YOUTH COMPETITION TIMES PRESENT

NCERT SCIENCE

Class VI to X

Study Material & Objective Questions (MCQs)

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INDEX

Science

Class-VI

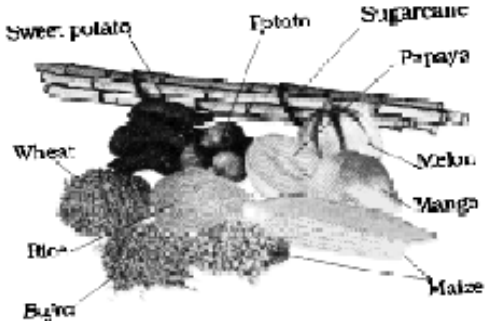
Chapter-1 Components of Food

Nutrients

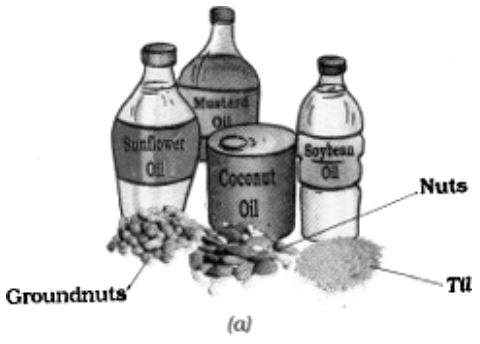
- Those ingredients which contain some components that are needed by our body. These components are called nutrients.

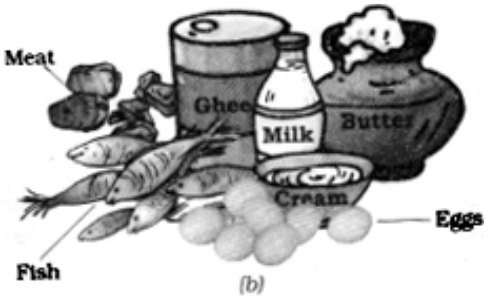
Types of Nutrients

- The major nutrients in our food are named Carbohydrates, Proteins, Fats, Vitamins, and minerals. Food contains dietary fibers and water which are also needed by our body.



Some sources of carbohydrates

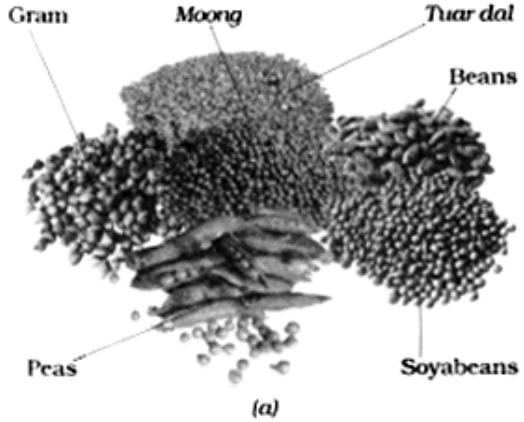


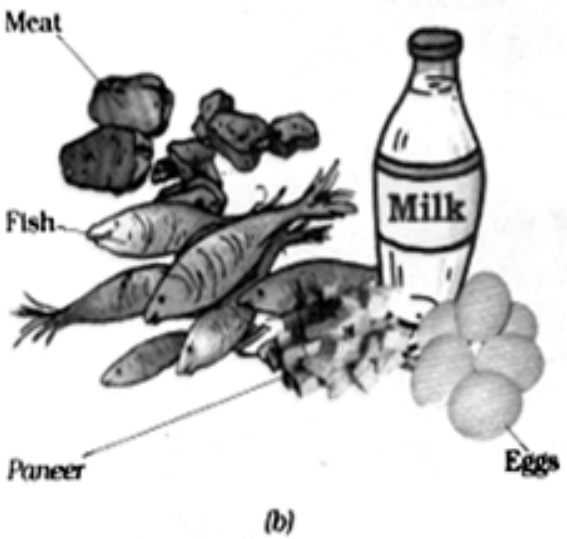


Some sources of fats: (a) plant sources and (b) animal sources

Role of Proteins

- Proteins are needed for the growth and repair of our body. Food proteins are often called 'body building foods'.





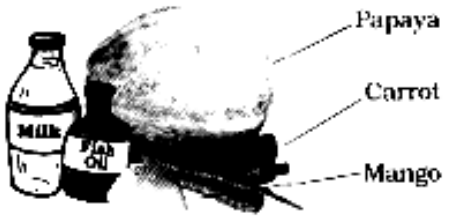
Some sources of proteins: (a) plant sources and (b) animal sources

Vitamins

- Vitamins are of different kinds known by different names. Some of these are Vitamin A, Vitamin C, Vitamin D, Vitamin E and K. There is also a group of vitamins called Vitamin B-complex.

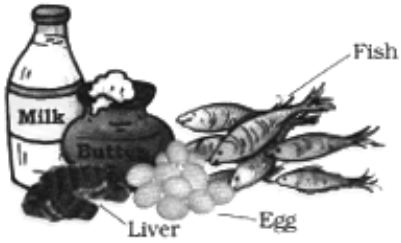
■ **Role of vitamins**

- Vitamins help in protecting our body against diseases. Vitamins also help in keeping our eyes, bones, teeth and gums healthy.



Some sources of Vitamin A

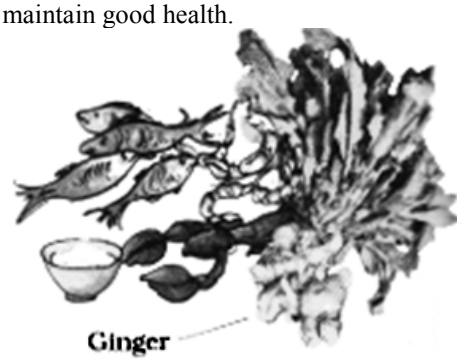
Some sources of Vitamin C



Some sources of Vitamin D

Minerals

- Minerals are needed by our body in small amounts. Each one is essential for proper growth of body and to maintain good health.



Some sources of iodine

Some sources of Phosphorous

Some sources of iron

Sources of some minerals

Balanced Diet

- The diet should contain a good amount of roughage and water. Such diet is called a balanced diet.

Deficiency Diseases

- Deficiency of one or more nutrients can cause diseases or disorders in our body. Diseases that occur due to lack of nutrients over a long period are called deficiency diseases.
- All deficiency diseases can be prevented by taking a balanced diet.

Important Questions

1. Which of the following options is an example of a balance diet?

(a) Burgers, chips, cold drinks
(b) Roti, vegetables, cold drinks
(c) Roti, pulses, vegetables
(d) Rice, chips, cold drinks

Ans. (c) : Amongs the given option, option (c), Roti, pulses, vegetables is an example of a balance diet. A diet that contains all the essential nutrients like proteins, carbohydrates, vitamins, minerals and fibers is called as balance diet.

2. Which of the following is a balanced diet in itself, and is considered good for teenagers?

(a) Pulses (b) Roti/Rice
(c) Milk (d) Vegetable

Ans. (c) : Milk is considered as a complete nutritious food. It contains Calcium, Magnesium, Zinc, Phosphorus, Iodine, Potassium, Folic acid, Vitamin A, Vitamin D Riboflavin, Vitamin B_{12}, Protein and healthy fat. Casein protein is a protein found in milk, which gives white colour to milk.

3. In which of the following food items, Iron is found in abundant?

(a) Rice (b) Butter
(c) Jaggery (d) Milk

Ans. (c) : In the given option, Iron is found in abundant in Jaggery. Iron is an important component in our body which helps in maintaining skin, hair, cells and other things along with relieving fatigue, its deficiency causes shortness of breath, weakness, headache, dizziness, loss of appetite etc.

4. Which of the following is a good source of vitamin A?

(a) Cabbage (b) Carrot
(c) Potato (d) Strawberry

Ans. (b) : The chemical name of vitamin A is retinal. Its source is all type of green leafy vegetables and fruits like carrots, papaya etc. Its deficiency causes night blindness and xerophthalmia. It is also called - infection vitamin, because it prevents bacterial infection in the body.

5. Which of these foods is called body building food?

(a) Food rich in protein such as peas.
(b) Food rich in fat, such as butter.
(c) Vitamin rich food such as apple.
(d) Food rich in carbohydrates such as wheat.

Ans. (a) : Protein is commonly known as body-building food. These are more nutrients that provide the body with nutrients for cell growth and repair, in which milk chicken, fish, egg and pulses are rich source of proteins.

6. Carrots contain high amounts of Vitamin A. How does eating carrot help the child?

(a) This will improve the eyesight of the child
(b) This will strengthen the bones of the child.
(c) This will help the child to fight many diseases.
(d) This will provide good amount of energy to the child.

Ans. (a) : Carrots are rich in beta-carotene, which the body converts into vitamin A. Vitamin A is essential for good vision, particularly in low condition.

7. Which of the following dietary components provides maximum energy per gram in humans?

(a) Protein (b) Roughage
(c) Carbohydrate (d) Fat

Ans. (d) : Fat is the main food item that provides energy to the body. Fat molecules are formed by the combination of glycerol and fatty acids like carbohydrates, fats are also compounds of carbon, hydrogen & oxygen. By complete oxidation of its water 9.3 Kcal of energy released. The main source of fats are milk, meat, fish, peanut oil, ghee etc.

8. Cyanocobalamin is a man-made form of the vitamin-

(a) B_{12} (b) B_6
(c) B_2 (d) B_1

Ans. (a) :

Vitamins		Chemical name
Vitamin B_{12}	-	Cyanocobalamin
Vitamin B_6	-	Pyridoxine
Vitamin B_2	-	Riboflavin
Vitamin B_1	-	Thiamine
Vitamin B_5	-	Pantothenic acid

9. In which of the following elements, hence of human blood is a part of heme/haem?

(a) Manganese (b) Iron
(c) Cobalt (d) Magnesium

Ans. (b) : Heamoglobin is found in RBC in which Iron-containing pigments heme is present. Due to this the colour of blood is 'red'. The iron containing compound present in heme is called "Hematin".

10. In the context of deficiency diseases, Rickets is caused by the deficiency of _____.

(a) Vitamin C (b) Vitamin E
(c) Vitamin D (d) Vitamin B-12

Ans. (c) :

Vitamins	-	Chemical name	-	Disease
Vitamin A	-	Retinol	-	Night blindness
Vitamin B_{12}	-	Cyanocobalamin	-	Anemia
Vitamin E	-	Tocopherol	-	Infertility
Vitamin D	-	Calciferol	-	Rickets

11. Cod liver oil is obtained from fish is a rich source of which Vitamin?

(a) Vitamin C (b) Vitamin B_{12}
(c) Vitamin D (d) Vitamin B

Ans. (c) : Cod liver oil obtained from fish is a rich source of Vitamin D. Fish oil contains omega-3 fatty acids (EPA and DHA).

12. Which diseases is caused by deficiency of Vitamin C?

(a) Rickets (b) Beriberi
(c) Scurvy (d) Night blindness

Ans. (c) : Scurvy is a disease caused by deficiency of Vitamin C. Due to its deficiency, gums swell and teeth start falling. The chemical name of Vitamin C is Ascorbic acid, Vitamin 'C' is found in Orange, lemon, amla and tomato etc.

13. Given below is an assertion (A) and reason (R).
Assertion (A) : Beri- Beri is viral infection.
Reason (R): Vitamin deficiency causes disease.
Choose the right option-

(a) A is wrong but R is correct
(b) A is correct but R is wrong
(c) Both A and R are wrong
(d) Both A and R are correct and R is the correct explanation of A.

Ans. (a) : Beri- Beri disease is caused by deficiency of vitamin B_1 (thiamine). It is not a viral infection. The given statement is incorrect, while the reason is correct that vitamin deficiency causes disease.

14. Name that vitamin due to its deficiency there is excessive bleeding.

(a) Vitamin A (b) Vitamin B
(c) Vitamin K (d) Vitamin C

Ans. (c) : Due to deficiency of vitamin K. There is excessive bleeding. The chemical name of this Vitamin Phylloquinone.
It is an antihemarrhagic vitamin that is necessary for the formation of prothrombin in the liver. Due to deficiency of this vitamin blood clot does not formed in human body and there is excessive bleeding at the cut places. It is found in green leafy vegetables tomato etc.
● The chemical name of vitamin A is Retinal. Due to its deficiency a disease caused named night blindness.
● **Vitamin B:** Its chemical name is thiamine. Its deficiency causes a disease named Beri- Beri.
● **Vitamin C:** Its chemical name is ascarbic acid, its deficiency causes a disease named scurvey.

15. Beri - Beri is a disease which caused due to deficiency of _____.
(a) Vitamin A (b) Vitamin B
(c) Vitamin D (d) Vitamin C

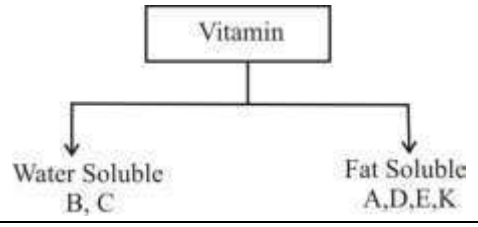
Ans. (b) : Vitamin	**Deficiency disease /disorder**
Vitamin B_1	Beri- Beri
Vitamin A	Xerophthalmia, Night blindness
Vitamin C	Scurvy, gingivitis
Vitamin D	Rickets (in children) Osteomalavia (in adults)

16. What is the common name of E 300?
(a) Vitamin D (b) Vitamin C
(c) Vitamin B (d) Vitamin A

Ans. (b) : The common name of antioxidant E 300 is Vitamin C. The chemical name of Vitamin C is 'ascorbic acid'. Its deficiency causes scurvey.
The main source of vitamin C are tomato, lemon, Amla and orange etc.

17. Which of these is a water soluble vitamin?
(a) Vitamin D (b) Vitamin E
(c) Vitamin B (d) Vitamin A

Ans. (c) : Vitamin was invented by Casimir funk in 1992 AD. It is a type of organic compound no energy is obtained from these but they are essential for metabolism in the body. It is also called protective substance. There are two type of vitamins on the basis of solubility.



18. Which Vitamin activates the proteins and calcium required for blood clotting.
(a) Vitamin B (b) Vitamin K
(c) Vitamin D (d) Vitamin C

Ans. (b) : Deficiency of vitamin K leads to reduction in blood clotting. Due to its deficiency bones are also weak. Vitamin K activates the protein and calcium needed for blood clotting.

Vitamin	**Deficiency disease**
Vitamin B_1	Beri- Beri
Vitamin D	Rickets
Vitamin C	Scurvy
Vitamin A	Night blindness
Vitamin E	Reduce fertility

19. In which of the following Vitamins, yeast in found in abundance?
(a) Vitamin B (b) Vitamin C
(c) Vitamin K (d) Vitamin A

Ans. (a):

Vitamin	**Chemical Name**	**Sources**
Vitamin B (B_2)	Riboflavin	Yeast, liver, meat, green Vegetables, milk
Vitamin C	Ascorbic acid	Hemon, orange, chili, sprouted grains, tomato, tangerine.
Vitamin A	Retinal	Milk, egg, cheese, green, vegetables, fish oil.
Vitamin K	Phylloquinone	Tomato, also produced in the intestine, green vegetable.

20. _____ has three active forms. Retinal, retinol and retinoic acid.
(a) Vitamin-B (b) Vitamin- A
(c) Vitamin-D (d) Vitamin- C

Ans. (b) : Vitamin A has three active forms retinal, retinol and retinoic acid. It is a fat soluble vitamin. Its deficiency causes night blindness. It is found in abundance in carrots, green leafy vegetables, milk and fish.

21. Which vitamin keeps our eyes and skin healthy?
(a) Vitamin D (b) Vitamin A
(c) Vitamin B (d) Vitamin E

Ans. (b) : The chemical name of vitamin A is retinol. It is a fat soluble vitamin. Vitamin A is necessary to keep the outer skin of the body healthy and this vitamin is essential for the pink pigment rhodapsin found in the retina of the eyes. Deficiency of vitamin A cause night blindness and xerophthalmia. Carrot, green vegetables, milk, cod liver oil etc are the major source of vitamin A.

22. Megaloblastic anemia is caused by deficiency of which vitamin?
(a) Vitamin B_2 (b) Vitamin C
(c) Vitamin B_9 (d) Vitamin A

Ans. (c): Vitamin	Deficiency diseases
Vitamin B_9	Megaloblastic diseases
Vitamin B_2	Skin cracking redness of eyes
Vitamin C	Scurvy
Vitamin A	Night blindness

23. Which of the following is stored as glycogen in the body?
(a) Carbohydrate (b) Protein
(c) Lipid (d) Vitamin

Ans. (a) : Carbohydrate are stored in body in the form of glycogen. It is water soluble and sweet in taste and is the main sources of energy for the cells of living beings.

24. Which vitamin increases the absorption of calcium in the body?
(a) A (b) D
(c) B (d) B_6

Ans. (b) : Vitamin D increases the absorption of calcium in the body.

Chapter-2 Sorting Materials into Groups

Materials

- A material is a substance or mixture of substances that constitutes an object. Materials can be pure or impure, living or non-living matter.

Properties of Materials

Appearance

- Materials usually look different from each other. Wood looks very different from iron. Iron appears different from copper or aluminium.

Hardness

- Materials which can be compressed or scratched easily are called soft while some other materials which are difficult to compress are called hard. For example, cotton or sponge is soft while iron is hard.

Soluble or Insoluble

- Some substances have completely disappeared or dissolved in water.
- Other substances do not mix with water and do not disappear even after we stir for a long time. These substances are insoluble in water.

Transparency

- Those substances or materials, through which things can be seen, are called transparent. Glass, water, air and some plastics are examples of transparent materials.
- On the other hand, there are some materials through which you are not able to see. These materials are called opaque. Wood cardboard and metals, are examples of opaque materials.
- The materials through which objects can be seen, but not clearly, are known as translucent.

Important Questions

1. In potato _____ is present.
(a) Starch (b) Calcium
(c) Fat (d) Phosphorus

Ans. (a) : Most starch is found in potatoes. Antioxidants are found in potatoes which protect against damage caused by radicals. Apart from the magnesium, phosphorus, iron and zinc are also found in it. The starch present in potatoes is also called carbohydrate.

2. Goiter disease is caused by deficiency of ?
(a) Vitamin C (b) Calcium
(c) Iodine (d) Phosphorus

Ans. (c) : Goiter disease is a minor disease, which occur due to lack of iodine in our food. Iodine is usually consumed in the diet in the form of iodized salt. Goiter disease is an abnormal growth of the thyroid gland that is the throat becomes swollen in goiter disease.

3. The main sources of roughage-
(a) Rice
(b) Gram flour
(c) Water
(d) Fresh fruits and vegetables

Ans. (d) : The main sources of roughage includes fresh fruits and vegetables as well as whole grains, pulses, potatoes etc. The fibrous, rough and low nutrition grass and chaff present in the diet of animals is called roughage animals get them in the form of dry straw, grass etc.

4. During starch test, the color of the load changes when a few drops of a mild solution of tincture iodine is added to the food.
(a) Blue (b) Black
(c) Blue or Black (d) None of these

Ans. (c) : The starch test is an test, in which iodine solution is poured on the food item, i.e. for the starch test, take a material like potato and add 2 or 3 drops of dilute iodine solution to it, observe the change in color of the food. This blue will turn black. This blue black colour indicates the presence of starch.

5. Nutrients that provide maximum energy are called-
(a) Fat (b) Carbohydrate
(c) Fat and Carbohydrate (d) None of these

Ans. (a) : Fat and carbohydrates are the basic nutrients that provide energy on which our body depends for the main source of energy. Food energy is usually expressed in terms of calories. Proteins and carbohydrates provide 4 kcal of energy per gram, while fats provide 9 kcal of energy per gram so the fat is the source of maximum energy.

6. Which of the following is a soft substance?
(a) Soap (b) Rubber
(c) Wood (d) Iron

Ans. (b) : Materials which can be easily compressed or stretched are called soft materials, such as rubber, cloth, cotton or sponge etc. are examples of soft matter.

7. The following substances do not shine-
(a) Iron (b) Copper
(c) Gold (d) Wood

Ans. (d) : Among the following materials, wood is dull in appearance hence wood is not shiny.

8. Which of the following substances can be a solvent other than water?
(a) Wood (b) Turpentine oil
(c) Sugar (d) Mustard oil

Ans. (b) : Turpentine oil is liquid that can dissolve other substances, making it a solvent. Wood and sugar are not liquid substances and therefore can not act as solvent. Mustard oil is liquid but not a solvent.

9. The solution which does not have the capacity to dissolve more amount of solute is called-
(a) Saturated solution
(b) Unsaturated solution
(c) Light solution
(d) Thick solution

Ans. (a) : A saturated solution is one that can not dissolve any more solute at a given temperature and pressure. This means that the solution has reached its maximum capacity for the solute.

10. Such substances through which objects or things appear vaguely blurred are called.
(a) Transparent (b) Opaque
(c) Translucent (d) None of these.

Ans. (c) : Translucent objects fall between opaque and transparent substances. Translucent objects allow some light to pass through them, some not but partially. When light strikes a translucent material, only a certain amount of light passes through the material. Light changes its direction many times and is so translucent that we cannot see through them clearly. Additionally objects on the other side of a translucent object appear blurry and indistinct.

11. Substances which dissolve in water or other liquids are called-
(a) Soluble (b) Insoluble
(c) To surround (d) Drain

Ans. (a) : Such substances which dissolve easily in water and other liquids are called soluble substances. Like salt, sugar etc.

12. Which of the following substances changes directly from solid state to gaseous state?
(a) Ice (b) Water
(c) Camphor (d) Milk

Ans. (c) : Sublimation is a process in which a substance is directly changed from solid state to gaseous state. Household Example- include the use of camphor, naphthalene balls and salt.

13. The liquid of an unboiled egg changes after receiving heat-
(a) Solid (b) Liquid
(c) Gas (d) None of these

Ans. (a) : On continuous heating of the egg, more bonds are formed in the yolk (liquid), in which less space is left for water, hence after heating the yolk get converted into solid state.

14. Which of the following substances is normally found in all three states of matter-
(a) Water (b) Camphor
(c) Naval officer (d) Milk

Ans. (a) : Water is a substance which is normally found in all three states of matter. The three states of matter are solid, liquid and gas.

Chapter-3 Separation of Substances

❒ The substances to be separated may be particles of different sizes or materials. These may be in any three states of matter i.e., solid liquid or gas.

Methods of Separation

❒ Some simple methods of separating substances that are mixed together.

Handpicking

Handpicking stones from grain

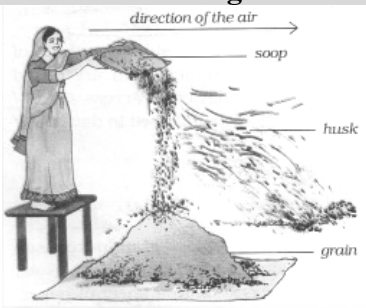
❒ The method of handpicking can be used for separating slightly larger sized impurities like the pieces of dirt, stone and husk from wheat, rice or pulses.

Threshing

Threshing

❒ The process that is used to separate grain from stalks etc. is threshing. Machines are also used to thresh large quantities of grain. Sometimes, threshing is done with the help of bullocks.

Winnowing



Winnowing

- Method of separating components of a mixture is called winnowing. Winnowing is used to separate heavier and lighter components of a mixture by wind or by blowing air.

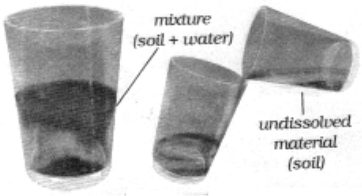
Sieving

Sieving

Pebbles and stones are removed from sand by sieving

- Sieving allows the fine flour particles to pass through the holes of the sieve while the bigger impurities remain on the sieve.
- Sieving is used when components of a mixture have different sizes.

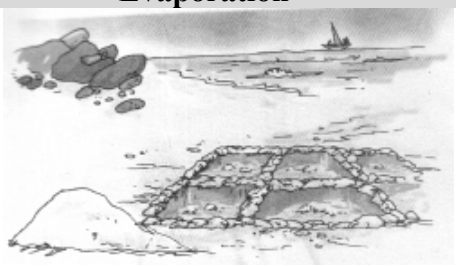
Sedimentation, Decantation and Filtration



Separating two components of a mixture by sedimentation and decantation

- When the heavier component in a mixture settles after water is added to it, the process is called sedimentation. When the water (along with the dust) is removed, the process is called decantation.
- If a mixture of such liquids is allowed to stand for some time, they form two separate layers the component that forms the top layer can then be separated by decantation. This process is called filtration.

Evaporation



Obtaining salt from sea water

- The process of conversion of water into its vapour is called evaporation. The process of evaporation takes place continuously wherever water is present.

Important Questions

1. The textile fibers which are obtained from plants or animals are called-

(a) Natural fiber (b) Man made fiber
(c) Naturals man made (d) None of these

Ans. (a) : The fibers which are obtained from plants or animals are called natural fibers. Fibers obtained from plants are cotton, jute and fibers obtained from animals are wool and silk etc.

2. Man made fibers are-

(a) Polyester (b) Nylon
(c) Acrylic (d) All of the above

Ans. (d) : These fibers which are made using chemicals in laboratories are called man-made fibers, that is nylon. Polyester, acrylic and rayon etc are example of man-made fibers. Rayon is cheaper than silk and can be woven like silk fiber.

3. Which of the following mixture can be separated by different funnels?

(a) Alcohol and water (b) Salt and water
(c) Oil and water (d) Iodine in alcohol

Ans. (c) : The mixture of oil and water can be separated by different funnels because, it is a heterogeneous mixture generally there are two type of mixtures.
(i) Homogeneous mixture :- Those mixture whose constituent particles cannot be seen separately for example, aqueous solution of salt cannot be seen separately into salt and water.
(ii) Heterogeneous mixture:- Those mixture whose constituent particles can be seen separately for example, even if oil is poured into water, the oil remains on top and the water settled down.

4. Process of making thread from fibers is called-

(a) Spinning (b) Weaving
(c) Washing (d) Dyeing

Ans. (a) : Converting fibers into threads is called spinning. This is the first stage of the textile manufacturing process. After this there is the process of making thread i.e. called spinning.

5. Method of making clothes from thread are ____.

(a) Weaving
(b) Binding
(c) Weaving and knitting
(d) None of these

Ans. (c) : Weaving and knitting both the method of making clothes from thread.
Weaving:- By arranging two sets of threads together is the process of making clothes from thread called weaving.
Knitting:- It is the process of using a single thread or yarn to make a piece for a garment.
● Both these techniques are done by hand and machine.

6. In which of the following can show sublimation?

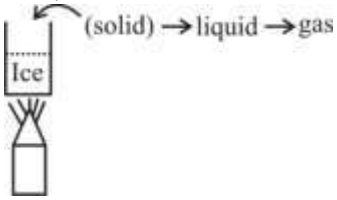
(a) Ammonium nitrate
(b) Ammonium sulphate

(c) Ammonium chloride
(d) Ammonium sulphide

Ans. (c) : Sublimation is a process where a substance transitions directly from a solid to a gas without passing through the liquid state. Among the options ammonium chloride (NH_4Cl) is known to undergo sublimation.
Ex. Camphor

7. In which of the following is not sublimation?
(a) Ice
(b) Ammonium chloride
(c) Napthalene
(d) Camphor

Ans. (a) : Sublimation:- When we heat a substance and it changes directly from solid to gas, then that process is called sublimation.
If we heat ice, then-



Therefore ice does not sublimate.

8. Which of the following methods will separate water from muddy water?
(a) Separating funnel (b) Distillation
(c) Crystallization (d) Filtration

Ans. (d) : To separate water from muddy water, which is filtered through a special filter paper. Particles larger than a certain size cannot pass through this filter paper. This process is called filtration.

9. Which process is used in water purification?
(a) Osmosis (b) Reverse osmosis
(c) Cytolysis (d) Turgar pressure

Ans. (b) : Reverse osmosis is used in sea water purification to remove salt and other substances from water molecules. It is not worthy that is osmosis is the molecule of solvent move from a solution of higher concentration to a solution of lower concentration.

10. What is desalination?
(a) It is a process of cleaning the environment
(b) It is a process in which salt separates minerals from water
(c) It is the process of removing caffeine
(d) It is the process of purification

Ans. (b) : Desalination is a process in which minerals are separated from salty water. Generally, the process of removing salt and minerals is also called desalination. Desalination is done to convert salt water into fresh water.
This process sometimes produces table salt as a by-product so that it remains suitable for human consumption or irrigation.

11. What is called the process of separating hydrogen from water?
(a) Electrolysis (b) Osmosis
(c) Ozonolysis (d) Oxidation

Ans. (a) : The method of separating hydrogen and oxygen from water is called electrolysis. This method is also used in industrial areas. It helps in the production of aluminum, lithium, sodium potassium etc.

$$2H_2O \xrightarrow{\text{Electrolysis}} O_2 + 4H^+ + 4e^-$$

12. Which of the following is not a sublimating substance?
(a) Sodium sulphate (b) Camphar
(c) Ammonium chloride (d) Naphthalene

Ans. (a) : Sublimation is a physical process. The process by which a substance changes its state directly from solid to gas is called sublimation. During this entire process the state of the element does not change into any intermediate liquid state like camphor, ammonium chloride, naphthalene are sublimating substance where as sodium sulphate is not sublimating substance.

13. The one of the technology used for desalination of sea water is _____.
(a) Filtration (b) Distillation
(c) Evaporation (d) Condensation

Ans. (b) : The one of the technology used for desalination of sea water is distillation. Distillation is a physical method of separation. The phenomenon of gas becoming liquid is called as condensation.
- The change of any element or compound from liquid state to gas is called vaporization.

14. In which of the following process would you use to separate ammonium chloride from sodium chloride ?
(a) Distillation (b) Sublimation
(c) Crystallization (d) Filtration

Ans. (b) : Sublimation process is used to separate ammonium chloride (NH_4Cl) from sodium chloride (NaCl). Sublimation is a method of separating substances from a mixture in which when a solid substance is heated, it directly vaporizes without liquifying. For example, when camphor and ammonium chloride are heated they directly converted into vapour.

15. The process of separating substances is called -
(a) Evaporation (b) Choose
(c) Filtering (d) Any of these

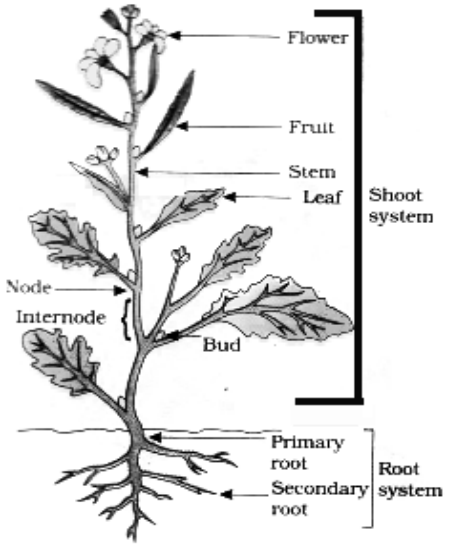
Ans. (d) : The process of separating substances is called separation which includes evaporation, picking etc

16. When the mixture is in very small quantity then which method will be better to separate it?
(a) Choose (b) Promotion
(c) Drain (d) Chromatography

Ans. (d) : For separating a mixture in very small quantities, chromatography is the best method. It allows for precise separation of components based on their movements through a medium, making it ideal for small scale separations.

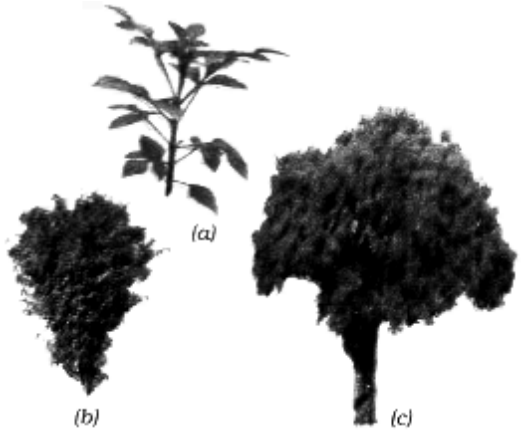
Chapter-4 Known Plants

- Some plants are small, some very big, while some are just patches of green on the soil. Some have green leaves, while some others have reddish ones. Some have huge red flowers, some have tiny blue ones, while some have none.



Parts of a plant

Herbs, Shrubs and Trees



(a) Herb, (b) shrub and (c) tree

- Based on these characters most plants can be classified into three categories: herbs, shrubs and trees.

Herbs

- Plants with green and tender stems are called herbs. They are usually short and may not have many branches.
- **Example-** Wheat, paddy, tomato, etc.

Shrubs

- Some plants develop branches near the base of stem. The stem is hard but not very thick. Such plants are called shrubs.
- **Example-** Rose, jasmine, lemon, tulsi, and henna etc.

Trees

- Some plants are very tall and have hard and thick stem. The stems have branches in the upper part, much above the ground. Such plants are called trees.
- **Example-** Mango, guava, pipal etc.

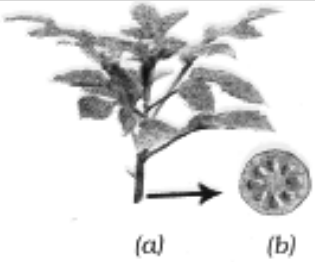
Creepers and climbers

- Plants with weak stems that cannot stand upright but spread on the ground are called creepers, while those that take support and climb up are called climbers. These are different from the herbs, shrubs and trees.

Creepers

Climbers

Stem



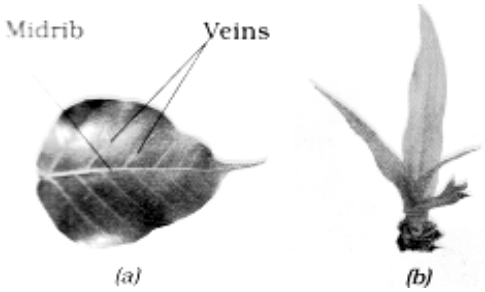
(a) Water moves up the stem and reaches

- Stems bear leaves, branches, buds, flowers and fruits. The stem helps in upward movement of water.

Leaf

Leaf

- The part of leaf by which it is attached to the stem is called petiole. The broad, green part of the leaf is called lamina.



Leaf venation (a) reticulate and (b) parallel

- Lines on the leaf are called veins. The middle of the leaf this is called the midrib. The design made by veins in a leaf is called the leaf venation. If this design is net-like on both sides of midrib, the venation is reticulate.
- In the leaves of grass you might have seen that the veins are parallel to one another. This is parallel venation.

Transpiration

- Water comes out of leaves in the form of vapour by a process called transpiration. Plants release a lot of water into the air through this process.

Photosynthesis

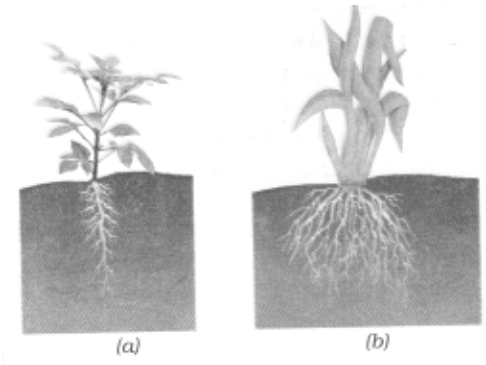
- Leaves prepare their food in the presence of sunlight and a green colored substance present in them. For this they also use water and carbon dioxide. This process is called photosynthesis. Oxygen is given out in this process.

Root

- Roots help in holding the plant firmly to the soil. They anchor the plant to the soil.

■ **Type of roots**

- For roots of the kind shown in the main root is called tap root and the smaller roots are called lateral roots. Plants with roots as shown do not have a main root. All roots seem similar and these are called fibrous roots.



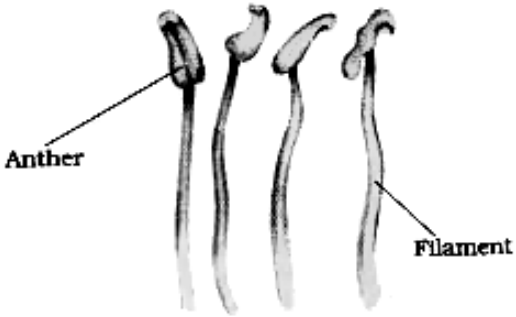
(a) Taproot and (b) fibrous roots

- Roots absorb water and minerals from the soil and the stem conducts these to leaves and other parts of the plant.

Flower

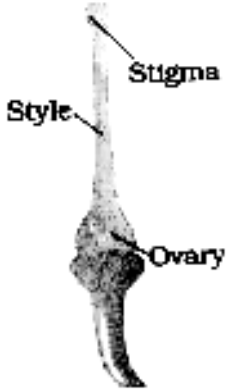
- The prominent parts of the open flower these are the petals. The most prominent part in a bud, part is made of small leaf-like structures. They are called sepals.

Parts of a flower



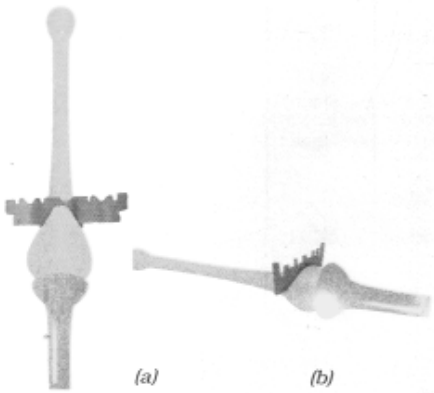
Parts of a stamen

- The innermost part of flower is called the pistil.

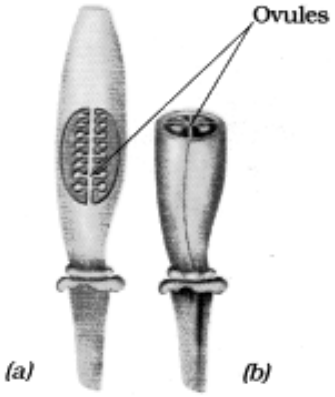


Parts of a pistil

- The structure of ovary, it is the lowermost and swollen part of the pistil.



Cutting an ovary (a) longitudinal cut and (b) transverse cut



Inner structure of an ovary (a) longitudinal cut, (b) transverse cut

❒ The inner parts of the ovary using a lens. See some small bead like structures inside the ovary. They are called ovules.

Important Questions

1. Plant store food for future use in the form of-

(a) Plumule (b) Radical.
(c) Cotyledon (d) Embryo.

Ans. (c) : Seed is formed from ovule. Plant store food in the cotyledons of seeds it is noteworthy that after fertilization seed develop from the ovule. The seed usually consist of a seed coat and an embryo. The embryo consists of a radicle, an embryonic axis and one. (wheat, maize) or two (gram, pea) Cotyledons.

2. _____ functions as a food store in the seed of plants.

(a) Ovule (b) Cotyledons
(c) radicle (d) Radix

Ans. (b) : Cotyledon is an important part of the seeds of plants. When the seeds of some plants germinate, this Cotyledon develops and takes the form of the first leaf of the plant, which acts as a food store, while female reproductive cells are formed and stored in the Ovule. In plants radicle is the front part of the seed from which germination of leaves, branches etc. begins and the part that emerges from the root or radicle at the time of setting of the seed is called root.

3. What is tomato?

(a) Vegetable (b) Fruit
(c) Pod (d) Edible stem.

Ans. (b) : Tomato is a fruit. The edible parts of tomato are pericarp and nucellus. Its botanical name is *Solanum lycopersicum*. It originated in South America. A pigment called lycopene found in tomatoes.

4. Which of the following is not generally used as a fruit?

(a) Strawberry (b) Grapes
(c) Pear (d) Tomato

Ans. (d) : Tomato is generally not used as a fruit. It is used as a vegetable.

5. Which of the following is not a multi – seeded fruit?

(a) Papaya (b) Apple
(c) Litchi (d) Pomegranate

Ans. (c) : Litchi is monocotyledonous fruit, where as papaya, apple and pomegranate are multi cotyledons.

6. Plant root cells also produce energy. Oxygen is required for this. Therefore they take is air from the roots.

(a) Water
(b) Stomata
(c) Air space between soil particles.
(d) Cytoplasm.

Ans. (c) : Plants have their roots underground but root cell also need oxygen for respiration, which produces energy for their own use. The roots of plants draw air from the space between the soil particles.

7. Why are long hair – like parts often found in the water – absorbing epidermal cell of roots?

(a) To increase the surface area available for absorption.
(b) To reduce the surface area available for photosynthesis.
(c) To increase the surface area available for transpiration.
(d) For locomotion

Ans. (a) : Long hair – like structures are often found in the water absorbing epidermal cells of roots to increase the surface area available for absorption.

8. Where do plant roots obtain oxygen from?

(a) Form the water present in the soil.
(b) Roots do not require oxygen.
(c) From the air spaces present between the soil particles.
(d) Oxygen taken in through stomata reaches the roots.

Ans. (c) : Plant roots obtain oxygen from the air spaces present between the soil particles.

9. All of the following plants have fibrous roots except.

(a) Rice (b) Wheat
(c) Beetroot (d) Maize.

Ans. (c) : Tap root has are main root. This land as the length increases inside. Many branches emerge from them.
Like:- Beetroot, peas, Neem, Mango
Fibrous roots:- Some plants have no taproot. These have many fiber like roots. These are called fibrous root. These roots spread everywhere in the soil.
Like :- Wheat, Maize**,** Rice.

10. The leaves of the plant contain methanoic acid.

(a) Tamarind (b) Orange
(c) Tomato (d) Nettle

Ans. (d) : Nettle leaves contain methanoic acid (also known as formic acid), which is responsible for the stinging sensation when touched. The tiny hairs on the nettle leaves act like needles, injecting the methanoic acid into the skin, causing irritation and burning sensation. This defense mechanism protects the plant from being eaten by herbivores.

11. After fertilization, what happens to the flower organ stamen, style, stigma, petal and sepals?

(a) They fall off except the sepals which may be permanent in some plants.
(b) A part from the stamens, sepals and sepals, stigmas and stigmas fall off.
(c) In some plants apart from the petals and sepals the stigma and stamens fall off.
(d) In most plants except the loss of sepals all are permanent.

Ans. (a) : After fertilization, these parts of the flower – stamen style, stigma and sepal are fall of except the sepal which may be permanent in some plant. After fertilization the zygote undergoes several divisions and an embryo develops in the ovule. A hard cover develops from the ovule and it turns into a seed. The ovary grows rapidly and matures and forms fruits.

12. Which products are transported from leaves and roots by the plant transport system?

(a) Only water.
(b) Only carbohydrates
(c) Energy reserves and raw materials.
(d) Carbohydrates and minerals.

Ans. (c) : Energy stores and raw materials and transport from leaves and roots by the plant transport system. In plants, water and minerals are transported by two types of conducting tissues.
(I) Xylem tissue.
(II) Phloem tissue.

13. A sticky substances is produced from the stems of some plant which is used in making glue adhesive.
What is the use of this gum for plants?

(a) It helps in transportation of water.
(b) It attracts insect pollinators.
(c) It is a waste product of metabolism.
(d) It has medicinal importance.

Ans. (c) : A sticky substance is produced from the stems of some plants which is used in making glue adhesive. It is a waste product of metabolism typically formed by the breakdown of plant cellulose.

14. Ginger, which is used for cooking and flavoring is a rhizome which is -

(a) Underground stem
(b) Underground root
(c) Aerial stem
(d) Root towards the ground (aerial).

Ans. (a) : Ginger, turmeric, potato are examples of underground stems.

15. Which part of the potato plant do we eat?

(a) Root (b) Seeds
(c) Flower (d) Stem

Ans. (d) : The stem part of the potato plant is used as a vegetable. Potato is produced mostly in China, India rank second in potato production. Potato contains vitamin C, B complex and iron, calcium, manganese, phosphorus elements.

16. Which of the following is not a component of the male reproductive organ of a flower?

(a) Anther (b) Stigma
(c) Filament (d) Pollen.

Ans. (b) : Stigma is not a component of the male reproductive organ of the flower. It is a component of the female reproductive organ of the flower are stigma and ovary. Male reproductive organs of the flower, the major parts are pollen, anther and filament.

17. Which of the following is the female reproductive organ of a flower?

(a) Gynoecium (b) Petal
(c) Stamens (d) External part.

Ans. (a) : Gynoecium is the female reproductive organ in flowering plants. It is composed of one or more carpels, which include the ovary (where ovules are produced), style and stigma (the part that receive pollen).

18. Which of the following parts of a flower develops into a fruit after fertilization?

(a) Gynoecium (b) Ovule
(c) Petal (d) Ovary

Ans. (d) : The Ovary is a wide and swollen part adjacent of the pistil which contains many ovules. After fertilization a fruit is formed from the ovary and a seed is formed from the ovule.

19. Mango plant is a-

(a) Vegetable (b) Bush
(c) Tree (d) None

Ans. (c) : Mango tree a type of tropical fruit tree. Mango trees are classified as large woody plants. That means it is not a vegetable, herb or bush.

20. Leaves do the following to make water useful.

(a) Food (b) Transpiration
(c) Oxygen (d) In all

Ans. (d) : Leaves work in food, transpiration and oxygen etc. to make water useful.

21. Drops of water come out from the leaves in the form of water vapor. This action is called-

(a) Transpiration (b) Photosynthesis
(c) Oxidation (d) None of these

Ans. (a) : The action of water vapor being released from the leaves of plants is called transpiration. It is a process where water absorbed by the root is evaporated from small pores in the leaves known as stomata.

22. The male part of the flower is-

(a) Ovary (b) Petal
(c) Stamens (d) Pistil

Ans. (c) : The male part of the flower is called stamen, which help in reproduction. The part of the stamen where pollen is produced is called anther.

23. The female part of the flower is-

(a) Stamens (b) Pistil
(c) Ovary (d) Petal

Ans. (b) : The female part of the flower in the pistil, which is usually located in the center of the flower and is made up of three parts the stigma, the style and the ovary.

24. Flower which has only stamens and no pistils is called-

(a) Male flower (b) Female flower
(c) Male flower (d) None of these

Ans. (a) : A flower which has only stamens and no pistils is called male flower.

25. Flower in which both stamens and pistils are present-

(a) Manosexual
(b) Bisexual flowers
(c) Monocotyledonous flowers
(d) None of these

Ans. (b) : A flower in which both stamens and pistils are present is called bisexual flower.

26. How many parts does a complete flower have?

(a) Two (b) Three
(c) Four (d) Five

Ans. (c) : A complete flower has four parts.
(i) Sepal mass (ii) Corolla
(iii) Stamens (iv) Gynoecium.

27. Plants make their own food by the following process-

(a) Respiration (b) Photosynthesis
(c) Stimulation (d) Excretion

Ans. (b) : Plants make their own food by the process of photosynthesis.

28. The leaves of which of the following plants suddenly shrink on touching-

(a) Rose (b) Mimosa pudica
(c) Hibiscus (d) Henna

Ans. (b) : The leaves of Mimosa pudica plant suddenly shrink when touched. It has seismonastic movement.

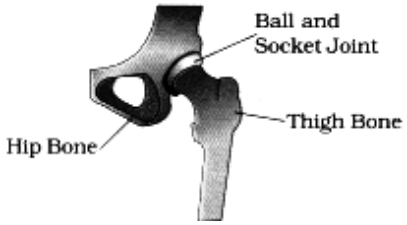
Chapter-5 Body Movements

- There are so many movements that happen in our bodies. Different parts of our body move while we remain at the same place. We walk, run, skip, jump and move from place to place.

Human Body and its Movements

- Where two parts of our body seem to be joined together - like elbow, shoulder or neck. These places are called joints.
- Bones cannot be bent. There are many bones present in each part of the body. We can bend or move our body only at those points where bones meet.
- There are different types of joints in our body to help us carry out different movements and activities.

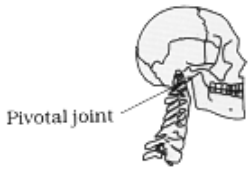
Ball and Socket Joints



A ball and socket joint

- The bowl is like the part of the shoulder to which your arm is joined. The rounded end of one bone fits into the cavity (hallow space) of the other bone. Such a joint allows movements in all directions.

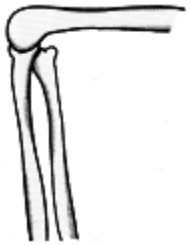
Pivotal Joint



Pivotal joint

- The joint where our neck joins the head is a pivotal joint. It allows us to bend our head forward and backward and turn the head to our right or left.

Hinge Joints

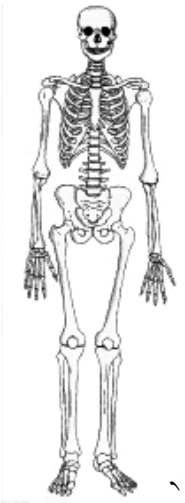


Hinge joints of the knee

- Hinge joints function by allowing flexion and extension in one plane with small degree of motion in other planes.
- The elbow has a hinge joint that allows only a back and forth movement.

Fixed joints

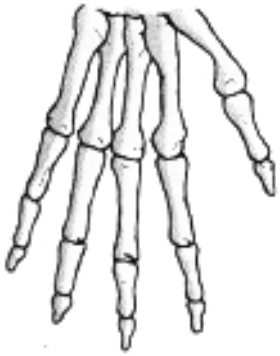
- The bones cannot move at these joints. Such joints are called fixed joints.
- There is a joint between the upper jaw and the rest of the head which is a fixed joint.
- This framework is called the skeleton.
- All the bones in our body form a framework to give a shape to our body.
- The human skeleton is composed of around 305 bones at birth. The number of bones in the skeleton changes with age. It decreases to 206 bones by adulthood after some bones have fused together.



Human Skeleton

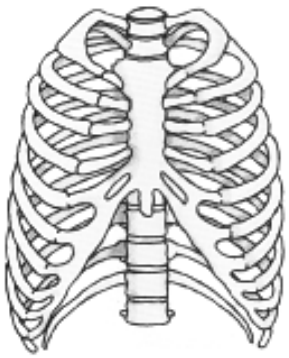
Bones of the hand

- The back of your palm, it is made up of several small bones called carples.



Bones of the hand

- The ribs are curiously bent. They join the chest bone and the backbone together to form a box. This is called the rib cage. There are 12 ribs on each side of chest.



The rib cage

- Starting from the neck, move downwards on the back is the backbone. It is made up of many small bones called vertebrae. The backbone consists of 33 vertebrae. The rib cage is joined to these bones.

The backbone

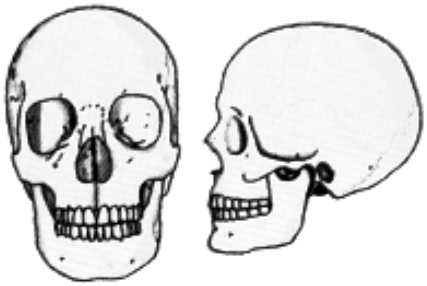
- The shoulder is made up of 3 bones: the scapula, clavicle and humerus. They are called shoulder bones.

Shoulder bones

- The pelvic bone also known as the hip bone or innominate bone, is a large, sturdy bone located in the lower part of the trunk. They enclose the portion of your body below the stomach.

Pelvic bones

- The skull is made up of many bones joined together. It encloses and protects a very important part of the body, the brain.

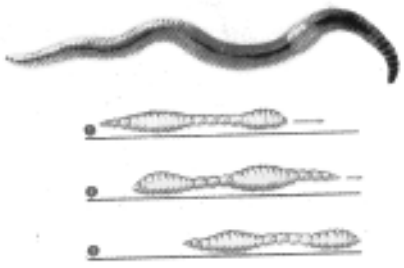


The skull

- There are some additional parts of the skeleton that are not as hard as the bones and which can be bent. These are called cartilage.

Gait of Animals

- **Earthworm**
- The body of an earthworm is made up of many rings joined end to end.
- During movement, the earthworm first extends the front part of the body, keeping the rear portion fixed to the ground. Then it fixes the front end and releases the rear end. It then shortens the body and pulls the rear end forward. This makes it move forward by a small distance.



Movement of earthworm

Snail

- The shell is the outer skeleton of the snail, but is not made of bones. The shell is a single unit and does not help in moving from place to place. It has to be dragged along.

Cockroach

Cockroach

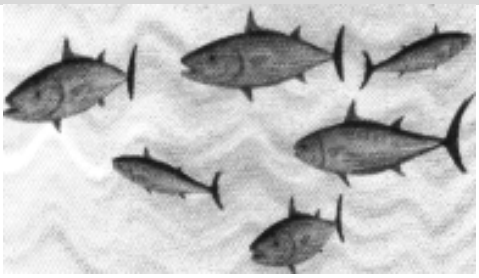
- Cockroaches walk and climb as well as fly in the air. They have three pairs of legs. These help in walking. The body is covered with a hard outer skeleton.
- This outer skeleton is made of number of plates joined together and that permits movement.
- There are two pairs of wings attached to the body behind head.

Birds

- Birds fly in the air and walk on the ground. Some birds like ducks and swans also swim in water.
- The birds can fly because their bodies are well suited for flying. Their bones are hollow and light.
- The bony parts of the forelimbs are modified as wings.

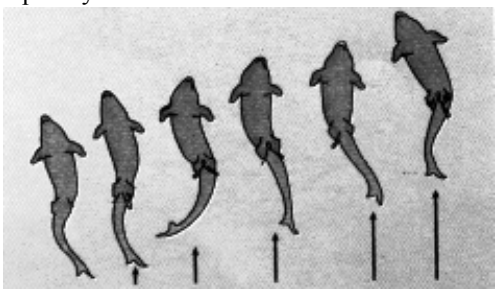
Skeleton of a bird

Fish



Fish

- The head and tail of the fish are smaller than the middle portion of the body- the body tapers at both ends. This body shape is called streamlined.
- The shape is such that water can flow around it easily and allow the fish to move in water. During swimming, muscles make the front part of the body curve to one side and the tail part swings towards the opposite side. The fish forms a curve.
- This makes a jerk and pushes the body forward. A series of such jerks make the fish swim ahead. This is helped by the fins of the tail.



Movement in Fish

Snakes

Movement in a snake

- The snake's body curves into many loops. Each loop of the snake gives it a forward push by pressing against the ground. Since its long body makes many loops and each loop gives it this push, the snake moves forward very fast and not in a straight line.

Important Questions

1. Which of the following muscles are found in blood vessels?

(a) Smooth muscles
(b) Skeletal muscles
(c) Cardiac muscles
(d) Smooth and striated muscles

Ans. (a) : Smooth muscles are non – striated muscles. These muscles are also called involuntary. These muscles do not work as per our wish and smooth muscles are found on the walls of our internal organs. Smooth muscles are found in our blood vessels. A part from this, smooth muscles are also found on the wall of the uterus of women. Cardiac muscles are involuntary muscles.

2. Which of the following is not a flying muscle?

(a) Pectoral muscle
(b) Coracobrachialis longus
(c) Gastrocnemius
(d) Tensor longus

Ans. (c) : Gastrocnemius is not a flying muscle. Three types of flying muscles are found in bird. The pectoral muscle, the coracobrachialis longus muscle and tensor muscle. Birds fly primarily by the large pectoralis muscle which depresses the wings at the shoulder and provides the powerful wing stroke necessary for flight. The coracobrachialis longus is an accessory muscle that helps raise and lower the wing during flight. The tensor longus muscle keeps the propatagium propped up during flight.

3. The wall of an artery is thicker than the wall of a vein. Because artery is -

(a) A thick layer of striated muscles.
(b) A thick layer of smooth muscles.
(c) Alternating layers of smooth and striated muscles.
(d) A thick layer of connective tissue.

Ans. (b) : The wall of an artery is thicker than the wall of a vein because the artery is made of a thick layer of smooth muscle. Internal valve is absent in artery.

4. The arrangement of microtubules in the axon of the eukaryotic cell is called 9+2 system.

(a) Cilia (b) Flagella
(c) Both (d) None

Ans. (c) : Study of a cilia or flagella shows that they are covered with plasma membrane. Their core is called the axon. It contains many microtubules that run parallel to the long axis. The axon usually consists of nine pairs of radially arranged peripheral microtubules and one pair of centrally located microtubules. Such arrangement of axial microtubules is called 9+2 system.

5. Ossein protein is found in -

(a) In the matrix of bone
(b) In the nerve base
(c) In the matrix of cartilage
(d) In the base of tendon

Ans. (a) : Ossein protein is a protein found in the matrix of bones in the human body. It is made up of about 95% collagen. It is separated from the bones by treating them with hydrochloric acid. Collagen in it apart from this many, acidic protein containing components are present in the form of trace elements.

6. Haversian mechanism is characterized by -

(a) of the bones of vertebrates
(b) Bones of birds and mammals
(c) Only bones of mammals
(d) Cartilages of mammals

Ans. (c) : Haversian system is characteristic of the bones of mammals only. The structure of the bones of mammalian organisms is very strong, dense and complex, hence many tubes are formed in their matrix for blood supply. Which are called haversian tubes.

7. In the mesentery region where action and myosin filaments overlap, how many of the following numbers of action filaments surround each myosin filament?

(a) 3 (b) 6
(c) 9 (d) 12

Ans. (b) : In the sarcomere, where actin and myosin filaments overlap 6 actin filaments surround each myosin filament. Actin and myosin form protein filaments which extend longitudinally across myofibrils are arranged from myosin and actin control the movement of voluntary muscles in the human body.

8. Keratinocytes are found in -

(a) Kidney (b) Skin
(c) Lungs (d) Brain

Ans. (b) : Keratinocyte cells are found in the skin. These develop from the stratum corneum. These are the executors of the predominant cell – epithelialization process. As the predominant cell type of human skin, it plays an important role in important immune functions such as wound healing, in the skin. It plays an important role in providing structure to the skin and in the functioning of the immune system.

9. Sarcosomes are:-

(a) Muscle fibers
(b) Muscle mitochondria
(c) Muscle protein
(d) Myofibrils

Ans. (b) : Sarcosomes are specialized mitochondria found in muscle cells. They play a crucial role in providing the energy required for muscle contraction by generating ATP through cellular respiration within muscle fibres.

10. What are myofibrils made of:-

(a) Myosin and actin
(b) Myosin and troponin
(c) Actin and tropomyosin
(d) All the above components

Ans. (d) : Myofibrils are made up of myosin, actin, tropomyosin and troponin. Myofibrils are organization of protein filaments that contain the contractile element of the cardiomyocyte that is the machinery or motor that drives contraction and relaxation. Myofibrils are composed of thick and thin myofilaments thick filaments are composed of myosin and thin filaments are composed of actin, troponin and tropomyosin.

11. Blood vessels are lined internally:-

(a) Squamous epithelium
(b) Columnar epithelium
(c) Sensory epithelium
(d) Ciliated epithelium

Ans. (a) : Blood vessels are internally lined by squamous epithelium. This type of epithelium usually has protective functions, including protection from microorganisms that invade the underlying tissue and protection from damage by water.

12. The cation required in the final muscle contraction is

(a) Ca^{++} (b) Na^{+}
(c) Mg^{++} (d) Fe^{++}

Ans. (a) : The cation required in the final muscle contraction is Ca^{++}. The action potential causes the release of cations from the sarcoplasmic reticulum, which bind to troponin on actin filaments and expose myosin binding sites causing conformational change.

13. Melanin is secreted by:-
(a) Erythroblasts of blood
(b) Chromatophores of skin
(c) Cells of sensory nerves
(d) Ganglia of sensory nerves

Ans. (b) : Melanin is secreted by chromatophores of the skin. Melanin is a substance in the body that produces pigmentation of hair, eyes and skin.

14. Troponin is a:-
(a) Muscle protein
(b) Digestive enzymes
(c) High energy storage
(d) Water soluble vitamins

Ans. (a) : Troponin is a muscle protein. Troponin is a sarcomeric Ca^{++} regulator of striated (skeletal and cardiac) muscle contraction.

15. The muscles around the pupil of the human eye are:-
(a) Unlined and involuntary
(b) Linear and involuntary
(c) Non-linear and optional
(d) Linear and optional

Ans. (a) : Muscle around the pupil of the human eye it is surrounded by unlined and involuntary muscles. Pupil hole which controls the light entering the eye.

16. Located in striated or striated muscle fibre M line:-
(a) A - band (b) H - band
(c) I - band (d) Z - line

Ans. (b) : M – lines are found in the H – zone of striated muscle each myofibril has black and white stripes. The white bands are called Isotropic bands or I – bands There are also alternating black plates in between the white plates, which are called A – band. There is a line right in the middle of each white plates which is called hensen's line or H – band.

17. The functional unit of muscle contraction is:-
(a) A - band (b) Myofibril
(c) Sarcomere (d) Myofiber

Ans. (c) : Sarcomere is the functional unit of muscle contraction. Each sarcomere has myosin rods spanning 2/3 of its length. During relaxation, the bridges connecting the actin and Myosin rods open. Therefore, all the actin rods of each muscle segment return to their normal position. Thus, sarcomeres are the structural and functional unit of muscle fibers.

18. Creatine phosphate is found in -
(a) In epithelial tissues (b) In nervous tissues
(c) In muscle tissue (d) In bone marrow

Ans. (c) : Creatine phosphate is found in muscle tissue creatine phosphate is a phosphorylated form of creatine that serves as a reserve store of high – energy phosphate in skeletal muscle.

19. The innermost surface of the epidermis in the skin is -
(a) Stratum Corneum (b) Stratum malpighi
(c) Stratum spinosum (d) Stratum Lucidum

Ans. (b) : The innermost surface of the ectoderm in the skin is the stratum malpighi. It is also called stratum basale. The cells are cubic or columnar in shape. It protects the skin from pathogen and prevents excessive water loss.

20. The length of muscle does not change.
(a) In isotonic contraction
(b) In isometric contraction
(c) In tetanic contraction
(d) In rapid contraction

Ans. (b) : The length of the muscle does not change in isometric contraction. Isometric contraction is also called static exercise. Under this the muscles are warmed up but there is no change in the length of the muscles during this contraction.

21. Quadriceps and gastrocnemius muscles are present.
(a) In hands (b) In the legs
(c) In the shoulder (d) In the wrist

Ans. (b) : Quadriceps and gastrocnemius muscles are found in the legs. The quadriceps is a hip flexor and knee extensor, consisting of four muscles (three vastus and the rectus femoris.) This gastrocnemius muscle is located on the back of the lower leg, which forms the calf muscle.

22. Sarcomere is the distances between which two bands.
(a) H - strops (b) Z - straps
(c) A - straps (d) M - straps

Ans. (b) : Sarcomere is the distance between two Z – bands. It the stained muscle, the darken stripes are called 'A' stripes. In each 'A' strip part, thick rods made of protein called myosin and in 'I' strip part. Thin rods of protein called actin are spread parallel to each other in length. These fibers are called myofilaments there is a fibrous and zigzag transverse partition in the middle of the eye strip. Action rods extend on both sides of this plate. This strip is called 'Z' line or kraus's membrane. The part between each two Z lines (a complete 'A' band and halves of the band on either side of it) together form a muscle segment, i.e. sarcomere.

23. Primary structural protein of thin filaments?
(a) Actin (b) Troponin
(c) Tropomyosin (d) All of these

Ans. (d) : Thin filaments are made up of two helically arranged filamentous polymers of the protein tropomyosin that lies in the grooves of the helix as well as an associated globular protein troponin. So option d is correct.

24. Calcium is added to muscles during contraction?
(a) From actin (b) Myosin
(c) Tropomyosin (d) Troponin

Ans. (d) : When the amount of Ca^{++} increases in the sarcoplasm. Ca^{++} binds with the troponin subunit on the actin filament and opens the covered active sites of actin. Using the energy obtained from the hydrolysis of ATP, the myosin heads bind to the open active sites of

actin to from cross bridges causing the sarcomere to shorten or contract In this, the length of the I band is reduced while the A band remains as it is.

25. Working for a long time makes the muscles tired are during muscle fatigue.
(a) Citric acid is formed
(b) Pyruvic acid is formed
(c) Glucose is converted into glycogen
(d) Lactic acid is formed

Ans. (d) : Due to working for too long, our muscles undergo anoxic respiration which results in formation of lactic acid which causes fatigue. Where as pyruvic acid is formed by glycolysis.

26. Which part of the brain controls muscular coordination in mammals?
(a) Cerebrum (b) Cerebellum
(c) Medulla (d) Corpus callosum

Ans. (b) : Cerebellum provides involuntary control and coordination of voluntary muscles in humans. The cerebellum part of a person who drinks alcohol get affected, due to which he is unable to maintain his balance and starts staggering.

27. The ions which are re-pumped into the myoplasmic reticulum during relaxation of muscles are.
(a) Ca^{++} (b) Mg^{++}
(c) K^{+} (d) Mn^{++}

Ans. (a) : In abundance of Ca^{++} actomyosin bridges are formed between myosin and actin in each muscle fiber which works to contact the fibers. As soon as the fibers contract, Ca^{++} is pumped back into the myoplasmic reticulum. Troponin inactivates the actin due to which the bridge bonds open, the actin due to which the bridge bonds open, the actin fragments reach their place and thus the muscle relaxes.

28. The organs of balance in human ears are:-
(a) 3 Semi – circular canals
(b) Eardrum
(c) Cochlea canal
(d) Sacculus

Ans. (a) : The organs of balance in human ears are 3 semi – circular canals. Saculus and cochlea are involved as organs of hearing. The utriculus plays an important role in orientation and balance or especially in horizontal tilt.

29. Which one of the following vertebrate tissues is an excellent source of collagen:-
(a) Liver (b) Muscle
(c) Tendon (d) Nerve

Ans. (c) : The excellent source of collagen in vertebrate tissues is tendon. Collagen is a protein molecule made up of amino acids. They provided structural support to the extracellular space of connective tissues. Due to its toughness and resistance to stretch is the perfect matrix for skin, tendons, bones and ligaments.

30. During impulse transmission, what causes depolarization of the axon phase?
(a) Due to k^{+} coming out at a fast speed.
(b) By going inside k^{+}
(c) Due to entry of Na^{+}
(d) Due to Na^{+} coming out.

Ans. (c) : During impulse transmission, depolarization of the axon phase occurs due to influx of Na^{+}, in this during impulse transmission, the doors of Na^{+} channels are open and the doors of k^{+} channels remain closed and the entry of Na^{+} gate causes depolarization of the nerve membrane or axon membrane.

31. Haversian canals are connected to each other by:-
(a) Schlemm's duct (b) Cloquest's canal
(c) Volkmann's canal (d) Herring's canal

Ans. (c) : Haversian canals found in bones are connected to each other by Volkmann canal. The canal found in the vertebral column of mammals is Cloquet's canal. Schlemm's duct is found in the eyes of mammals. Herring's canal is found in the posterior pituitary gland.

32. Chordae tendineae is a part of:-
(a) Heart (b) Notochord
(c) Tendon (d) Lung

Ans. (a) : Chordae tendineae (tendinous cords) are collectively known as heart strings. The chordae tendineae are strong fibrous connections between the bulbous leaflets and the papillary muscles. These are attached to the leaflets on the ventricular side and prevent the blood from swinging back into the atrial cavity during systole.

33. The bone formed by bone growth of tendon is called.
(a) Art bone (b) Sesamoid bone
(c) Dermal bone (d) Cartilage

Ans. (b) : The bone formed by the bone development of the tendon is called sesamoid bone.
Cartilage:- cartilage like other tissues, originates from the mesoderm of the embryo. Its matrix contains a protein and has a network of white collagen and yellow elastic fibers which provides strength and flexibility to the cartilage.

34. Sesamoid bone is formed by whose modification
(a) Nerves (b) Cartilage
(c) Adipose tissue (d) Tendon

Ans. (d) : Sesamoid bone is formed by modification of tendon. It is a small triangular bone which is located in front of the knee joint. It is formed by calcification of the tendon. Such bone is called sesamoid bone. It is attached to the projections of the femur and is also attached to the tibia bone of the thigh (shank) by an elastic ligament. It helps the knee to bend and protects the joint.

35. Which of the following bones are made up of the three bones of the ear of the breast?
(a) Squamosal, jugal and pterygoid.
(b) Jugal, hyomandibular and articulate

(c) Quadrate, terrygoid and Jugal
(d) Quadrate, articulate and hyomandibular.

Ans. (d) : The ear of the mammal is made up of three bones quadrate, articulate and hyomandibular.
Malleus – Articulate
Incus – Quadrates
Stapes – Hyomandibular.
Each of our middle ears has two small bones attached to each other. There are malleus, incus and stapes respectively from the eardrum towards the inner ear.

36. The function of the tympanic bones present in the middle ear cavity is-
(a) Increasing the frequency
(b) Increasing the amplitude
(c) Increasing the wavelength
(d) All of these.

Ans. (b) : The function of the tympanic bones (also known as the auditory ossicles: Malleus, incus and stapes) in the middle ear cavity is primarily to increase the amplitude of sound vibrations transmitted from the eardrum to the inner ear.

37. The correct order of bones in the middle ear of human is-
(a) SIM (b) IMS
(c) MIS (d) MSI

Ans. (c) : Three bones are found in the middle ear of humans. Which are called MIS in short, their correct sequence is as follows-
Malleus → Incus → steppes.

38. Otolith is found in-
(a) In the stomach s (b) In the inner ear
(c) In bone marrow (d) In the liver

Ans. (b) : Otolith are found in the tympanic membrane of vertebrates. Very small crystals of calcium carbonate are found in the otolith Membrane.Which is called otolith. It helps is maintaining balance in animal.

39. In mammals, the zygomatic arch is formed by:-
(a) Jugal, squamosal and maxilla.
(b) Quadratojugal, terygwide and nasal.
(c) squamosal, palatine and vomer.
(d) Squamosal, maxilla and vower.

Ans. (a) : In mammals the Zygomatic arch is formed by the jugal, Squamosal and maxilla.
The function of the Zygomatic arch is to protect the eye origin of the masseter and temporal muscles, and to provide articulation for the mandible.

40. Fibrous fixed joints are found in whose bones:-
(a) Vertebral column (b) Skull
(c) Girdle (d) Limb

Ans. (b) : Fibrous fixed joints are found in the bones of the skull. Immovable or fibrous joints are those that do not allow movement (or allow only slight movement) at the joint sites.

41. The muscles attached to bones or tendon are:-
(a) Striated muscles (b) Unstriated muscles
(c) Heart muscles (d) Scissor muscles

Ans. (a) : Tendon connects the muscles to the bone. Striated muscles are muscles attached to bones or tendons. Muscles or ligaments connect bones to bones.

42. Osteoblast responsible for-
(a) Bone digestion (b) Bone formation
(c) Bone disease (d) Bone protection

Ans. (b) : Osteoblasts are specialized cells responsible for building new bone tissue. They secrete a matrix that becomes mineralized forming the hard, supportive structures of bones.

43. Which of the following pumps is responsible for initiating muscle contraction through depolarization of the muscle cell membrane?
(a) Na^+ pump (b) K^+ pump
(c) Ca^+ pump (d) Mg^+ pump

Ans. (c) : Ca^+ pump is responsible for initiating contraction in muscles through depolarization of the muscle cell membrane. Where Ca^{++} is released into the muscle from the binding site. Ca^{++} ions accumulate in the sarcoplasmic reticulum surrounding myofibrils. When Ca^{++} ions are released from the sarcoplasmic reticulum into muscle cells, muscle contraction occurs. In contract, relaxing muscle cells require Ca^{++} ions to be pumped back into the sarcoplasmic reticulum.

44. In mammals the coronoid process is a part of:
(a) Axis vertebra (b) Atlas vertebra
(c) Pelvic girdle (d) Lower jaw

Ans. (d) : In mammals, the coronoid process is the part of the lower jaw or mandible.

45. The joint between incus and stapes is:-
(a) Ball and socket joint (b) Hinge joint
(c) Gliding joint (d) Pivot joint

Ans. (a) : The joint between incus and stapes is a ball and socket joint. This type of joint allows for the greatest range of motion, including flexion, extension etc. This is crucial for the transmission of sound vibrations from external ear to the inner ear.

46. The skeletal structure of the body is called.
(a) Skeletal system (b) Muscular system
(c) Digestive system (d) none of these

Ans. (a) : The structure of bones of the body called the skeletal system.

47. The Joint of upper Jaw and skull is-
(a) Movable Joint (b) Immovable Joint
(c) Hinged Joint (d) Pivot Joint

Ans. (b) : The Joint of the upper Jaw and the skull is called the fixed Joint.
There is no movement in it.

48. Which of the following creatures has hallow but strong bones?
(a) Human being (b) Birds
(c) Carnivorous animals (d) Fish

Ans. (b) : The bones of birds are hallow but strong which helps them in flying.

49. Which of the following organisms eats soil-
(a) Snake (b) Fish
(c) Earthworm (d) Lizard

Ans. (c) : Earthworm eats soil and makes the soil fertile, so it is called farmer's friend.

Chapter-6 The Living Organism Characteristics and Habitats

Organisms and the Surroundings Where They Live

- The kinds of living organisms that were present in different locations, for example the deserts had camels, the mountains had goats and yak.

Habitat and Adaptation

Camels in their surroundings

- The presence of specific features or certain habits, which enable an organism to live naturally in a place is called adaptation.
- Adaptation of organisms differ depending on their place of dwelling.
- The place where organisms live is called habitat.
- Habitat means a dwelling place (a home). The habitat provides food, water, air, shelter and other needs to organisms. Several kinds of plants and animals live in the same habitat.
- Some examples of terrestrial habitats are forests, grasslands, deserts, coastal and mountain regions.

Different kinds of fish

- The habitats of plants and animals that live in water are called aquatic habitats. Lakes, rivers and oceans are some examples of aquatic habitats.

Biotic and abiotic components

- The organisms, both plants and animals, living in a habitat are its biotic components.
- The non-living things such as rocks, soil, air and water in the habitat constitute its abiotic components.

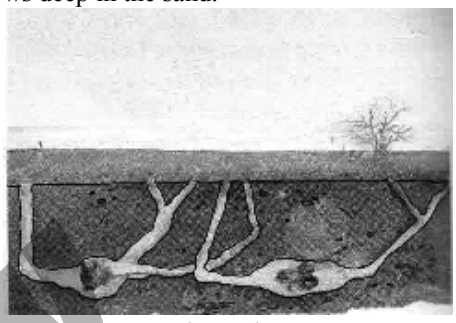
Acclimatization

- Small changes that take place in the body of a single organism over short periods, to overcome small problems due to changes in the surroundings, are called acclimatization.
- Adaptation does not take place in a short time because the abiotic factors of a region also change very slowly. Those organisms which cannot adapt to these changes die and only the adapted ones survive.

Some Terrestrial Habitats

■ **Desert**

- There are desert animals like rats and snakes, which do not have long legs that has a camel. To stay away from the intense heat during the day, they stay in burrows deep in the sand.



Desert animals in burrows

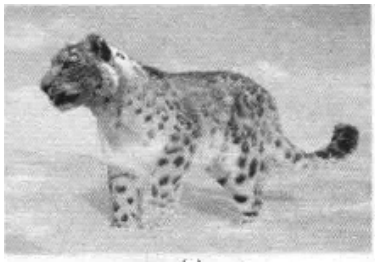
Some typical plants that grow in desert

- Desert plants lose very little water through transpiration. The leaves in desert plants are either absent, very small, or they are in the form of spines.
- Photosynthesis in desert plants is usually carried out by the stems. The stem is also covered with a thick waxy layer, which helps to retain water in the tissues of cacti.

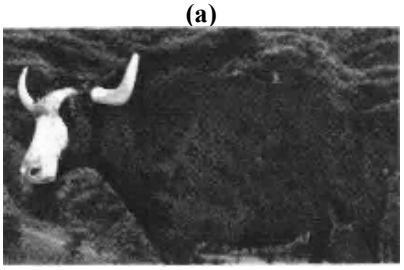
Mountain regions

Trees of a mountain habitat

- Trees are normally cone shaped and have sloping branches. The leaves of some of these trees are needle - like.
- Animals living in the mountain regions are also adapted to the conditions there. They have thick skin or fur to protect them from cold. For example, yaks have long hair to keep them warm.



(a)



(b)

(c)

(a) Snow leopard, (b) yak and (c) mountain goat are adapted to mountain habitats

- **Grasslands**
- A lion lives in a forest or a grassland and is a strong animal that can hunt and kill animals like deer. It is light brown in color. Lions have long claws in their front legs that can be withdrawn inside the toes.

(a)

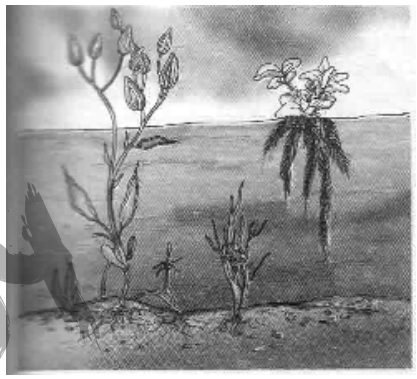
(b)

(a) Lion and (b) deer

- Lion's light brown color helps it to hide in dry grasslands when it hunts for prey (animals to eat). The eyes in front of the face allow it to have a correct idea about the location of its prey.

Some Aquatic Habitats

- **Oceans**
- Many other sea animals have streamlined bodies to help them move easily in water. There are some sea animals like squids and octopus, which do not have this streamlined shape.
- **Ponds and lakes**



Some aquatic plants float on water. Some have their roots fixed in the soil at the bottom. Some aquatic plants are submerged in water

- Some aquatic plants are submerged in water. All parts of such plants are under water. Some of these plants have narrow and thin ribbon-like leaves. These can bend in the flowing water.

Characteristics of Organisms

- Plants and animals found in different surroundings. Trees, creepers, small and big animals, birds, snakes, insects, rocks, soil, water, air, dry leaves, dead animals, mushrooms and moss may be only some of the objects that are present in the forest.
- Objects that you can see around you at this moment and group them as living and non-living.

Need of food for organisms

- All living things need food. Plants make their own food by the process of photosynthesis. Animals depend on plants or other animals for their food.
- Food gives organisms the energy needed for them to grow. Organisms also need energy for other life processes that go on inside them.

Growth in organisms

- Young ones of animals also grow into adults. Some are very small and young, some are bigger. They may all be in different stages of growth. Growth seems to be common to all living things.

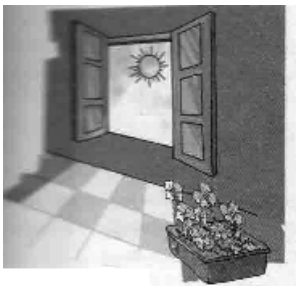
Respiration in organisms

- Respiration is necessary for all living organisms. It is through respiration that the body finally obtains energy from the food it takes.
- In respiration, some of the oxygen of the air we breathe in, is used by the body. We breathe out carbon dioxide produced in this process.

- Some animals may have different mechanisms for the exchange of gases, which is a part of the respiration process. For example, earthworms breathe through their skin. Fish have gills for using oxygen dissolved in water.

Organisms respond to stimuli

- Anything that causes a living organism to react is called a stimulus. All living organisms respond to their environment. Response to stimuli is an important characteristic of life.



Plants respond to light

- All living things respond to changes around them.

Excretion in organisms

- All organisms need food. Not all the food that is eaten is completely used, only a part of it is utilised by the body.
- Excretion has to be removed from the body as wastes. Our body produces some wastes in other life processes also. The process of getting rid of wastes by organisms is known as excretion.
- Excretion is another characteristic common to all organisms.

Reproduction in organisms

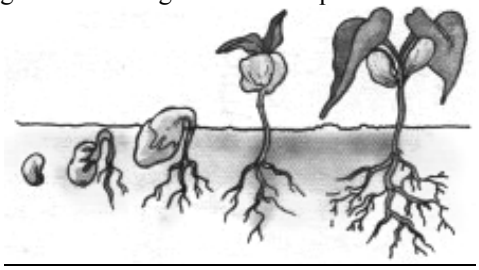
- Many birds lay their eggs in the nest. Some of the eggs hatch and young birds come out of them.

(a) Birds lay eggs which after hatching produce (b) young ones

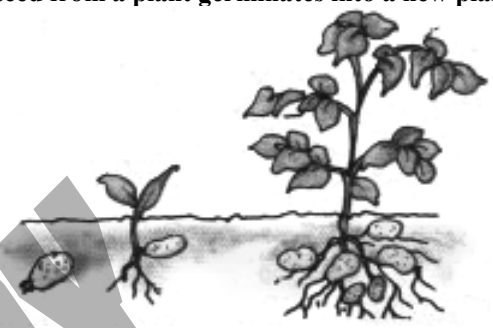
- Animals reproduce their own kind. The mode of reproduction may be different, in different animals. Some animals produce their young ones through eggs. Some animals give birth to the young ones.

Some animals which give birth to their young ones

- Plants also reproduce. Plants produce seeds, which can germinate and grow into new plants.



A seed from a plant germinates into a new plant



A new plant grows from a bud of potato

- Plants also reproduce through cuttings. Living things produce more of their own kind through reproduction. It takes place in many different ways, for different organisms.

Movement in organisms

- All living things seem to have some common characteristics. They all need food, respire, respond to stimuli, reproduce, show movement, grow and die. Animal move from one place to another and also show other body movement.
- In general, something that is living may have all the characteristics discussed, while non-living things may not show all these characteristics at the same time.

Important Questions

1. Which of the following materials is not used in building houses?

(a) Cement (b) Iron
(c) Stone (d) Scooter

Ans. (d) : Cement, iron and stone are building materials while scooter is a means of transportation.

2. The houses of monkey, lion and mouse are respectively.

(a) Nest, tree and cave
(b) Cave, hole and tree
(c) Tree cave and burrow
(d) Bill, tree and cave

Ans. (c) : The habitat of a monkey is a tree, the habitat of a lion is a cave and the habitat of a mouse is a burrow.

3. Which of the following birds does not build its own nest?

(a) Crow (b) Cuckoo
(c) Sparrow (d) Nightingale

Ans. (b) : Cuckoo is a bird which does not build its own nest. She lays eggs in the crow's nest. The crow also incubates the cuckoo's eggs along with its own eggs.

4. The two creatures are good friends and live together. One of these provides shelter, water and nutrients, while the other produces and provides food. This type of relationship of living beings is called-

(a) Self - nutrition (b) Parasitism
(c) Heteronutrition (d) Symbiosis

Ans. (d) : When two organisms live together, one of them provides shelter and nutrients while the other produces and provides food, then this type of relationship is called symbiosis The best example of symbiosis is lichen. In lichen, an alga and a fungus live closely together. The fungus continues to get food made from algae and in return it receives mineral salts, space and protection from the fungus.

5. Are symbiotic plants formed by mutual cooperation of algae and fungi.

(a) Funeraria (b) Lichen
(c) Marchantia (d) Riccia

Ans. (b) : Plants formed by symbiotic interaction of algae and fungi are lichens. In this, algae perform the function of producing food while fungi provide habitat. Riccia, Marchantia and the funaria are bryophyta.

6. Select the set that represent only the biological components of a habitat:

(a) Bear, turtle, crab, rocks.
(b) Insects, frogs, fish, aquatic plants.
(c) Tiger, deer, grass, soil.
(d) Insects, water, aquatic plant, fish.

Ans. (b) : Insects, frogs, fish, aquatic plants etc. organisms reside in biological components. Where as the abiotic component includes non-living things. Such as sunlight, oxygen, nitrogen, other gases, water soil, minerals etc.

7. Which of the following statements is true regarding endemic species?

(a) The destruction of their habitat has no effect on them.
(b) It is found only in zoos and botanical gardens.
(c) It is found only is specific habitats.
(d) Special regional species can never become endangered.

Ans. (c) : Regional species (endemic species) are those species of organisms, which are found in specific area. They do not exist anywhere else in the world. For example, there is a one-horned rhinoceros found in Kaziranga national park of Assam, which is a regional species of India.

8. The place where small animals like termites, flies, earthworm etc. are reared according to their nature is called.

(a) Aquatic aquarium (b) Museum
(c) Terrarium (d) Forest

Ans. (c) : Animals like termites, flies and earthworms are reared in terrarium. In aquarium, aquatic creatures like fish are reared in museum, dead bodies or organs of various creatures are kept in forest, all the creatures are found in their natural habitat.

9. Purva is included in which settlement?

(a) Rural (b) Linear
(c) Urban (d) Disintegrated

Ans. (a) : Purva is included in the rural settlement. Apart from this, villages and farmsteads also come under rural settlements. Purva settlements live dispersedly in many small units in villages. These settlements are generally found in West Bengal, Eastern Uttar Pradesh, Madhya Pradesh and coastal plains.

10. Which of the following birds makes its nest among the thorns of the catcus plant?

(a) Dove (b) Sugar - eater
(c) Baya (d) kalchidi

Ans. (a) : The dove makes its nest among the thorns of cactus plants or in the stalks of rosemary. The sugar-eater makes its hanging nest on the branch of a small tree or bush.

11. Which of the following insects does not live together in a colony like bees?

(a) Wasp (b) Ant
(c) Termites (d) Spider

Ans. (d) : Spiders do not live together in colonies like bees. Where as a wasp, an ant and a termite live collectively in a colony.

12. Consider the following characteristics of houses.

(A) No window in the lower floor.
(B) Sloping roofs made of wood from tree trunks.
(C) Houses built on stone pillars at a height of about 10-12 feet from the ground.
(D) Thick wall made of stone, mortar and lime.
(E) Wooden floors.

Which of the above mentioned features can be found the houses of Leh and ladakh?

(a) B, C, D (b) C, D, A
(c) A, D, E (d) A, B, C

Ans. (c) : Leh and Ladakh are located in the Kashmir state of India, where is extreme cold and snowfall. The houses here are built to suit the weather. The characteristics of the houses here.
1. Absence of windows in the lower floors of houses.
2. Thick wall made of stone mortar and lime.
3. Wooden floors.

13. Study the following.

The crow makes its nest on a high branch of a tree. A variety of materials are use to make this nest, even wooden branches and iron wire. These is also a clever bird which does not make its own nest and lays its eggs in the crow's nest. The poor crow incubates these eggs along with its own. Which bird is this?

(a) kalchidi (b) Basant gauri
(c) Cuckoo (d) More

Ans. (c) : The cuckoo does not make its own nest. The cuckoo lays its eggs in the crow's nest. The crow considers the cuckoo's egg as its own and incubates it. So that, cuckoo is also known as brood parasits.

14. Eskimos build their houses 'igloo' from snow. What is the reason for this?
(a) Snow does not allow cold air and water to enter.
(b) The air present between the wall of ice prevents the heat inside from going out.
(c) Ice is available for free, other materials will coast more.
(d) Only ice is available in Polar Regions.

Ans. (b) : Eskimos are tribes living in polar regions who build their houses from snow. Their houses are called igloos. Eskimos build houses out of snow because the air present between the walls of snow prevents the heat inside from going out, due to which the house feels worm.

15. A bird makes its nest on a high branch of a tree It could be a bird.
(a) Sugar - eater (b) Kalchidi
(c) Crow (d) Dove

Ans. (c) : The crow builds its nest on a high branch of a tree. Sugar - eater (also known as humming birds or sunbirds) typically nest in shrubs or vines, not high branches.
Doves often nest on lower branches, ledges or even the ground.

16. In rural area, the wall and floors of huts are plastered with cow dung.
(a) To keep away insects.
(b) To make smooth and clean.
(c) To increase friction by making it rough.
(d) To give natural color to the floor.

Ans. (a) : In rural areas, the floor and wall of the hut are plastered with cow dung to protect the wall from insects.

17. Which of the following is non-living-
(a) Cow (b) Horse
(c) Trees and plants (d) Train

Ans. (d) : The train is non living, all other organisms like cow, horse and plants are living beings.

18. Which of the following is living-
(a) Chair (b) Table
(c) Stone (d) Seeds

Ans. (d) : The seed is living, the rest, chairs, table and stone are all non-living.

19. The main characteristics of living beings are not-
(a) Respiration (b) Reproduction
(c) Growth (d) Stability

Ans. (d) : Stability is not a characteristic of living being, all the rest respiration, growth and reproduction are characteristics of living beings.

Chapter-7 Measurement of Motion and Distances

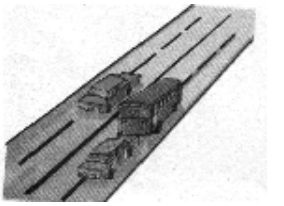
Standard Units of Measurements

- Scientists all over the world have accepted a set of standard units of measurement. The system of units now used is known as the International System of Units (SI units).
- The SI unit of length is a metre. Each metre (m) is divided into 100 equal divisions, called centimetre (cm). Each centimetre has ten equal divisions, called millimetre (mm). Thus,
  1m = 100 cm
  1 cm = 10 mm
- For measuring large distances, metre is not a convenient unit. We define a larger unit of length. It is called kilometre (km).
  1 km = 1000m

A metre scale and a 15 cm scale

Types of Motion

- The objects move along a straight line, this type of motion is called rectilinear motion.



Some examples of rectilinear motion

- The distance of the stone from your hand remains the same. This type of motion is called circular motion.

Some objects in circular motion

- The motion of a point marked on the blade of an electric fan or the hands of a clock are examples of circular motion.
- An object repeats its motion after some time. This type of motion is called periodic motion.

Examples of periodic motion

- Motion is a change in the position of an object with time. The change in this position can be determined through distance measurements. This allows us to know how fast or slow a motion is.

Important Questions

1. It is a physical quantity which can not be negative.

(a) Distance (b) Force
(c) Acceleration (d) Velocity

Ans. (a) : Distance is a scalar quantity which is never negative, where as force, acceleration and velocity are vector quantities whose values can be positive, negative and zero.

2. _____ is used to describe the overall motion of an object and find its final position with respect to its initial position at a given time.

(a) Distance and speed
(b) Velocity and speed
(c) Distance and displacement
(d) Displacement and velocity

Ans. (b) : Displacement describes the change in position of an object, while velocity indicates the rate of change of displacement with respect to time. Together, they provide a comprehensive description of an objects motion and its final position relative to its initial position.

3. The product of velocity and time gives:-

(a) Distance (b) Displacement
(c) Momentum (d) Speed

Ans. (b) : The product of velocity and time is called displacement. The perpendicular distance traveled by an object between two point in a certain direction is called displacement. This is a vector quantity. Its S.I. the unit is meter.

4. If the distance traveled by an object is zero then what will be the displacement of the object?

(a) Negative
(b) Zero
(c) Positive
(d) May or may not be zero.

Ans. (b) : Displacement of an object is the minimum distance between the final position of the object and the initial position. Since the distance traveled by the object is zero, the minimum distance between the final position and the initial position of the object will also be zero, hence the total displacement of the object will also be zero.

5. An object is thrown upwards. It goes up to a hight of 100 meters and then comes back to the thrower, so

(a) Actual displacement of the object is 50m
(b) The total distance traveled by the object is zero.
(c) Actual displacement of the object is 100m
(d) Actual displacement of the object is zero.

Ans. (d) : When an object moves through and path from one point P to another point O, then the magnitude of this displacement will be the minimum distance between those two points. Displacement is a vector quantity. When an object is thrown upward, it reaches a height of 100 meter and then comes back to the thrower then the actual displacement of the object is zero.

Chapter-8 Light, Shadows and Reflections

- Light helps us see objects, without light, things cannot be seen.

Luminous Objects

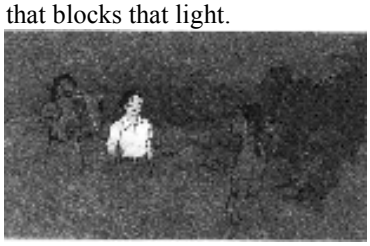
- Objects like the sun that give out or emit light of their own are called luminous objects.

Transparent, Opaque and translucent objects

- If we cannot see through an object at all, it is an opaque object. If you are able to see clearly through an object, it is allowing light to pass through it and is transparent. There are some objects through which we can see, but not very clearly, such objects are known as translucent.

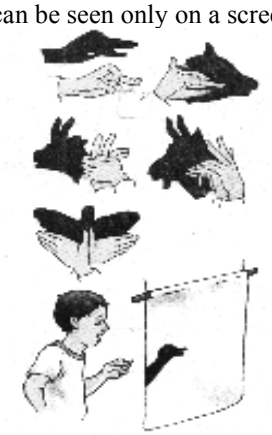
Observing objects that do or do not allow light to pass through them

- To see a shadow, there must be a source of light and an object that blocks that light.



A shadow is obtained only on a screen

- The shadow can be seen only on a screen.

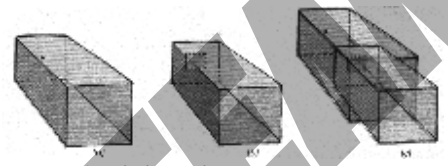


Shadows of animals hidden in your hand

- Shadows give us some information about shapes of objects. Sometimes, shadows can also mislead us about the shape of the object.

A pinhole Camera

- The pinhole camera is the simplest kind of camera, that does not have a lens.

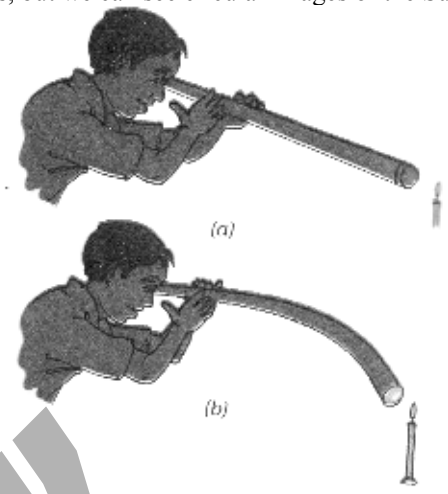


A sliding pin hole camera

- There is an interesting pinhole camera in nature. Sometimes, when we pass under a tree covered with large number of leaves, we notice small patches of sunlight under it.

Natural pinhole camera. Pinhole images of the Sun under a tree!

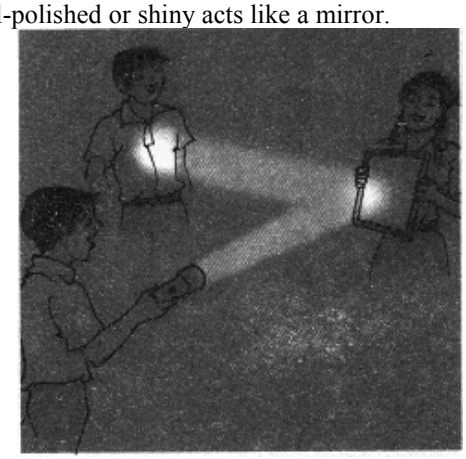
- These circular images are, in fact, pinhole images of the Sun. The gaps between the leaves, act as the pinholes. These gaps are all kinds of irregular shapes, but we can see circular images of the Sun.



Looking through a pipe pointed (a) towards and (b) a little away from a candle

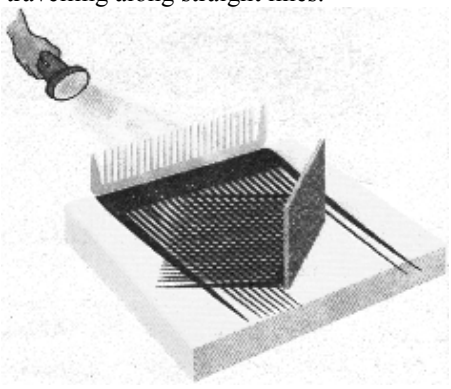
Mirrors and Reflections

- A smooth shiny, surface of glass which reflects light is called a mirror.
- Mirror reflection is the phenomenon when light reflects off of surfaces. Any surface that is really well-polished or shiny acts like a mirror.



A mirror reflects a beam of light

- Light travelling along straight lines.



Light travelling in a straight line and getting reflected from a mirror