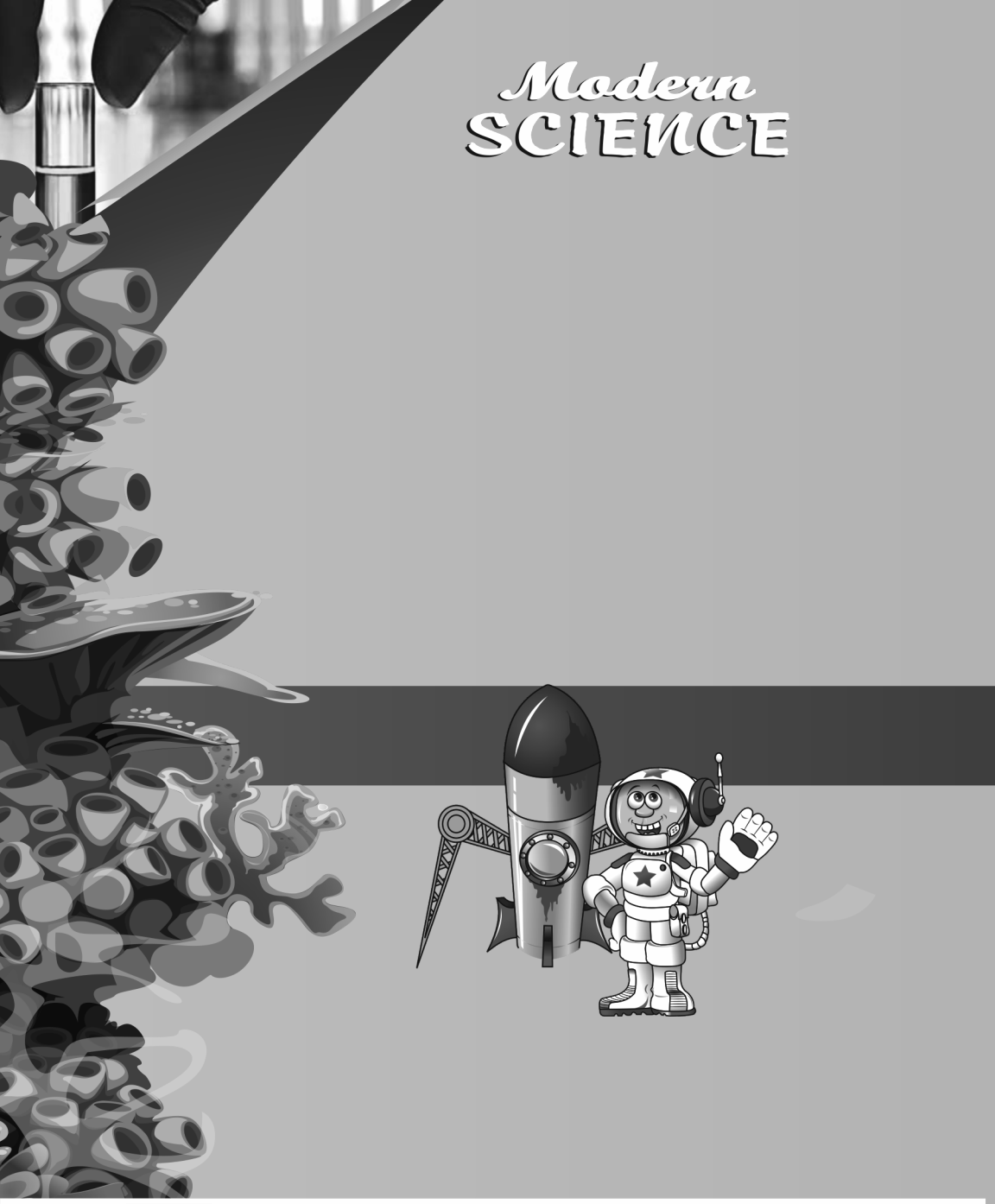
A. 1. b, **2.** b, **3.** c, **4.** b **B. 1.** water, **2.** atmosphere, **3.** water, **4.** evaporation, **C. 1.** T, **2.** T, **3.** F, **4.** T, **D. 1.** a. At night the land is cool and the sea is warm. Hot air above the sea rises, cool air above the land rushes to take its place. Breeze blows from land to the sea. b. Process of change of water into water vapour, on heating is called evaporation. **2.** Weather is the state of the atmosphere of a place at a particular time in relation to heat, cloudiness, dryness, sunshine, wind and rain. **3.** Do yourself, **4.** The changes in the weather take place because of the sun. **HOTS : 1.** a. Land will be dry and barren. b. There will be no plants. c. There will be no organism like humans or animals. 2. Because the air does not absorb water vapor or sweat and humidity increases in the atmosphere. 3. No, because there is no air on the moon.

CHAPTER - 13 : OUR EARTH AND ITS NEIGHBOURS

A. 1. a, **2.** b, **3.** b, **4.** a, **5.** a **B. 1.** eight, **2.** third, **3.** Venus, **4.** 5000, **5.** earth **C. 1.** d, **2.** c, **3.** b, **4.** a, **D. 1.** In the order of their increasing distance from the sun, the planets are : a. Mercury, b. Venus, c. Earth, d. Mars, e. Jupiter, f. Saturn, g. Uranus, h. Neptune **2.** A group of stars with a definite pattern is called a constellation. **3.** Artificial satellites are scientific instruments sent by scientists to orbit around the Earth.

4. Because it has air and water which supports life. **5.** A group of stars with a definite pattern is called a constellation. **HOTS : 1.** There will be no change of seasons, 2. Because earth keeps rotating on its axis due to which only half portion of the earth receives sunlight. **3.** No. Mercury can't support life on it because it has no oxygen, no water, no air. The temperature is extremely hot & plants can't grow on its surface, so food can't be grown. And without this people can't live.

Modern SCIENCE



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