

# Teacher's Manual

Carvaan

# Science

Preparatory Stage  
Class  
**4**



MASTERMIND

**Chapter 1 : Adaptation in Plants**

- A.** 1. (a) 2. (c) 3. (b) 4. (c) 5. (b)
- B.** 1. water 2. food 3. Coconut, teak 4. cold, snowfall
- C.** 1. T 2. F 3. T 4. F
- D.** 1. A lotus plant cannot grow in desert because it is a fixed aquatic plant and need amount of water to grow and desert is a dry area.
2. Because they clean the water by removing carbon dioxide breathed out by aquatic animals. This is why we put it in aquariums.
3. Plants of the grass family have a fibrous root system. Fibrous roots spread through the soil and help to hold the soil more firmly than tap roots.
4. Underwater plants have thin, ribbon-like narrow leaves. There is no stomata in their leaves. They breathe through their body surface.
- E.** 1. Plants that grow on land are called terrestrial plants. Mango tree, peepal tree and rose plant are terrestrial plants.
2. Plants that are live under the water are called underwater plants. They are completely submerged in water. Their roots are fixed to the soil or the bottom of shallow ponds and rivers. There is no stomata in their leaves. They breathe through their body surface.
3. Plants that grow in soil which is poor in minerals. They derive most of their nutrition by trapping the insects and consuming the insects. Such plants are called insectivorous plants.
- (i) Bamboo plants are actually giant grass. It is used for making brooms, baskets, mats, chairs, etc.
- (ii) Some dried grass is used as packing materials.
- (iii) The roots of some plants hold the soil and help to conserve the soil.
- (iv) Some plants of the grass family are used in preparing medicines.

**Chapter 2 : Food Process in Plants**

- A.** 1. (b) 2. (a) 3. (b) 4. (c) 5. (a)
- B.** 1. Carbon dioxide, oxygen 2. stomata 3. food 4. Cells
- C.** 1. F 2. F 3. T 4. T 5. F
- D.** 1. Because Sun provides the initial energy that starts the cycle of photosynthesis. The energy from light causes a chemical reaction that breaks down the molecules of carbon dioxide and water and reorganizes them to make the sugar and oxygen gas.
2. Leaves are green in colour due to a substance called chlorophyll.

3. Because they do not have chlorophyll. They cannot make their own food. They get their food from dead plants and animals.
  4. Because they make food for the plant through the process of photosynthesis.
- E.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- F.** 1. The functions performed by a leaf are :
- (i) Leaf prepares food for the plant.
  - (ii) Leaf helps the plant to breathe through stomata.
  - (iii) Some leaves also store food prepared by the plant.
2. Extra food is changed into a substance called starch and it stored in different parts of plant such as fruits, leaves, stems and roots.
  3. Nature keeps a balance between all the living things on the Earth. Plants use carbon dioxide that animals breathe out. Dead animals put some minerals back into soil. Animals eat up plants and prevent them from growing wild. That is why it is essential to maintain a balance between plants and animals in nature.

### **Chapter 3 : Reproduction in Plants**

- A.** 1. (a) 2. (c) 3. (a) 4. (b) 5. (a)
- B.** 1. seeds 2. fertilization 3. stigma 4. dark
- C.** 1. T 2. F 3. T 4. T 5. T
- D.** 1. Most plants germinate more quickly in the dark because the presence of light tends to inhibit their growth. In dark environments, the gases remain undisturbed and germination is favoured.
2. Because plants cannot walk around and take their seeds to other places, they have developed other methods to disperse their seeds. The most common methods are wind, water, animals, explosion and fire.
- E.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- F.** 1. All living beings like plants, animals and human beings are able to produce their own kinds. This process of producing one's own kind from their parents is called reproduction. Plants reproduce through roots, stem, leaves, stem cutting and seeds.
2. A seed needs proper air, water, temperature and light for germination.
  3. Wind, water, animals and explosion are the various ways of dispersal of seeds.
  4. Potato and ginger grow through the stem. They are underground stem.

Potato has tiny buds which grow into new potato plants. The buds of ginger also given rise to new ginger plants.

- G.** 1. The transference of pollen from the anthers to the stigma of a flower is called pollination.
2. Grafting is a method in which stems of superior quality plants are attached to the stems of ordinary plants to produce superior varieties.
3. Some plants like molds, mushrooms, mosses and ferns produce very tiny seed like structures called spores.

#### **Chapter 4 : Adaptation in Animals**

**A.** 1. (c) 2. (a) 3. (b) 4. (b) 5. (a)

**B.** 1. arctic foxes, polar bears 2. Frogs 3. Bird, butterflies 4. Herbivores  
5. Arboreal

**C.** 1. T 2. T 3. T 4. F 5. T 6. T

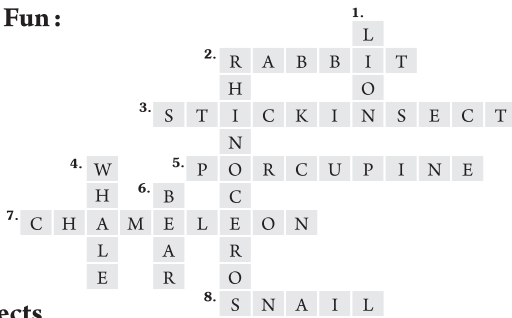
**D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)

**E.** 1. Dog 2. Fish 3. Frog 4. Bird 5. Snake

- F.** 1. The process of changing to suit the environment is called adaptation. There is a variety of habitats on the Earth. Animals can therefore be classified as terrestrial, aquatic, amphibian, aerial and arboreal based on their habitat.
2. Aquatic animal lives only in water and dies if it comes in contact with land but amphibians are animals which can live both in water and land. Fish is aquatic animal and frog is amphibian animal.
3. The body colour of some animals like chameleon, parakeet, polar bear etc. have the ability to easily blend with their surroundings. They confuse their enemies and escape from them.
4. They have strong arms and legs to climb on trees. The spines or plates on their bodies prevent from slipping while climbing. They have claws and broad hip girdles to support their body while climbing. Their fingers and thumb are shaped in such a way that they can hold the branches firmly. Monkeys use their tails to grip branches and hang down for swinging.
5. They have long and strong legs to roam long distances in search of food.
6. Animals that live either on or inside the bodies of other animals to obtain food, are called parasites. Mosquitoes, leeches, hookworms and bed bugs are parasites.

- G. 1. Carnivores 2. Herbivores 3. Parasites 4. Omnivores 5. Arboreal  
6. Aquatic 7. Terrestrial 8. Aerial 9. Terrestrial

**Let's Have Fun :**

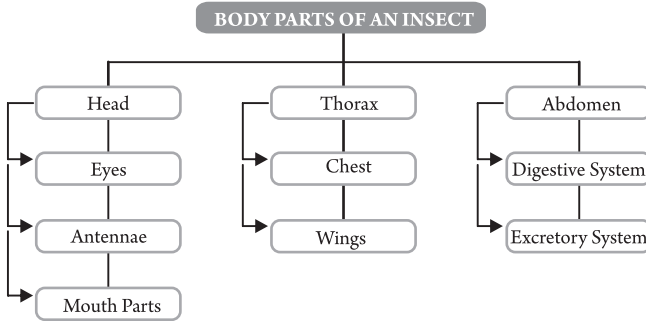


**Chapter 5 : Insects**

- A.** 1. (b) 2. (c) 3. (c) 4. (c) 5. (a)
- B.** 1. three 2. moth 3. chest 4. larvae 5. antennae
- C.** 1. F 2. T 3. T 4. T 5. F
- D.** 1. (v) 2. (iv) 3. (ii) 4. (i) 5. (iii)
- E.** 1. Insects breathe with the help of spiracles.  
2. They have composite eyes that have thousands of lenses. With the help of their eyes they detect the motion of things around them.  
3. Their purpose of living together in colonies is to get protection from enemies and share food and work.  
4. Many insects are harmful to us. They spread diseases. To get rid of the harmful insects, we can keep dried neem leaves in clothes.
- F.** 1. The body of an insect consists of three main parts :  
1. Head 2. Thorax 3. Abdomen
- Head :** An insect has mouth parts on their head, a pair of eyes and a pair of antennae.
  - Thorax :** The chest of an insect is known as thorax. It has three segments.
  - Abdomen :** The abdomen is the stomach of an insect. It has eleven segments.
2. The series of changes through which an organism goes during its life is called its life cycle.
3. Some insects are very useful to us. We get honey from bees and beeswax from their hives. And we get silk from silkworms.  
But many insects are harmful to us. They spread disease and damage crops, spoil food, books, furniture, clothes, etc.
4. Insects have a hard outer covering called exoskeleton. It provides the necessary support as well as flexibility to their body.

5. To get rid of the harmful insects, we can use chemicals like insecticides and pesticides.

**Let's Have Fun :**



**Chapter 6 : Food and Health**

- A.** 1. (b) 2. (b) 3. (c) 4. (c)
- B.** 1. Food 2. roughage 3. protein 4. Milk 5. Water
- C.** 1. T 2. T 3. F 4. T 5. F 6. F
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.**
- All living things need food to stay alive. Food helps us to grow and stay healthy. It gives us energy to work and play.
  - The different types of food give our body all that it needs to perform different activities. These are called nutrients.
  - Nutrients which help our body to fight from diseases are known as vitamins. Nutrients which help in the formation of bones, teeth and blood are known as minerals.
  - The food that we eat on a regular basis forms our diet. A balance diet has the right quantity of protein, fat, carbohydrate, vitamins and minerals salts. We need to take a balanced diet for healthy growth and development of our body.
  - Roughage helps in the proper functioning of the digestive system by moving wastes out of the body.
- F.**
- Because milk provides calcium. We must need calcium for our bones. Milk gives us energy. It is a good source of vitamin D and calcium.
  - Eating too much food requires your organs to work harder. It is not healthy for us. It can even impact your sleep. It effects your digestive system.
  - Because water is very essential for our body to function properly.
  - We must eat food rich in fibre because fibre helps in the proper functioning of the digestive system by moving wastes out of the body.

5. Because protein helps us to grow. This is why children need more protein.

### Let's Have Fun :

Nutrients	Sources	Function
Carbohydrate	Rice, Wheat, Potato	give us energy
Fat	Oil, nuts, butter	give us more energy
Protein	Egg, fish, Cheese	help us to grow
Vitamins	Fruits, Vegetables, Milk	help our body to fight from diseases
Minerals	Meat, fish, milk	help in formation of bones, teeth and blood

### Chapter 7 : Teeth and Microbes

A. 1. (b) 2.(c) 3.(a) 4.(b)

B. 1.Incisors 2.Molars 3.apatite 4.Microorganisms 5.four

C. 1. T 2.F 3.T 4.F 5. T

D. 1.(v) 2.(iv) 3.(i) 4.(ii) 5.(iii)

E. 1. Because when we eat, some of the food remains on or between our teeth. Germs thrive on that food.

2. Because when we eat a meal without washing our hands, the germs on our hands go into our mouth. Germs can cause infections.

3. Because salads and fruits are healthy for our teeth and gums.

F. 1. When babies are born, they have no teeth. Their first tooth appears when they are seven to nine months old. By the end of two years, they have their first full set of 20 teeth. They are called temporary teeth.

Between the age of six and twelve, the milk teeth fall out one by one and new ones grow in their place. This set now has 32 teeth. These are called permanent teeth.

2. Follow the ways to protect your teeth :

(i) Brush your teeth after every meal.

(ii) Clean your tongue daily with tongue cleaner.

(iii) Visit your dentist regularly for check-ups.

(iv) Do not have too many sweets and chocolates.

(v) Eat foods that are rich in calcium and vitamin C.

3. There are four main kinds of microbes :

(i) **Bacteria** : These are single-celled micro-organisms. Harmful bacteria can cause, typhoid, pneumonia, tuberculosis and diphtheria.

(ii) **Virus** : These are smaller than bacteria. They destroy the cells and cause diseases like influenza, mumps, polio, and common cold.

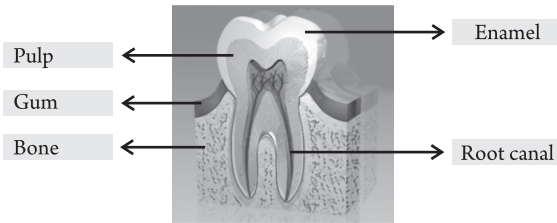
(iii) **Protozoa** : They live in wet places. Some of them live in the bodies of

plants and animals. They cause diseases like malaria and dysentery.

(iv) **Fungi** : These grow on dead and decaying matter. These are cause disease like ringworm and athlete's foot.

G. 1. Enamel 2. Plaque 3. Pulp 4. Tooth brush 5. Molars

**Let's Have Fun :**



### Model Test Paper - 1

A. 1. (c) 2. (c) 3. (a) 4. (b) 5. (c)

B. 1. T 2. T 3. T 4. F 5. F

C. 1. Clean, well-kept 2. Incisors 3. Molars 4. apatite 5. Microorganisms  
6. four

D. 1. Plants that grow on land are called terrestrial plants. Mango tree, peepal tree and rose plant are terrestrial plants.

2. **Step 1** : Take 10 to 15 ml of water in a test tube. Make starch solution by dissolving a gram or two of starch.

**Step 2** : Boil the contents till a translucent solution is obtained.

**Step 3** : To about 2 ml of this starch solution add 2 drops of iodine solution.

**Conclusion** : When we add iodine to the bleached leaf, it turns blue-black. That shows starch is present in a green leaf.

3. Potato and ginger grow through the stem. They are underground stem. Potato has tiny buds which grow into new potato plants. The buds of ginger also given rise to new ginger plants.

4. They have strong arms and legs to climb on trees. The spines or plates on their bodies prevent from slipping while climbing. They have claws and broad hip girdles to support their body while climbing. Their fingers and thumb are shaped in such a way that they can hold the branches firmly. Monkeys use their tails to grip branches and hang down for swinging.

5. Insects have a hard outer covering called exoskeleton. It provides the necessary support as well as flexibility to their body.

E. 1. Because when we eat, some of the food remains on or between our teeth. Germs thrive on that food.

2. Because when we eat a meal without washing our hands, the germs on our



hands go into our mouth. Germs can cause infections.

3. Because salads and fruits are healthy for our teeth and gums.

### Chapter 8 : Our Clothes

**A.** 1. (a) 2. (c) 3. (a) 4. (a)

**B.** 1. waterproof 2. threads 3. healthier 4. clean, ironed

**C.** 1. F 2. F 3. T 4. T

**D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)

**E.** 1. Because the wool is a bad conductor of heat and it does not allow heat to pass on from body to surrounding.

2. Because they reflect the heat and keep the body cool.

3. Because these are synthetic fibres and made in factories from crude oil and chemicals.

**F.** 1. Clothes protect us from cold, heat, rain, dust and insects. Good clothes make us look smart.

2. Natural fibres are obtained from either plants or animals. Natural clothes are healthier to wear. Cotton, jute, flax and hemp are plant fibres.

Synthetic fibres are prepared artificially and are made in factories from crude oil and chemicals.

Nylon, rayon, lycra and polyester are some examples of synthetic fibres.

3. (i) Clothes should be washed properly with a good quality detergent or soap.

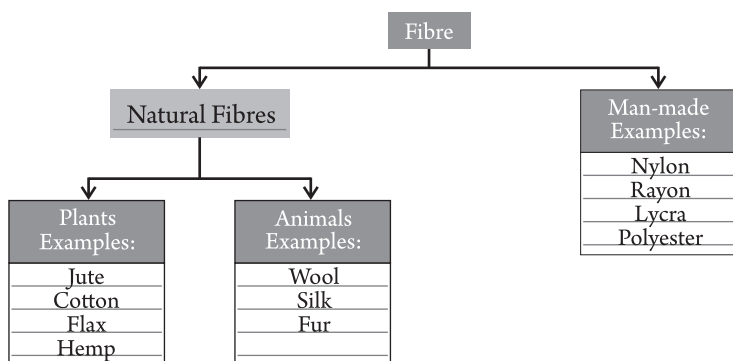
(ii) Coloured clothes should be dried in shade and white clothes should be dried in the Sun.

(iii) Cotton clothes should be ironed before wearing.

(iv) A torn piece of clothing should be mended in time.

(v) A patient's clothes must always be disinfected with an antiseptic solution.

**G.**



## Chapter 9 : Matter Around Us

- A.** 1. (a) 2. (b) 3. (c) 4. (b)
- B.** 1. atoms 2. solids 3. gases 4. soluble substance 5. Germs
- C.** 1. T 2. T 3. F 4. F 5. F
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.** 1. The molecules of liquids are loosely packed and can move around. That's why we always use container to store liquid.
2. The particles of the perfume mix with the particles of air. The molecules of gas are very loosely packed. They can move about freely because the forces holding the molecules together are very weak.
3. When sugar is put into water, the water molecules break the sugar into individual molecules.
- F.** 1. In solids the particles are packed closely together. The force between particles are strong enough so that the particles cannot move freely.  
In gas, the molecules are far away from one another. The molecules of gas are very loosely packed. They can move about freely because the forces holding the molecules together are very weak.
2. The solid which dissolves in a liquid is called solute, while the liquid is called solvent. When a solid dissolves completely in a liquid, the resulting liquid is known as solution. The quality of being soluble is known as solubility.
4. Water can be purified by sedimentation, decantation and filtration.
- (i) **Sedimentation** : In this process, insoluble impurities present in water are made to settle down by keeping it undisturbed for sometime.
- (ii) **Decantation** : In this process, clear water is transferred to another container carefully so that the settled impurities are not disturbed.
- (iii) **Filtration** : The process of removing insoluble impurities from water by using a filter paper is called filtration.

## Chapter 10 : Rocks and Soils

- A.** 1. (a) 2. (c) 3. (b) 4. (a)
- B.** 1. Gravel 2. Deserts, beaches 3. Clayey soil 4. Loamy soil
- C.** 1. T 2. F 3. T 4. T 5. F
- D.** 1. (vi) 2. (v) 3. (iv) 4. (i) 5. (ii) 6. (iii)
- E.** 1. **Igneous Rocks** : When the magma cools down, rocks are formed. These are called igneous rocks.
- Metamorphic Rocks** : Due to heat and great pressure on sedimentary and igneous rocks, metamorphic rocks are formed.
2. The following ways can be adopted for the conservation of soil :

- (i) **By Planting Trees :** Roots of the plants hold the soil particles firmly and do not let it washed away with water and blown away by the wind.
- (ii) **By Terrace Farming :** This reduces the force with which water comes town the slope and thereby, prevents soil from being washed away.
- (iii) **By Constructing Dams :** If we construct dams to control floods, then soil erosion can be prevented.
- (iv) **By Stopping Overgrazing :** Due to overgrazing, the top layer of the soil becomes loose and is easily blown or washed away.

### Chapter 11 : Force, Work and Energy

- A.** 1. (a) 2. (b) 3. (a) 4. (c) 5. (c)
- B.** 1. Gravitational force 2. friction 3. plank of wood 4. Water energy
- C.** 1. F 2. T 3. T 4. T 5. F
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.** 1. A boy slowing down by his bicycle due to frictional force.  
2. An apple falling from the tree on the Earth because of the effect of gravity.
- F.** 1. Force is a push or pull. A force always changes the state of motion of an object. It can change the shape of the object. It can stop the moving object.  
2. Energy is the ability to do work. To do work, we need energy. No task can be performed without energy. In fact, all living things need energy for their growth and development. We use different forms of energy in our daily life such as heat, light, sound, mechanical, electrical, chemical and magnetic. Energy can be changed from one form to another.  
3. There are different types of forces found in nature. They are gravitational force, frictional force, muscular force, mechanical force, elastic force, etc.  
4. We apply force to do work. In scientific terms, work is done when force is applied to an object to move it. No work is said to be done if the object does not move from its original position after applying force on it.  
5. The Sun is the main source of energy on the Earth. This energy obtained from the Sun is called solar energy. This solar energy can be changed into heat energy, light energy and electrical energy. It can be used to cook food, heat water and generate electricity. It helps reduce the high pollution levels.

#### Let's Have Fun :

Wind	Man Power	Fuel	Electricity
Yacht	Bicycle	Train	Drill machine
Windmill	Rickshaw	Car	Washing machine
Kite	Trolley		

## Chapter 12 : Measurement

- A.** 1. (b) 2. (b) 3. (a) 4. (c) 5. (c)
- B.** 1. tailor 2. Cups 3. Mass 4. Doctor 5. 98.6°F
- C.** 1. T 2. T 3. T 4. T 5. F
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.** 1. Length is the measurement of an object from end to end.  
(i) Keep the ruler straight.  
(ii) Place the ruler in such a way that the first marking on the ruler touches the starting point of the line.  
(iii) Sit straight and focus from the top and not from the sides.  
(iv) The length of the line would be the reading on the ruler that touches the end point of the line.
2. Capacity is the measure of the amount of liquid a container can hold. We have read that we should drink 8 glasses of water everyday. Utensils like spoons, cups, bowls, glasses, etc. are normally used at homes for measuring capacity. These are the non-standard units to measure the capacity.
3. Mass of an object is the amount of matter in an object. In simple words, mass of an object tells us how heavy or light that object is. There are different devices to measure the mass of an object like a weighing scale, beam balance or an electronic balance.
4. The term temperature refers to the degree of hotness or coldness of a body. Thermometer is used to measure temperature. The standard units of temperature are degree celsius ( $^{\circ}\text{C}$ ) and degree Fahrenheit ( $^{\circ}\text{F}$ ).

### Let's Have Fun :



Beam Balance



Thermometer



Litre



Metre rod

## Chapter 13 : Air, Water and Weather

- A.** 1. (a) 2. (b) 3. (a) 4. (a) 5. (b)
- B.** 1. oxygen, nitrogen 2. Water 3. humidity 4. water, water vapour
- C.** 1. F 2. F 3. F 4. T 5. T
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.** 1. In winter, early in the morning we can see drops of water on plants or grasses due to condensation. The process of conversion of water vapour into liquid is called condensation.

2. The safest method of purifying water is to boil it as boiling destroys germs.
- F.** 1. All living things need air to breathe. Without air, we cannot survive. Air is a mixture of gases. It has two main gases oxygen and nitrogen.
2. There are some ways of purifying water :
- Chemicals like chlorine are used to kill germs in water.
  - Addition of potassium permanganate crystals to water is a popular way of cleaning water since a long time.
  - Bleaching powder also kills germs in water.
  - The safest method of purifying water is to boil it as boiling destroys germs.
  - We can also use a water filter machine for cleaning water.
3. Cool air from above the sea blows towards the land. This is called sea breeze.
- And the cold air above the land blows towards the sea to take the place of the rising warm air. This is called land breeze.
4. The process of change of water into water vapour due to heating is called evaporation and when water vapour cools down it changes into drops of water. This is called condensation.

**Let's Have Fun :**



**Chapter 14 : The Earth and its Neighbours**

- A.** 1. (b) 2. (b) 3. (b) 4. (b) 5. (a)
- B.** 1. head 2. Jupiter 3. Rotation 4. Moon 5. Aryabhata
- C.** 1. T 2. T 3. F 4. T 5. T
- D.** 1. (v) 2. (iv) 3. (i) 4. (ii) 5. (iii)
- E.** 1. Earth is different from the other planets because it is the only planet that supports life.

2. The Earth rotates from west to east on its axis. As the Earth spinning, one half faces the Sun and the other half is in darkness. The part that receives sunlight has day and the dark part has night.
3. Seasons are caused by the revolution of the Earth around the Sun in changing tilt of the Earth's axis. The seasons depend on sunlight received by the Earth. When Earth gets much strong and direct rays on a small area are cause summer season. But when Earth gets slanting rays falling on a large area and the rays are weak, it cause winter season.

**Let's Have Fun :** Leo, Orion, Ursa Major

### Model Test Paper - 2

- A.** 1. (a) 2. (b) 3. (c) 4. (c) 5. (c)
- B.** 1. T 2. F 3. T 4. T 5. T
- C.** 1. head 2. Jupiter 3. Rotation 4. Moon 5. Aryabhata
- D.** 1. The molecules of liquids are loosely packed and can move around. That is why liquids do not have a fixed shape. Liquids can flow because of greater space between the molecules.
2. Wind, water and temperature act continuously on the rocks. This results in breaking down of rocks into smaller and smaller pieces. These pieces ultimately turn into sand. When this sand mixes with decaying plants and animals, it forms soil.
3. Force is a push or pull. A force always changes the state of motion of an object. It can change the shape of the object. It can stop the moving object.
4. (i) Keep the ruler straight.  
(ii) Place the ruler in such a way that the first marking on the ruler touches the starting point of the line.  
(iii) Sit straight and focus from the top and not from the sides.  
(iv) The length of the line would be the reading on the ruler that touches the end point of the line.
5. When it evaporates, it turns into water vapour and goes up into the atmosphere. This water vapour gets together with other water vapour and turns into a cloud.  
Condensation is the process where water vapour becomes liquid. For example, clouds are formed by the condensation of water vapour in the atmosphere.
- E.** 1. In winter, early in the morning we can see drops of water on plants or grasses due to condensation. The process of conversion of water vapour into liquid is called condensation.
2. The safest method of purifying water is to boil it as boiling destroys germs.