CLASS 6

SCIENCE

LAB MANUAL

(ENGLISH MEDIUM)

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ACTIVITY 1

FRUIT CHAT AND VEGETABLE SALD

Aim: To prepare fruit chat and vegetable salad.

Materials: different fruits and vegetables, knife, bowl, salt, sugar, dry fruits and honey.

Precautions:

1. We should be very careful while cutting the fruits.
2. We should also wash our hands, the fruits and vegetables properly before cutting them.

Procedure:

1. Washed our hands, fruits and vegetables and chopped them into small pieces.
2. Taken fruits and vegetables in separate bowls.
3. Added sugar, illachi, honey and dry fruits to the fruits and mixed them properly.
4. Added salt and pepper to the vegetables and mixed them properly.
5. Served fruit chat and vegetable salad in separate cups to all the teachers and among our friends.

Our experiences:

1. We learned to work together by cooperation and coordination.
2. We enjoyed a lot in sharing work and happiness.
3. All the teachers appreciated and blessed.

ACTIVITY 2

DIFFERENT TYPES OF MAGNETS

Aim: To observe and draw the diagrams of different types of magnets.

Materials required: Different types of magnets.

Precautions: We should handle the bar magnets carefully.

Procedure:

1. Displayed all the types of magnets.
2. Observed, drawn and named all the types of magnets.

Observation: We observed different shapes of magnets. We have drawn all the diagrams of magnets.

Details: There are four types of magnets. They are Bar magnet, Ring magnet, Coin magnets, and Horse shoe magnet.

Bar Magnet

Horse Shoe Magnet

Different magnets

Ring Magnet

Disc Magnet

ACTIVITY 3

POLES OF A BAR MAGNET

Aim: To find out the poles of a bar magnet.

Materials required: A bar magnet, iron filings and a paper.

Precautions: We should handle the magnets carefully.

Procedure:

1. Collected the iron filings in a paper.
2. Spread some iron filings on a sheet of paper.
3. Placed a bar magnet below this sheet and observed.

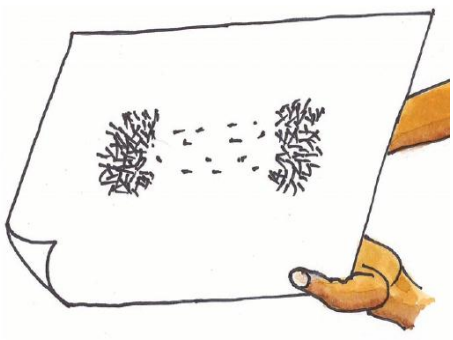
Observation:

1. We observed that the uniformly spread iron filings concentrate at two points of the paper sheet.
2. At some distance we found some scattered iron filings between these two points.

Conclusion:

1. The spread of iron filings on the sheet of paper is due to magnet below it
2. The iron filings move towards its ends because of this magnet.
3. Thus the ends of the bar magnet attract more iron filings than the middle part of the magnet.
4. So every bar magnet has two ends whose attracting capacity is more than its other parts.
5. These are called poles of the magnets.

Bar Magnet



ACTIVITY 4

DIRECTIONAL PROPERTY OF MAGNET

Aim: To find out the directions with a bar magnet and observe the directional property of a bar magnet.

Materials required: A bar magnet, stand and a thread.

Precautions:

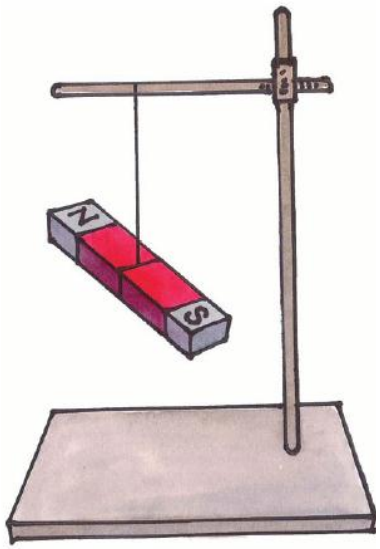
1. Handle the magnet carefully.
2. When the magnet is suspended freely, the magnet should not touch the stand.

Procedure:

1. Taken a bar magnet and tied with a thread.
2. Suspended this magnet with the help of a stand and observed.
3. When it came to rest, marked the end that points towards the North with some color.
4. Again and again disturbed it and observed the directions.

Observation:

1. When the magnet is suspended, it took the position of North and South directions.
2. Even it is disturbed again and again, It always came to the rest in the North – South directions.
3. In each case the marked end points towards North.



Conclusion:

1. The pointed end is known as North pole and the other end is known as South pole of the magnet.
2. This property of magnet is known as Directional property.

ACTIVITY 5

ATTRACTION AND REPULSION OF MAGNETS

Aim: To test the attraction and repulsion property of magnets.

Materials required: Two bar magnets.

Precautions:

1. Handle the magnets carefully.

Procedure:

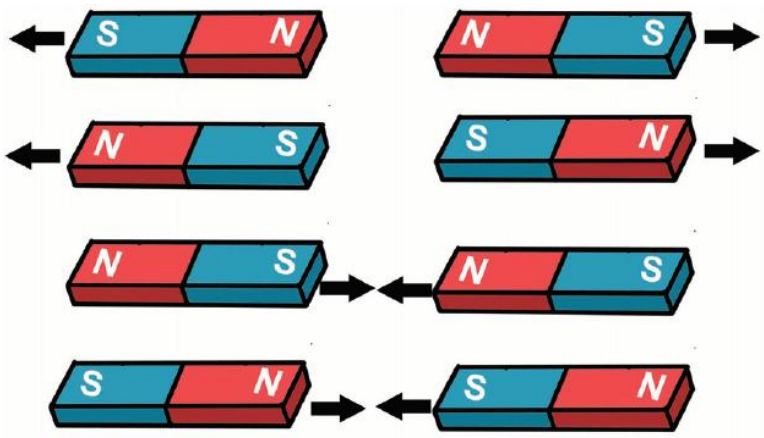
1. Taken four similar magnets and placed them in four different ways, such as
   - North poles of the two magnets facing each other.
   - South poles of two magnets facing each other.
   - North pole of first magnet facing South pole of second magnet.
   - South pole of first magnet facing North pole of second magnet.
2. Each time observed our experiences and noted them in our note book.

Observation:

1. North poles of the magnets repelled each other and South poles of the magnets also repelled each other.
2. But North and South poles attracted each other.

Conclusion:

1. The like poles of magnets repel each other and unlike poles attract each other.



ACTIVITY 6

MAKING OF OUR OWN MAGNET

Aim: To make our own magnet.

Materials required: A bar magnet, nail and iron filings.

Precautions:

1. Always move the magnet in one direction.
2. Not to draw the magnet back and forth.

Procedure:

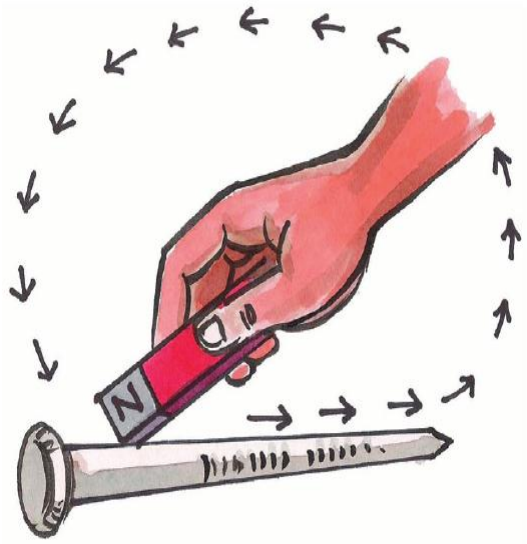
1. Taken an iron nail and placed it on the table.
2. Taken a bar magnet and placed one of its poles near one edge of the nail.
3. Without lifting the bar magnet moved it along the length of the iron nail till reached the other end.
4. Then lifted the bar magnet, brought it to the first end of the nail and moved along the length again.
5. Repeated this process 20 – 30 times.
6. Now removed the bar magnet and brought some iron filings close to the nail.

Observation:

1. The iron filings get attracted by the nail.

Conclusion:

1. When the nail is rubbed with a magnet, the nail becomes a magnet.
2. So it attracted the iron filings.



ACTIVITY 7

MAGNETIC INDUCTION

Aim: To prove the magnetic induction.

Materials required: Bar magnet, safety pin and some more pins.

Procedure:

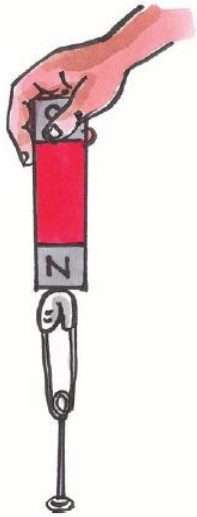
1. Taken a safety pin and brought it close to a pin and observed.
2. Now brought the safety pin close to one pole of a bar magnet and observed.
3. Now brought another pin and touched it to the safety pin and again observed.
4. The safety pin is removed from magnetic contact and observed.

Observation:

1. When an alpin is brought near to the safety pin, they are not attracted.
2. But when it is brought near to the safety pin which is in contact with the bar magnet.
3. When the safety pin is detached from the magnet, the alpins also detached from the safety pin and fell down.

Conclusion:

1. In the above two cases, we noticed that the safety pin acts as a magnet when it is in contact with another magnet.
2. Magnetic property is induced in safety pin due to the bar magnet.
3. Magnetic property possessed by a magnetic substance due to the presence of a magnet near it, is called magnetic induction.
4. When the safety pin is not in contact with the bar magnet, it no more acts as a magnet. With this magnetic induction is proved.



ACTIVITY 8

MAGNETIC COMPASS

Aim: To make a magnetic compass.

Materials required: A glass of water, a magnetized needle, tape, cork, detergent and a needle.

Precautions:

1. The needle must be properly magnetized.
2. The floating magnetized needle should not touch the wall of the glass.

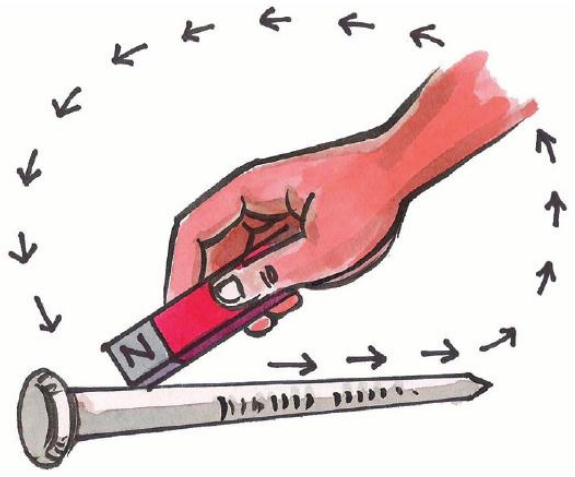
Procedure:

1. Taken a magnetized needle and taped the needle to a light cork.
2. Taken a glass of water and allowed the cork with needle to float in the water.
3. Added a little pinch of detergent to water to help the cork float freely.
4. When it comes to the rest, the directions are observed.

Observation: It is observed that the needle pointed North and South directions.

Conclusion:

1. Since it is magnetized needle, it exhibits the property of direction.
2. So it acts like a magnetic compass.



ACTIVITY 9

TRANSPARENT, OPAQUE AND TRANSLUCENT OBJECTS

Aim: To find out the differences between transparent, translucent and opaque objects.

Materials required: A paper, a plastic cover and oil.

Procedure:

1. Taken a plastic cover and tried to see the lighted bulb through it and noted the observations.
2. Taken a paper and again tried to see the lighted bulb through it and noted our observations.
3. Now put a few drops of oil on that sheet and again try to see the bulb through it. Noted our observations in our record.

Observations:

1. When the lighted bulb is observed through the plastic cover, it is clearly seen.
2. When it is repeated with the sheet of paper, it is not seen.
3. But when it is done with oil paper the bulb is visible but not clearly.

Conclusion:

1. The materials through which we can see the things are known as transparent objects such as polythene cover.
2. The materials through which we cannot see the things are known as opaque objects like a paper sheet.
3. The materials through which we can see but not very clearly are known as translucent objects such as oil paper.
4. As per the above observations, the plastic cover is a transparent object. Paper is a opaque object. Oil paper is a translucent object.

ACTIVITY 10

SINKING AND FLOATING

Aim: To classify the things as sinking and floating.

Materials required: Different things, Beaker and water.

Procedure:

1. Collected different things like tomato, brinjal, potato, iron nail, sponge, wood, stone, leaf, piece of chalk, and paper.
2. Taken a beaker of water and dropped each of these things one by one into the water.
3. Each time observed whether they sink or float and recorded the observations.

Observations: The following observations are made. Some of the above items sink in the water and some of them float in the water.

SN	PREDICTION	OBJECTS
1		
2		

Conclusion: From the above activity we classified the things as sinking and floating.

ACTIVITY 11

SEDIMENTATION AND DECANTATION

Aim: To show the sedimentation and decantation as a separating process.

Materials required: Two tumblers, mixture of soil and water.

Precautions: The tumbler with the mixture should not be disturbed to allow the settlement.

Procedure:

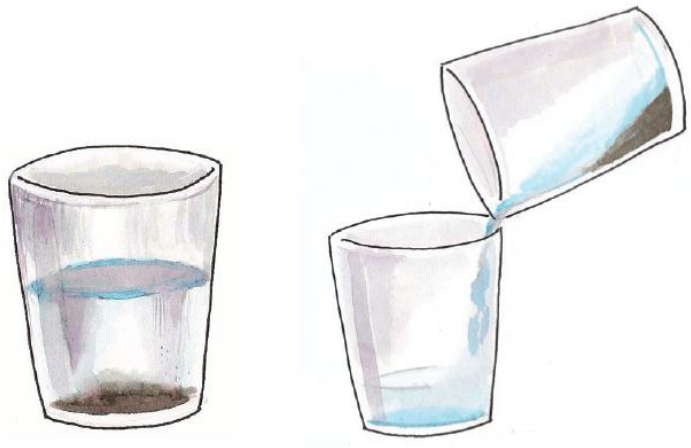
1. Taken a mixture of soil and water in a glass tumbler and kept it undisturbed for some time.
2. Later the tumbler is gently lifted and the tip of the tumbler is inclined on the edge of another tumbler without disturbing the mixture.

Observed:

1. When the mixture is kept undisturbed, the sand and mud particles in the soil settle down at the bottom of the glass tumbler.
2. When this tumbler is inclined on the another tumbler the upper layers of water gets separated from the sediments.

Conclusion:

1. The settling down of the mud at the bottom of tumbler is known as sedimentation.
2. Separation of the water from the upper layers of the mixture after sedimentation is known as decantation.



ACTIVITY 12

CRYSTALLIZATION

Aim: To observe the crystallization method as one of the methods of separation of mixtures.

Materials required: A beaker, salt and water.

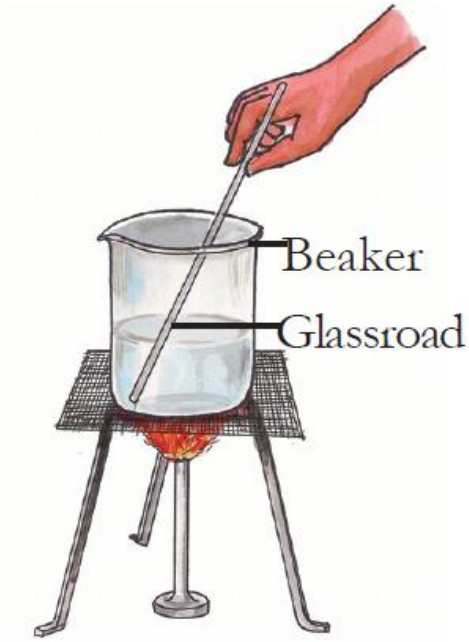
Procedure:

1. Taken a beaker and filled it with water.
2. Added some salt to it and stirred it and continued to add salt and stir until saturation is attained.
3. Then heated this salt solution till all the water in the beaker has evaporated

Observation: We noticed the formation of salt crystals and powder at the bottom of the beaker.

Inference:

1. This method is known as crystallization.
2. The mixtures in which the salts are dissolved in water can be separated by this method called Crystallization.
3. This property of salt is used in making of salt.



ACTIVITY 13

DISTILLATION

Aim: To prepare the distilled water.

Materials required: Two conical flasks, water, corks, glass tubes, plastic tube and burner.

Precautions:

1. We should be careful while heating the water.
2. The glass tube should not dip into the water in the conical flask.

Procedure:

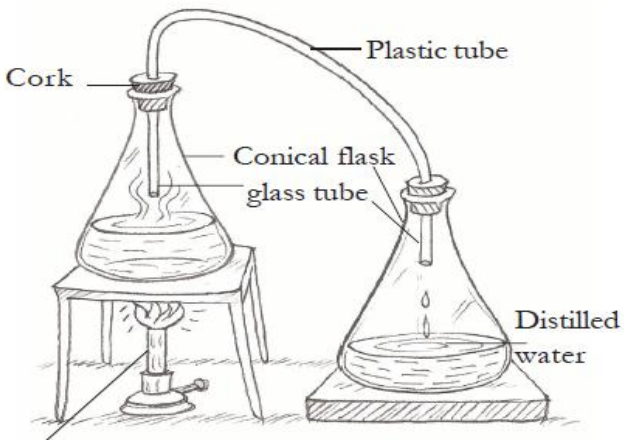
1. Filled a conical flask with water and closed it with a cork having a hole.
2. Inserted a glass tube through the hole.
3. Taken another conical flask with a cork having a hole and inserted another glass tube.
4. Connected both the tubes with a plastic tube.
5. Heated the flask containing water using a burner and noted the observations.

Observations:

1. After some time the water vapour started going into the second conical flask through the glass tube.
2. The water vapour slowly turned to water.

Result:

1. As a result of this process, the pure water is collected in the second conical flask which is called Distilled water.
2. This process is used to separate the impurities from the water.



ACTIVITY 14

SUBLIMATION

Aim: To get pure camphor by the process of sublimation.

Materials required: China dish, funnel, cotton, mixture of camphor and salt and burner.

Precautions: One should be careful while using the burner.

Procedure:

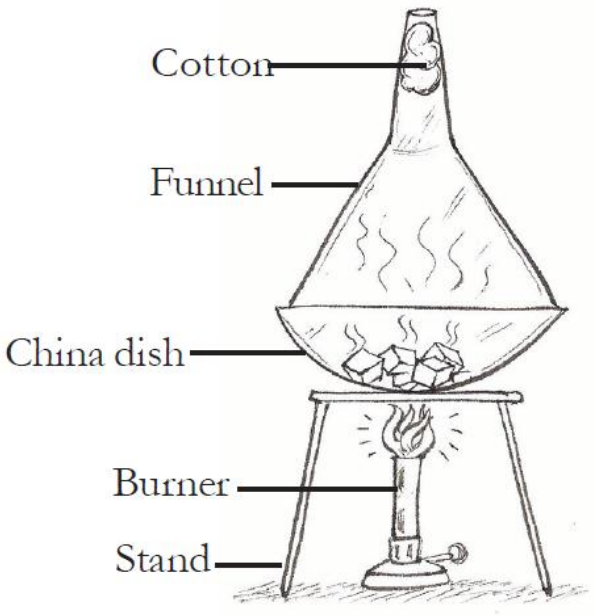
1. Taken a mixture of camphor and powdered salt in a china dish and covered it with a funnel.
2. Closed the tube of the funnel with cotton.
3. Placed the dish on a stand and heated it with a burner.

Observation:

1. When camphor is heated, it transferred directly into gaseous state and settled on the walls of funnel when it is cooled.
2. The salt remained in the china dish itself.

Conclusion:

1. The process in which a substance changes directly from solid to gaseous state is known as Sublimation.
2. It can be used to get pure sublimated substances like camphor.



ACTIVITY 15

CHROMATOGRAPHY

Aim: Separating colors from a mixture of colors by the method of chromatography.

Materials required: Water, plate, chalk piece and ink.

Precautions: The water in the plate should not touch the ink mark.

Procedure:

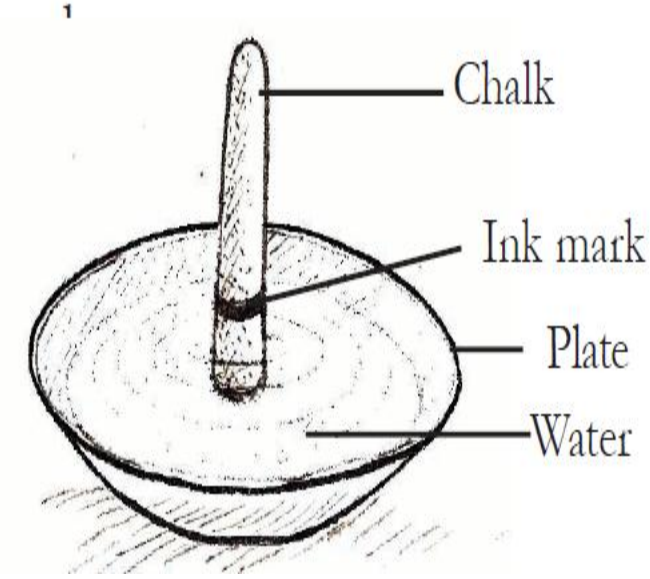
1. Taken a whole stick of white chalk.
2. Around the curved surface of the chalk put an ink mark with black ink.
3. Now poured some water in a plate and kept the piece of chalk in the water.
4. Left it for sometime undisturbed and observed.

Observation:

1. It is observed that different color patterns appear on the chalk piece moving from the ink mark.
2. The black color ink gave out orange, green and violet colors.

Conclusion:

1. The ink appears to be made of a single color but it is actually a mixture of many colors hidden in it.
2. This method of separation of colors from a mixture of colors is known as Chromatography.
3. We can also try this activity with different ink colors.
4. The juice extracted from the leaf can also be tested in this method for different pigments.



ACTIVITY 16

PARTS OF A PLANT

Aim: To observe the different parts of a plant.

Materials required: Different plants.

Procedure:

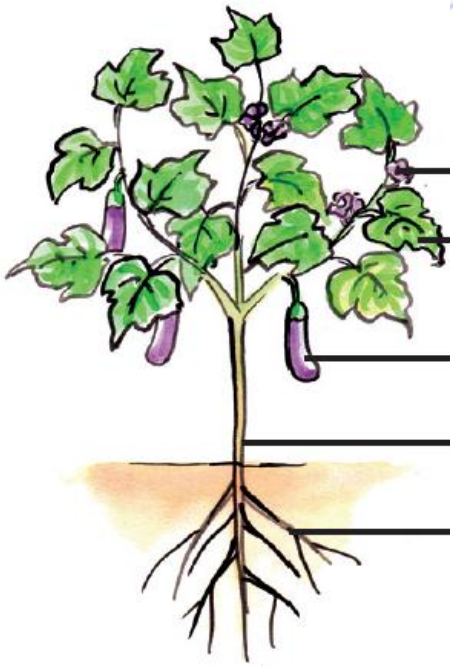
1. Collected the different plants along with the roots.
2. Observed these plants, identified different parts and drawn the diagram of a typical plant.

Observations: The following observations are made.

SN	NAME OF THE PLANT	ROOT-Y/N	STEM-Y/N	LEAVES-Y/N	FLOWER-Y/N
1					
2					
3					
4					

Conclusion:

1. Each plant contains Roots, Stem, Leaves, Flowers and Fruits.
2. There are variations in the size and shape of the plants but generally all plants have the above said plant parts.



ACTIVITY 17

ROOT SYSTEMS AND LEAF VENATION

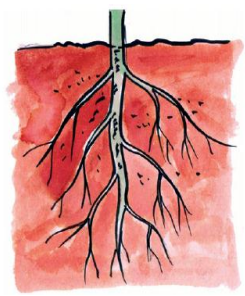
Aim: To observe the types of root systems and leaf venation and to relate them

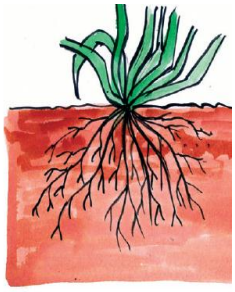
Materials required: Different plants along with roots.

Precautions: While collecting the plants we should not disturb other plants, bird nest

Procedure:

1. Collected different plants along with the roots.
2. Observed each root and the type of leaf venation, noted and drawn our observations.

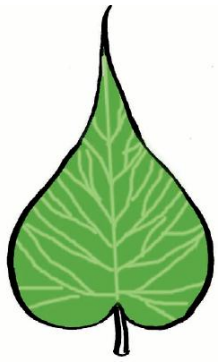


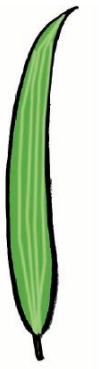


Observations:

1. Two types of roots are observed in different plants.
2. As well as there are two types of leaf venation.

S N	NAME OF THE PLANT	ROOT SYSTEM	LEAF VENATION





Conclusion:

1. Majorly there are two types of root systems, Tap root system and Fibrous root system.
2. In tap root system the main root becomes thick and has rootlets or lateral roots.
3. In fibrous root system there is small hair like roots arising from the base of the stem.
4. As well as there are two types of leaf venation, reticulate leaf venation and Parallel leaf venation.
5. In reticulate leaf venation there is along vein present in the middle of the lamina called midrib and the branches arising from the midrib are called lateral veins.
6. In parallel venation all the veins are same and parallel to each other.
7. From the above observation it is concluded that the plants with tap root system have leaves with reticulate venation and the plants with fibrous root system have leaves with parallel venation.

ACTIVITY 18

ABSORPTION OF WATER

Aim: To prove that the roots absorb water.

Materials required: Glass tumblers, water, two plants and ink.

Precautions: The plants should have thin stems and roots.

Procedure:

1. Taken two glass tumblers filled with water.
2. Collected two plants having soft stem along with their roots.
3. Added color in one of the tumblers and placed the plants in each of the tumbler.
4. Left this arrangement for 3-4 hours and noted the observations later.

Observations: After 3-4 hours red spots on the stem and other parts of the leaves of the plant in red ink glass are observed.

Conclusion:

1. From the above observation it is concluded that the roots help in taking up of water from the soil by absorption.
2. Minerals present in the soil are also absorbed along with the water.

ACTIVITY 19

STOMATA

Aim: To observe the stomata in the leaf peel.

Materials required: A leaf, slide, water and microscope.

Precautions: While placing the leaf peel on a slide, care should be taken to avoid folding.

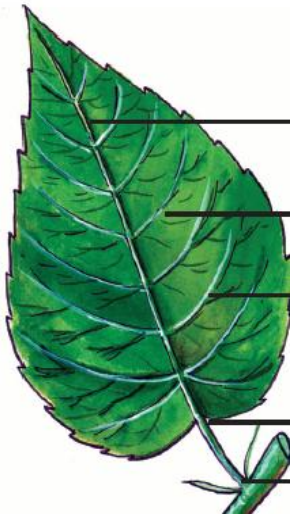
Procedure:

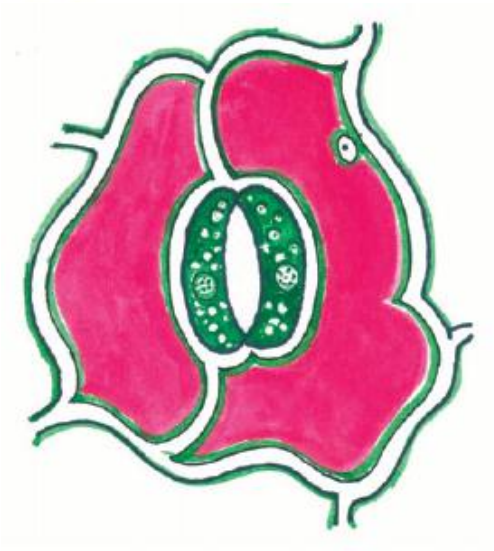
1. Taken a fleshy and peeled the outer layer of the leaf.
2. Placed the peel on the slide, added a drop of water on it and observed under microscope.
3. Drawn the diagram of observation.

Observations: Many cells and a small bean shaped structures are observed.

Details:

1. The bean shaped structures in the leaves are called as stomata.
2. Stomata are useful in exchange of gases between plant and atmosphere.





ACTIVITY 20

TRANSPIRATION

Aim: To prove the transpiration through the leaves.

Materials required: A potted plant, a polythene cover and a thread.

Precautions: Tie the polythene bag to the plant tightly so that the water does not escape.

Procedure:

1. Selected a well watered plant that has been growing under the Sun.
2. Enclosed a leafy branch of the plant in a polythene bag and tied up its mouth.
3. Taken another polythene bag of same size and tied up its mouth without keeping any plant.
4. Kept both the polythene bags under the Sun and observed after few hours.

Observation:

1. It is observed that the polythene bag which is tied to the plant contained water droplets.
2. But the polythene bag which is tied without the plant did not have any water droplets.

Conclusion:

1. From the above observation it is concluded that the plants loose the water through the leaves.
2. Plants release excess of water in their body through stomata and some other parts as well.
3. The water is released in the form of vapor and this process is called Transpiration.
4. These vapors condense and are seen as droplets in the polythene bag.

ACTIVITY 21

CONDITIONS FOR MAKING CURD

Aim: To find out the conditions for making curd.

Materials required: Three bowls, lukewarm milk, cold milk and curd.

Precautions:

1. All the bowls must contain the lids.
2. When the curd is added, it must be mixed with the milk properly.

Procedure:

1. Taken three empty bowls along with lids.
2. Taken cold milk in bowl 1, lukewarm milk in bowl 2 and 3.
3. Added a small quantity of curd to the bowls 1 and 2 and stirred properly.
4. The bowl 3 is not added with the curd.
5. Covered all the bowls with the lids and kept them in our class room.
6. Left it undisturbed till the next day.

Observation:

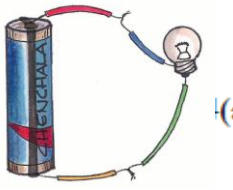
1. The milk in the bowls 1 and 3 is not converted into curd.
2. But the milk in the bowl 2 is converted into the curd.

Conclusion:

1. Though the sample curd is added in both 1 and 2 bowls, only the bowl having warm milk is converted into curd.
2. The cold milk is not converted into curd.
3. When we compare bowl 2 and 3, only the milk which is added with curd is converted into curd where as the milk which is not added with curd is not converted into curd.
4. From the above observations it is concluded that for making curd, the warm milk and curd are the necessary conditions.

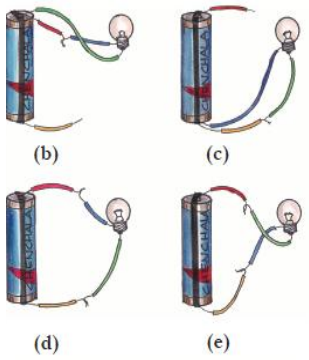
ACTIVITY 22

SIMPLE ELECTRIC CIRCUITS



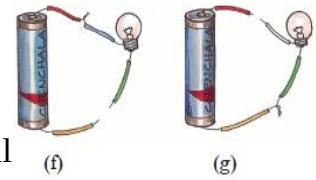
Aim: To construct a simple electric circuit.

Materials required: A cell, a bulb and wires.



Precautions:

1. The bulb should be in working condition.
2. The cell must be fully charged.
3. The insulation must be removed at the ends of the wires.



Procedure:

1. Taken a cell and a bulb and connected them with the wires.
2. While connecting the positive terminal of the cell is connected to negative terminal of the bulb and negative terminal of the cell is connected to positive terminal of the bulb. Observed the result.
3. Now connected the wires in different forms and checked whether the bulb glows or not.

Observation:

1. At the first situation i.e. (a) when the cell and the bulb are connected with opposite terminals, the bulb started glowing.
2. But in the remaining situations like connection with the same terminals, bulb connected to the same terminal of the cell, a gap in connection, the bulb did not glow.

SN	CONNECTION	DOES THE BULB GLOW(Y/N)

Conclusion:

1. From the above observation it is concluded that an electric circuit provides a complete path of electricity to flow between cell and the bulb.
2. So an electric circuit consists of a cell and a bulb which are connected with opposite terminals without any gaps.
3. Electricity passes from positive terminal to negative terminal.

ACTIVITY 23

CIRCUIT WITH A SWITCH

Aim: To construct a circuit with a switch or tap key.

Materials required: A cell, bulb, wires, drawing pins, wooden plank and a safety pin.

Precautions:

1. The bulb should be in working condition.
2. The cell must be fully charged.

Procedure:

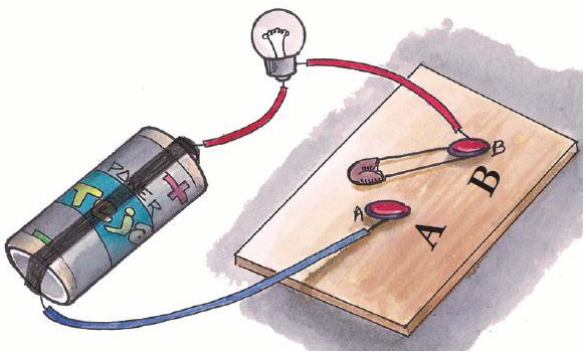
1. Connected a circuit on a wooden plank and inserted two drawing pins at A and B.
2. Inserted a safety pin in between A and B such that one end of the pin is completely in contact with B and the other end of the pin is left free.
3. Observed the bulb whether it glows or not.
4. Now tapped the safety pin so that it touches the point A and observed whether the bulb glows or not.

Observation:

1. When the safety pin is left free at one end, the bulb did not glow.
2. But when the safety pin is tapped to touch the point A, the bulb started glowing.

Conclusion:

1. In the above activity the safety pin is used to close / open the circuit like a switch.
2. So the switch allows the flow of electricity when it is on and cuts off the flow of electricity when it is off .
3. In this way the switch is used to allow / stop the flow of electricity to the bulb or any other electrical device.



ACTIVITY 24

INSULATORS AND CONDUCTORS

Aim: To identify the conductors and insulators of the given objects.

Materials required: Different things and tap key or circuit with switch.

Precautions:

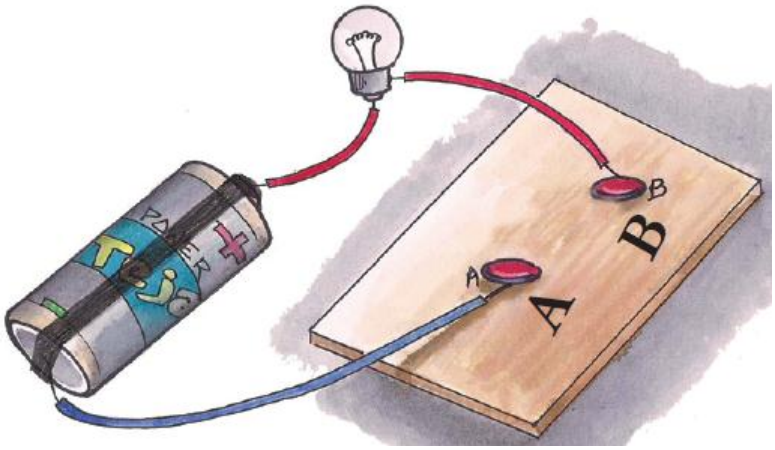
1. The bulb should be in working condition.
2. The cell must be fully charged.

Procedure:

1. Taken a circuit with a switch and removed the safety pin so that we had two open terminals A and B.
2. Inserted different objects like a hair pin, safety pin, eraser, plastic scale, match stick, piece of metal bangle, paper clip etc. in the gap between A and B.
3. With each insertion, checked whether the bulb glows or not and recorded observations in the table.

Observation: The following observations are made.

SN	OBJECT	MATERIAL	DOES THE BULB GLOW(YES/NO)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			



Conclusion:

1. In the above activity the bulb glows in some cases and does not glow in other cases i.e. some substances allow electric current to flow through them and some do not allow.
2. Substances which allow electric current to flow through them are known as Conductors of electricity.
3. Substances which do not allow electric current to flow through them are known as Insulators.
4. Above taken things are classified as conductors and insulators as follows.

CONDUCTORS	INSULATORS

ACTIVITY 25

THICKNESS OF A COIN

Aim: To measure the thickness of a coin.

Materials required: 10 coins and scale.

Procedure:

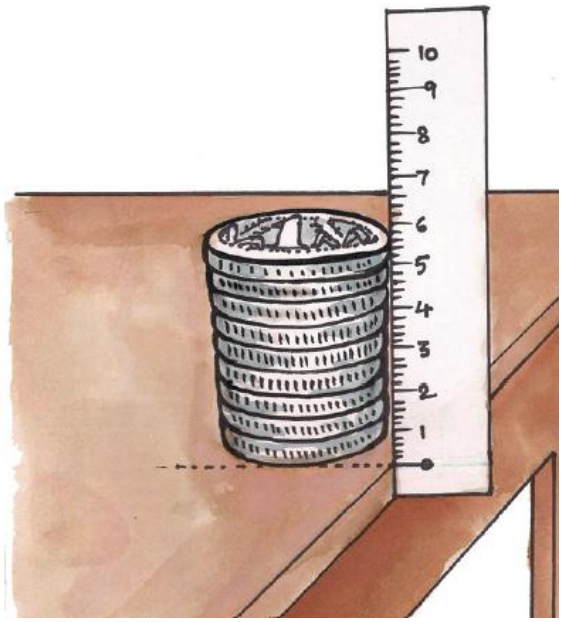
1. Taken about 10 one rupee coins of same size and place them one upon the other.
2. Measured the total thickness with a scale and then divide it by the number of coins to get the thickness of one coin.

Observation:

- Thickness of 10 coins = x
- Thickness of one coin = x/10

Result:

1. The thickness of coin is mm.
2. We can also measure the thickness of thread or foil in this method.



ACTIVITY 26

CURVED PATH

Aim: To measure the length of a curved path.

Materials required: alpines and thread.

Precautions:

1. Care should be taken that the thread is neither too tight nor too loose.
2. The thread should coincide with the curve at each point while moving along the path.

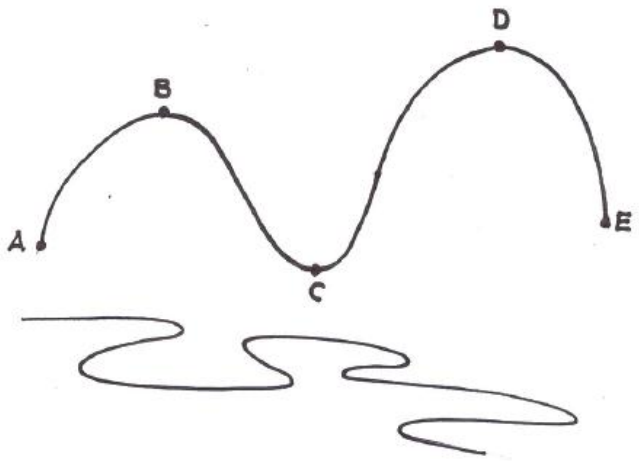
Procedure:

1. Fix an alpine at the end of the curved line to be measured and it is indicated as A.
2. Now tied a knot with cotton thread to the alpine i.e. at the point A and moved the cotton thread along points B, C, D, E, etc.
3. When the thread reaches the extreme end of the curved path, cut at the thread at that point.
4. Remove the thread from A and then placed it strait along the length of a meter scale, and measured its length.

Observation:

1. The length of the thread is the measure of the length of the curved path.
2. So the length of the curved path is .

Conclusion: The length of the curved path can be found out by using a thread.



ACTIVITY 27

IRREGULAR PLANE SURFACE

Aim: To measure the irregular plane surface by using graph.

Materials required: Leaf, graph paper and a pencil.

Precautions: neglected those squares inside the boundary which are less than half.

Procedure:

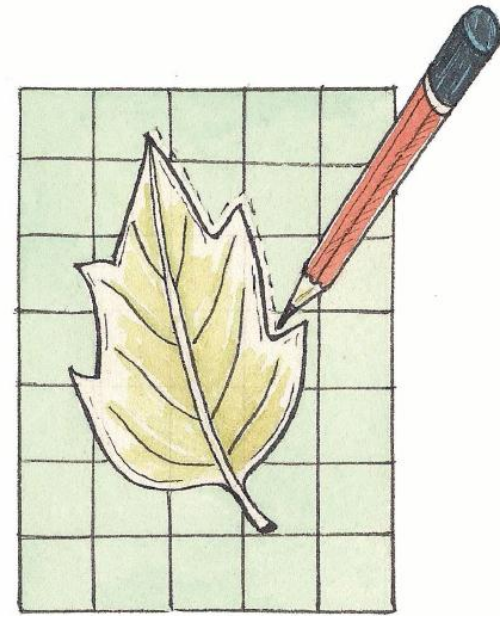
1. Taken a leaf with an irregular shape and placed it on a graph paper.
2. Marked the boundary of the piece of leaf on the graph paper.
3. Now removed the leaf and counted the number of complete squares inside the boundary.
4. Also counted those squares inside the boundary, which are half or greater than half.
5. Added this to the number of complete squares.

Observation:

1. The total number of squares inside the boundary gives the area of the leaf.
2. There are _____ squares inside the boundary. So the area of the leaf is _____cm square.

Conclusion:

1. The area of an irregular shape can be measured by using the graph paper.
2. But this process gives us the value or area which is close to the actual area.



ACTIVITY 28

VOLUME OF IRREGULAR SOLIDS

Aim: To measure the volume of irregular solids using a measuring cylinder .

Materials required: A stone, measuring cylinder, thread and water.

Procedure:

1. Taken a measuring cylinder, filled almost half of it with water and recorded the volume of water.
2. Now tied a small irregular stone with a fine cotton thread.
3. Put the solid gently into the water in the cylinder so that it is completely immersed in water.
4. Again observed the volume of water and recorded the reading.

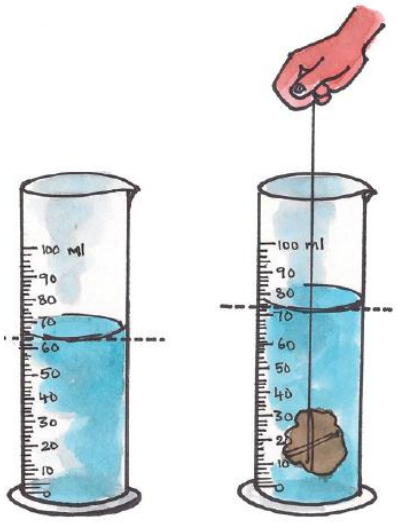
Observation: It is observed that the water level is raised when the stone is placed in the cylinder.

Conclusion:

1. The level of the water in the measuring cylinder rises as the stone displaces water equal to its own volume.
2. So the volume of the stone is the difference between the final reading and the initial reading.

Calculation:

- The initial volume of the water (initial reading) = ml.
- The final volume of the water (final reading) = ml.
- The volume of the stone = Final reading – initial reading



ACTIVITY 29

PINHOLE CAMERA

Aim: To make a pinhole camera and understanding the straight line motion of light.

Materials required: Two PVC pipes with different diameters, black drawing sheet, white paper, rubber band, pin and oil.

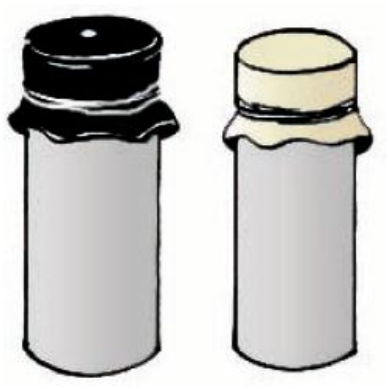
Precautions: Taken care to make a very minute hole to the black cap.

Procedure:

1. Taken two PVC pipes, one is of 8 cm in diameter and of 30 cm in length, another one is of 7 cm in diameter and of 20 cm in length.
2. Cut a piece of black paper and put it like a cap at one end of the big PVC pipe and fix it with a rubber band.
3. Put a white paper like a cap at one end of the thinner PVC pipe and fix it with a rubber band.
4. Now make a whole in the middle of the black paper cap with the help of a pin.
5. Put 2 to 3 drops of oil on the white paper cap so that it becomes translucent.
6. Insert the thin pipe into the big pipe and pin hole camera is ready.
7. Arranged a light candle in front of the pinhole camera and moved the thinner pipe forward and backward to get a clear picture of the candle on the screen of the thin pipe.

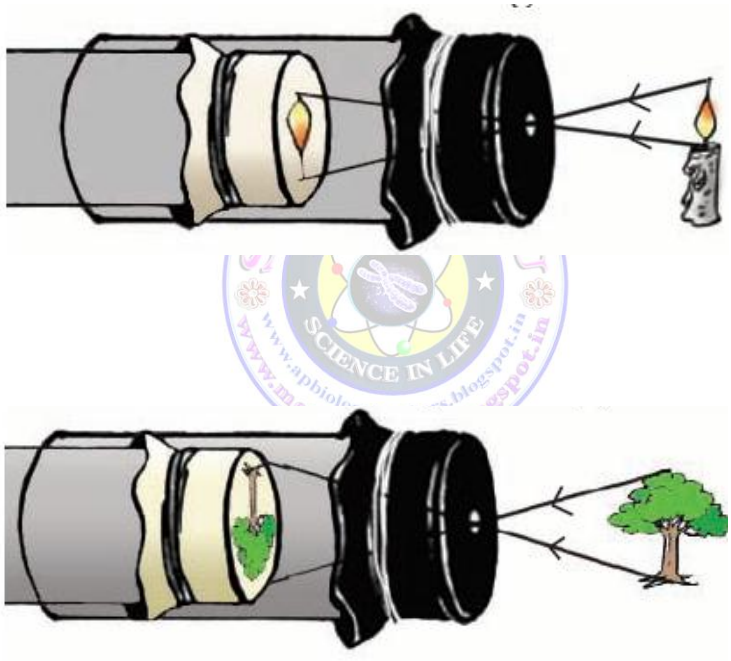
Observation:

1. When we observed the lighted candle in front of the pinhole camera, it is seen upside down.



Conclusion:

1. The nature of straight line motion of light can be understood by pinhole camera.
2. The light from the candle travels straight in all directions from each point of the flame of the candle.
3. Light which comes from the point at the top of the flame goes straight towards the bottom of the screen and light which comes from the point at the bottom goes straight towards the top of the screen.
4. In this way the light coming in a particular direction from each point of the flame will be able to enter into the pinhole, and light going in other directions is blocked by the black sheet.
5. This leads to the formation of inverted image.



ACTIVITY 30

RESPONSE TO STIMULI

Aim: To prove that the earth warms respond to stimuli.

Materials required: A glass jar, black paper, earth warm and a torch light.

Precautions:

1. Collected only one earth warm for the experiment and not disturbed others.
2. Left the earth warm to is habitat after the experiment.

Procedure:

1. Collected an earth warm from moist soil
2. Taken a glass jar and covered half of the glass jar with black paper.
3. Put some soil in the jar and put the earth worm in it.
4. Closed the jar with a lid that contains small holes, to allow air into the jar.
5. When earth worm crawls out of the covered portion, shed some light on the jar and noted the observations.

Observation:

1. When we shed light on the earth warm, it moves to the dark portion.

Conclusion:

1. In the above experiment the earth worm shows response to the stimulus by moving away from the light.
2. Here the light is the stimulus and moving away is the response.
3. Response to stimuli is the most specific feature of living organisms.

ACTIVITY 31

BREAD MOULD

Aim: To examine Rhizopus or common mould under microscope.

Materials required: Mould sample, plain glass slide, cover slip, water, disposal gloves.

Preparation of mould: Taken a slice of bread, covered it with a vessel leaving it undisturbed for two or three days.

Precautions: The mould takes three to four days to completely develop. So the bread slice has to be left for three to four days undisturbed.

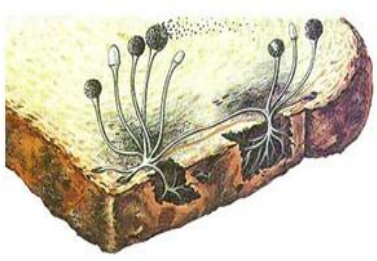
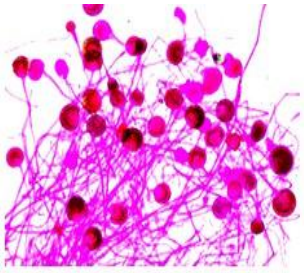
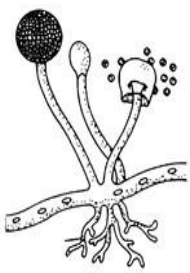
Procedure:

1. Collect sample bread piece with mould and place a drop of water in the center of the slide.
2. Using a toothpick, scrape very little of the mould and place it on the drop of water.
3. Take the cover slip and set it at an angle to the slide so that one edge of it touches the water drop, then carefully lower it over the drop so that the cover slip covers the specimen without trapping air bubbles underneath.
4. Use the corner of a tissue paper or blotting paper to blot up any excess water at the edge of cover slip.
5. View the slide with a compound microscope, observe and draw the diagram.

Observations: A fine thread like structures and knob like structures are observed. The threads are called hyphae and knob like structures are called sporangia.

Details:

1. Each sporangium contains hundreds of minute spores. From the spores new bread mould is developed.

ACTIVITY 32

BACTERIA IN BUTTER MILK

Aim: To observe the bacteria in butter milk.
Materials required: Butter milk, slide, water and microscope.

Procedure:

1. Taken two drops of butter milk on a slide and placed and placed another slide on it to spread.
2. Observed the slide under the compound microscope and drawn the diagrams.

Observation: A number of small rod shaped, minute bacteria are observed.

Details:

1. The micro-organisms that we have seen under microscope are called bacteria.
2. They are in different shapes.
3. The bacteria in curd are useful micro-organism that helps to convert milk into curd.

ACTIVITY 33

MICRO-ORGANISMS IN WATER

Aim: To observe the micro-organisms in pond water.

Materials required: Slide and Microscope.

Precautions: We have to be careful while collecting the pond water.

Procedure:

1. Collected water samples from a pond and kept them separately.
2. Put a drop of water on a slide and kept another slide on it.
3. Observed this slide under microscope and drawn the diagrams.

Observation: Different small and minute micro-organisms are observed under microscope.

Details:

1. There are so many microorganisms in the water like Amoeba, Paramecium, Euglena, etc.
2. So the micro-organisms are present everywhere i.e. in soil, in the water and in the air.