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What do Animals Eat ?

Kartik has a pet dog. He loves playing with it by tossing it a ball or biscuits or even sometimes some small leaves and twigs. He observes that the dog sniffs and catches the biscuit in mid air and eats it up very quickly, while it just holds the ball in its mouth and only sniffs the leaves. If the dog is given milk it first sniffs it and then licks it up quickly.

- Kartik often wonders what the dog is trying to find out by sniffing.
- Why do dogs first sniff food before they eat it?

In the previous chapter we talked about our own food and the different varieties eaten by us. There are a wide variety of animals in the living world and they too eat a wide variety of food items. Let's see how animals eat their food.

Activity-1: Taking in food

You can see many animals in your surroundings. Discuss about them with your friends. Make a list of what they usually eat and what they usually do to find their food. Do not be in a hurry to complete this table. Keep adding to this



Fig. 1 (a)

list as you observe animals around you everyday. But don't forget to observe animals wherever you go.



Fig. 1 (b)

The first animals evolved about 600 million years ago during the late Precambrian.

Table 1

| S. No. | Animal/Bird | What they eat/ drink | How they find food |
|--------|-------------|----------------------|----------------------|
| 1 | Sparrow | Worms, grains, ... | Looking, seeing, ... |
| 2 | Dog | Bones, bread | Sniffing |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

- Which of the animals, listed by you, eat nearly the same type of food?
 - What are the types of food that your pet animals eat?
 - Write about any two animals in your list, describing the food types eaten by them and how they get their food?
 - Compare the types of food habits of two animals selected by you.
- Regarding the types of food eaten by animals, what major groups can be made? Discuss with your friends and write. You could write like this :
1. Some animals depend only on plants for food.
 2.
 3.
 4.

Animals are divided into six basic groups which include amphibians, birds, fishes, invertebrates, mammals and reptiles.

We have seen that all animals depend on different types of food. Now let us do the above exercise in a slightly different manner. Add your own examples in the last column of table 2.

Table 2

| S.No. | Food group | Examples |
|-------|--------------|-------------------|
| 1. | Only plants | Cow, ... |
| 2. | Only animals | Fox, ... |
| 3. | Both | Human beings, ... |

Look at table 2 and try to answer the following :

- Which group of members have an advantage in finding food? Why do you think so?
- Could the animals in food group 3 depend only on plants if animals were not available? Why?
- What will happen if all animals eat only plants?

Do you know?

Animals that depend only on plants for food are called **herbivores**. Animals that depend on other animals for food are called **carnivores**. Animals that take food from plants and animals are called **omnivores**.

- Suppose omnivorous animals start depending only on plants. Discuss and write how it could affect nature.

We know that animals have their own ways of gathering and taking in food. Let us see how they do this.

From finding food to eating it

Plants and animals are the main sources of food in our surroundings. Like us, animals also depend on these sources of food. Every animal has its own style of getting food. They track down, collect, grab or hunt and then use various tools to finally take food into the mouth.

Tracking down food

Most animals feed regularly but, first, they must locate food. To do this, they use a wide range of senses - smell, sight, hearing, taste and touch. Some animals rely more on one sense than the other and it can therefore be highly developed in them.

There are approximately 5,400 species of mammals alive today.

Let us consider some examples to understand this better.

- What do you think the dog does to find its food? Which sense of the dog, do you think, is more developed?
- What about the vultures that fly high above in the sky yet find their food on the ground? Which sense do they mainly use in finding their food?
- How do bats find their food at night?

Thus we have seen that animals use some senses more strongly than others to find their food. For example, dogs use the sense of smell while vultures use vision. Bats depend more on hearing while some reptiles, on taste.

If you ever go near a pond, observe the pond skaters there (Fig. 2). Observe how quickly they move from one side of the pond to another to catch an insect that falls in water.

Pond skaters (an insect which feeds on other insects) detect ripples produced in water by any other insect trapped on the water surface. They compare the ripples on the opposite side of the pond, caused by the legs of the insect struggling to move out, calculate the distance and set out to grab it!



Fig. 2

Collecting food

Finding food is one thing, but collecting or capturing it is quite another. Many animals have specialized body parts such as mouthparts, hands or feet that help them collect their food most efficiently.



Fig. 3

Most animals are motile (capable of movement). One exception is the sponges, which are considered to be sedentary for most of their life cycle.

Activity-2

In the list given in table 3, write the bodyparts of animals that are used to collect or capture food.

Table 3

| S. No. | Animal | Bodypart used in taking in food |
|--------|--------------|---------------------------------|
| 1. | Hen | Beak, ... |
| 2. | Cow | |
| 3. | Dog | |
| 4. | Frog | |
| 5. | Snake | |
| 6. | Man | |
| 7. | Lizard | |
| 8. | Vulture | |
| 9. | Lion | Legs, claws, mouth, ... |
| 10. | Humming bird | |

Look at table 3 and answer :

- Which animals use similar parts in taking in food?
- Compare the parts of dog to that of rat. Note down the similarities as well as differences observed by you.
- Compare the parts of hen and humming bird in taking in food. Note down the similarities as well as differences observed by you.

- What are the similarities between a dog and a lion in the parts involved in taking in food?
 - What are the similarities and differences between a vulture and a lion in their mode of taking in food?
 - You may also add any other observations you may have made.
- You will see that the same part may be used in different ways by different animals. For example, tongue may be

All animals are heterotrophs which means they cannot produce their own food.

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used by dog in a different manner as compared to frog. The dog licks with it while frog captures and swallows food with it.

Also, different parts may be used to take in the same type of food, like, hens use their beaks to pick insects while frogs use their tongues for the same purpose.

The same part in a similar group of animals may be used in ways that can

be largely different. For example, beaks of different birds are used to eat different types of food.

Let us take some specific examples to observe how animals eat their food. The type of food and the ways in which an animal collects it, form the food habit of the organism.

Let us study the food habits of birds in detail. How do birds eat their food?

Look at (Fig. 4) and choose the correct

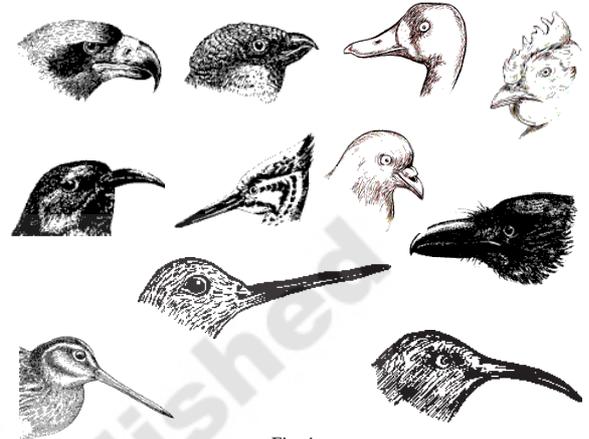


Fig. 4

The largest animal alive today is the blue whale.

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options from statements 1, 2 and 3 given below.

1. The reason for the beaks of different birds being different is to make it easy to recognize them.
2. There is no reason for the difference, it just happens.
3. The beaks are different because the birds eat different kinds of food.

Again look at Fig. 4 and try to answer :

- Which two of the given birds (sparrow, duck, eagle, dove) would eat the same kind of food according to you?
- Why do you think they might eat the same kind of food?

Activity-3: Picking food with beaks

We see hens and crows in our surroundings searching for food.

Do you find any similarities, and dissimilarities in the way and type of food eaten by hen and crow? What are they? Write your observations in table 4.

Table 4

| S.No. | Similarities | Dissimilarities |
|-------|--------------|--------------------------------------------------------------|
| 1. | use beak | hens scratch the ground with feet and eat worms, crows don't |
| 2. | | |
| 3. | | |

Woodpeckers have a long and strong beak. By using this beak they remove layers of bark and eat ants and pests which lie under the bark. Crane has a long beak to catch fish in water. Have you ever seen vultures? They have strong hooked beaks to tear flesh off animals.

Parrot, which eats fruits and cracks nuts, has a hooked beak, while the crow doesn't have it. Not only the beak, there are other parts as well that are different to suit the type of food eaten by a bird.

Vultures would need sharp claws along with strong hooked beaks to tear flesh, while the humming bird that sucks nectar would need a long thin beak and does not need sharp claws.

Activity-4: Picture Collection

Prepare a booklet on birds and their food habits. Collect pictures of different birds. Write the way in which each bird gets its food.

Do you know?

Crows that live in our surroundings usually eat waste and rotten food material, dead animals etc. They keep our surroundings clean in this manner. So they are called natural scavengers. Vultures are also called so due to the type of food they eat.

Blue whale weighs in the range of 110 to 160 tonnes and grows to lengths of between 20 and 30 meters.

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Activity-5: How does a frog get its food

It is very interesting to watch a frog get its food. A frog throws out its sticky tongue towards an insect. The insect gets stuck on the frog's tongue. Then the frog swallows it.

- Find out where a frog lives and how it feeds there.
- Observe how a lizard catches its food. Write down your observations.
- Find out the differences between a frog and a lizard's way of taking in food. How do these animals use their tongue?

Activity-6: How does a cow get its food

We know that many animals like the cow depend on plants for food. They are herbivores. Animals like cow, goat, buffalo, sheep, giraffe, camel, elephant, deer etc. eat different parts of plants like green/dry grass, leaves and branches.

Observe a cow or buffalo while it is eating its food. Write your observations in your note book.

- What does a cow do to find its food?
- Note the parts of its body involved.

- How does the cow start eating?
- Which are the parts of the cows' mouth (jaws, teeth, tongue etc) involved in eating its food?
- Do cows have teeth? Do they have teeth on both jaws? (ask someone who tends a cow to find this).
- You may have observed cows and buffaloes sitting under the trees and moving their jaws. Do you know why they do that?

Do you know?

Animals like cow, buffalo, camel etc., chew food very quickly and swallow and store it in a part of their stomach. After sometime they take food material back from the stomach to the mouth and chew it again. This process is called **rumination**.

How much and how little!

Generally elephants eat leaves, branches of plants, fruits etc., which are available in the forest. Think how much of food an elephant needs to eat per day?

The larva of a crane fly eats a lot but after changing to adult, a crane fly doesn't need to eat at all!

Activity-7: How a dog gets its food

Observe a dog in your surroundings. How does it get its food? Write your

Birds evolved from reptiles during the Mesozoic Era about 150 million years ago.

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observations in the space given below.

.....

- What does it do to find food?
- Which parts are involved in taking in food?
- How does a dog eat meat?
- How does a dog drink water?

Dogs eat food by using their sharp teeth and tongue. Wild animals like lion, fox, wolf, tiger and others also have sharp teeth. Can you say how they get their food?



Animals that hunt have strong legs to run, sharp claws to catch and sharp teeth to tear flesh.

Rabbits and squirrels also have teeth. They eat seeds, tubers, leaves etc. by using their teeth.

- Do you know how cats and dogs use their teeth?

We can see sharp teeth in a cat or dog's mouth. They tear flesh of animals by

Many desert animals are nocturnal. They burrow underground to escape the extremely high temperatures in the day and come out at night to feed.

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using these sharp teeth. Did you ever see how a cat hunts a rat? What do you feel about its concentration and actions while hunting?

Activity-8: Using tongues

Compare how a frog, cow and dog use their tongues

Animal Use of tongue

Frog
 Cow
 Dog

Getting food without hunting:-

Some animals get their food by hunting and some others do not hunt. Write about the way in which at least two animals that do not hunt, get their food.

It is very interesting to watch how a duck catches its food. Ducks also have teeth, but they are not like the teeth of a cow or lion. They are not useful in grinding food. They act as filters to get food from water.



Similarly, fish too have teeth which are used for the same purpose as that of ducks.

How leeches get their food

When we walk on the banks of ponds,

canals etc. we can see different kinds of animals. We can see leeches, snails, earth worms etc.

People in rural areas are familiar with leeches. While rearing cattle near water they find leeches on the skin of animals. Leeches stick on the skin and suck the blood of cattle as well as humans. They have special structures called suckers in their mouth to do this.

Do snails and earthworms also suck something from the ground? Discuss this with your teacher and your friends.

Activity-9: Modes of getting food

Observe the following animals in your surroundings. Find out how they get their food. Observe them everyday for at least a week. Write whatever you observe in your notebook display and it on your wall magazine.

1. Lizard on the wall
2. Spider in a Web
3. Hen in the garden
4. Butterfly on a flower.

Do you know?

Some animals search for their food only at night. Cockroaches, desert lizards, rats, owls, bats, moths, crickets etc. get their food only at nights. During daytime they hide in dark places. These type of animals are called **nocturnals**.

The leopard (Panthera pardus) is a member of the cat family (Felidae) The lifespan of a leopard is between 12 and 17 years.

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Food Chain

There is a great balance in nature established among different plants and animals regarding their food habits. What will happen if all animals eat plants? To maintain a balance in nature animals follow their food habits. See Fig. 5. What do you find?

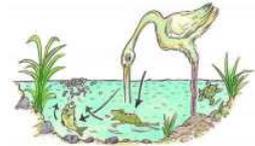


Fig. 5

In a pond, we can see that eggs and larvae are eaten by fish and frogs. Fish and frogs are food for a crane. Think, who can eat the crane?

Activity-10: Food Chains

Look at Fig. 5 and write your observations.

.....

Now, try to draw a food chain that starts from grass and ends in a cat.

Food chains cannot always be represented by a straight line. They can be branched with several food chains

connected to each other in the form of a web. Look at the following. Draw connections to show which animal is eaten by whom. It will surprise you!

| | | |
|-------|-------|-------|
| Rat | Cat | Lion |
| Grass | Deer | Fox |
| Dog | Tiger | Hen |
| Wolf | Man | Worms |



Like us ants are good farmers as well they cut leaves into pieces and create a bed to grow a type of fungus which they eat!

Think! What can we learn from ants? Write your opinion in your notebook.

Keywords

Food habit, food chain, sucking, picking, chewing, habitat, carnivore, herbivore, omnivore, nocturnal, rumination

What we have learnt

- Different types of animals that live in our surroundings have their own food habits (way of taking in food and type of food taken).
- Sucking, licking, picking, chewing, peeling, swallowing are all the ways by which animals take in their food.
- Beaks of birds differ from one another depending upon the type of food they eat.
- Most wild animals that eat other animals have sharp teeth.

Birds are vertebrates (internal) animals. They all have a backbone.

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- Animals are divided into three types on the basis of their food. They are carnivores, herbivores, omnivores.
- Food chain is the connection between animals on the basis of their food habits.
- Food chain explains the interdependence of diverse organisms in nature.

Improve your learning

1. Name some animals in your house which have the same kind of food habit.
2. Observe your surroundings or go to a nearby field and write about the following :
 - (a) How does the cow eat grass?
 - (b) What tools are used while doing so?
 - (c) In what way can you justify it is a herbivore?
3. Compare the legs and nails of a dog and hen and say why they are different.
4. Go to a nearby pond where cranes are usually seen. Observe how they catch fish. Write about the process of catching fish. (Take care of yourself when you are near water places.)

5. Name some animals which use tongue as a tool for taking in food.
6. The butterfly uses.....to suck honey from flowers.
7. Do the following and record your observations :

Collect one or two earthworms and put them in a bottle containing wet soil. Close it with a lid which has holes. Observe how earthworms get their food.

8. Which animals in the forest depend on only plants or only animals for food?
9. Fill up the following table

| Bodypart used to collect food | Examples |
|-------------------------------|-----------|
| Beak | Hens, ... |
| Tongue | |
| Teeth | |
| Sucker | |
| Strong legs with claws | |

10. Why do most carnivores live in forests? Give reasons.
11. Make your own food chain and display it in your class room.
12. Prepare a scrap book of animals and separate them into carnivores, omnivores and herbivores.

Birds have wings and they can fly. Some of them can't fly; penguins, ostrich, emu and rhea. They have hollow bones to save weight.

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13. Identify which of the following statements are wrong and give reasons.
- That which lives in water cannot eat animals.
 - Elephants and deer are herbivores living in the forest.
 - Birds' beaks are designed to suit their food habits.
 - Sharp claws are useful for hunting.
 - Most of the food chains end with herbivores animals.
14. If you want to understand more about food chain what questions would you like to ask?
15. Write a play with dialogues between a parrot and a lion about their food habits and organs they use to get food. Act it with your friends. Send it to school / district childrens magazine.
16. Identify the given animal :
- What does it eat?
 - Which part of the body helps it in eating?



Every creature is better alive than dead, men and mouse and mango tree, and he who understands it alright will rather preserve it's life then destroy it

..... Saleem Ali

A rat can last longer without water than a camel can.

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Table 2

| S.No | Object | Material |
|------|--------------|-----------------------------|
| 1 | Door | Wood, metal, rubber, paint. |
| 2 | Towel | |
| 3 | Bicycle | |
| 4 | Knife | |
| 5 | Mirror | |
| 6 | Shoes | |
| 7 | Water bottle | |
| 8 | Pot | |

- Which objects are made of only one material?
- Which objects are made of more than one material?
- How many types of materials can be used for making chairs?

List them in the space given below.

There are many objects in our surroundings such as chairs, tables, cycles, bullock carts, utensils, clothes, tyres, water, stones, etc.

We see that different objects are made of different materials. Some objects are made of more than one material. Think of some objects made of more than one material.

Activity -2: Finding the objects made from different materials

Name as many things/objects as you can, made using the materials given in table 3.



Fig. 2

When white light shines on an object it may be reflected, absorbed, or transmitted.

MATERIALS AND THINGS

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5

Materials and Things

Mary was sitting in her room and studying. Suddenly she heard a loud sound from the kitchen. Mary went to the kitchen and saw a cat running away.

- Can you guess what could have happened? Write it down in your note book.

Mary saw that many objects had fallen on the floor. Some of them were broken and some were not. Can you guess which objects might have broken and which might not have broken? Fill in table 1.



Table 1 Fig. 1

| | |
|------------------------------------|----------------------------|
| Objects that would have broken | Cup, ... |
| Objects that would not have broken | Stainless steel glass, ... |

- Can you decide why some objects broke and some did not?

Activity-1: Finding the materials used to make different objects

In our day to day life, we use several objects for different activities. These objects are made of different materials.

For example body of your pen is made of plastic, where as its clip is made of Iron

A list of things in a house are given in table 2. Name the materials from which each object may possibly be made of :

(If you don't know which material the object is made of, discuss with your friends and find out.)

The color of a transparent object depends on the color of light it transmits.

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Table 3

| S. No. | Material | Things/Objects |
|--------|----------|----------------|
| 1 | Metal | Utensils, |
| 2 | Plastic | Bag, |
| 3 | Glass | Mirror, |
| 4 | Wood | Table, |
| 5 | Cotton | Cloth, |
| 6 | Leather | Shoes, |
| 7 | Ceramic | Cup, |
| 8 | Rock | Idols, |

We see that the same material can be used to make different objects (Fig. 3). Each object is used for a special purpose. So we need to know the properties of materials, as well as the properties of the objects to decide which material should be used for making an object. Some materials are soft and some are hard. Similarly some are shiny whereas some are non-shiny. Depending on these properties materials are used for different objects.

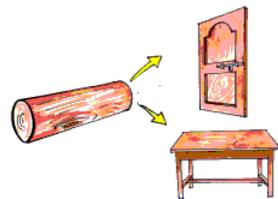


Fig. 3

Discuss the following:

- How can we classify materials?
- How do we decide which material should be used for making an object?

We use different materials for different purposes based on their properties.

We do not actually see colors. What we see as color is the effect of light shining on an object.

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Properties of Materials

- What type of material can you use to make a window when you don't want someone to see through it?
- What type of material can you use to make a window when you want to see through it?
- Can you make a cricket ball with mud or glass?
- Can you make a chair with glass or mud? If not why?

Let us examine the properties of materials and their usage. We begin with properties that we easily recognize and understand.

Transparency

Why do shop keepers usually store eatables like sweets and biscuits in glass jars? The shopkeeper wants his customers to be able to see these items! We all know that we can easily see through glass. Such materials are said to be **transparent**.

Can you see through plastic? Can you see through wood?

We cannot see through some materials like wood, steel, card board. Such materials are said to be **opaque**.

Activity-3: Identifying transparent and opaque objects

Prepare a list of objects around you and find which of them are transparent and which are opaque. Write them in table 4.

Table 4

| Objects | Transparent or Opaque |
|-------------|-----------------------|
| Glass jar | Transparent |
| Steel glass | Opaque |
| | |
| | |
| | |
| | |



Fig. 4

Actually, objects sink or float because their density is more or less than the density of whatever medium they are floating in.

Activity-4: Are we able to See through a paper

Take a sheet of white paper and try to see a lighted bulb through it (Fig. 5). Record your observation. Now put a few drops of oil on that sheet and again try to see the bulb through it (Fig. 6). What difference do you notice?



Fig. 5

Fig. 6

You notice that in the first case you can't see the bulb but in second case you are able to see the bulb.

The materials through which we can see objects, but not very clearly, are said to be **translucent**. Oily paper is an example of a translucent substance.

Some glass panes fixed to windows allow some light to come through but you can't see clearly through them; such type of glass is translucent glass.

Can you give some more examples of translucent objects?

Try This

- Take a torch, switch it on and see. Does the light pass through the torch glass?
- Now cover the torch glass with your palm. What do you observe?

- Now cover the torch glass with oily paper. What do you observe?

In the above activity, when do you observe transparent, translucent, and opaque property? Discuss.

State of the materials

In the chapter on rain you have studied the relationship between ice, water and water vapour, the three states of water. You would have noticed that when ice is added to a glass of lemon juice, the ice begins to melt and after some time all of it becomes water and the outer surface of the glass becomes wet.

If we heat the water in a vessel we notice that after some time water vapour is produced. If heating is continued, more and more vapour is produced in the form of steam and the quantity of water in the vessel keeps decreasing.

Some materials change their state from solid to liquid, liquid to gas on being heated and from gas to liquid, liquid to solid on being cooled. We sort materials as solids, liquids or gases based on their state at normal temperature.

Can you think of any material other than ice that goes from solid to liquid, liquid to gas (vapour)?

Activity-5: Light a candle

You may have lit a candle with a matchstick many times, holding the burning matchstick to touch the wick of the candle until the wick catches fire. But can you light the candle without

Water has a density of 1g/ml therefore if you had an object with a density less than 1g/ml it will float.

touching the wick with a burning matchstick?

Do you think this is impossible? Let us see how it can be done.

Place a candle in a safe place and light it. The first time, the candle cannot be lit without touching the wick with the burning matchstick. So do just that the first time. Let the candle burn for some time.

After about two minutes, hold a burning matchstick in one hand and blow the candle out. What did you notice? Did you see a column of white smoke rising from the wick as soon as you extinguished the flame?



Fig. 7

Now quickly bring the burning matchstick close to this smoke, but do not touch the wick with it. What happens?

- Did the candle not catch fire from a distance?

If you wish, you can make a game of this. See which student in your class can light the candle from the farthest distance.

Discuss with your friends how and why the candle got lit from a distance.

- Does the white smoke represent candle wax in the state of gas?

How can you know the different states of materials?

We observe that certain materials can change their shape according to the shape of the containers they are put into, while some retain their shape. Those materials which change shape are mainly **liquids** such as water, rasam, milk, oil, kerosene, etc. Those materials which do not change shape are **solids** such as wood, rock, brick, plastic objects, and vegetables etc.

Activity-6: Classification of Materials

Think of different solids, liquids and gases around you and group them in table 5.

Table 5

| Solids | Liquids | Gases |
|--------|---------|-------|
| Stone | Milk | Smoke |
| | | |
| | | |
| | | |
| | | |

Water is more dense than ice. It's the **CRYSTALLINE STRUCTURE** that makes ice less dense,

Discuss with your friends and find out who had the longest list. Now consider only one group, say liquids, from the observation of liquids can you list their properties? For example, liquids take the shape of the container they are put into. Write all possible properties of solids, liquids and gases in your notebook. Discuss about them with your friends and teachers.

A sweet dilemma

While thinking about properties of solids, a group of students in class 6, put sugar in a glass, in a bowl and in a vessel. They observed that sugar takes the shape of the container. Since they know that liquids take the shape of the container, they concluded that sugar is a liquid.

The second group in the class disagreed with the first. What do you think? Is sugar a solid or a liquid? How will you decide? Razia, a student from the second group came up with an idea. She took a single crystal of sugar and one drop of water and declared that sugar is a solid while water is a liquid. The first group also had to agree with her argument.

- What must she have argued using only one crystal of sugar and one drop of water?

Discuss with your friends and find out why sugar is a solid although it takes the shape of the container.

- Is common salt a solid or a liquid?

Activity-7: Sinking or floating in water

Let us assume that a tomato, brinjal, potato, iron nail, sponge, wood, stone, leaf, piece of chalk and paper are given to you. Predict which of them sink or float in water. Record your predictions in table 6.

Table 6

| Prediction | Object |
|------------|-----------|
| Sinks | Stone ... |
| Floats | |

Now try to test whether your predictions are correct or wrong by dropping the above objects in a beaker of water one by one. What do you find record your observations in the following table.

| Object | Prediction | Finding |
|--------|------------|---------|
| | | |
| | | |
| | | |



Fig. 8

The word candle is derived from the Latin word *candere*, meaning to shine.

For which objects is your prediction wrong? Why?

Now, add a lot of salt to the water in the beaker. Try this same activity with water which is excessively salty.

- What do you observe?
- Do you get the same result? Discuss.

Activity 8: Do iron objects float?

Take some water in a wide mouthed bowl. Put an iron nail in it. What do you observe? Put an empty iron tin in that bowl. What do you observe?

Also try to observe whether a wooden piece floats on water. What happens when a wooden bowl is dipped in water?

What do you conclude from this activity? Some materials in one shape will sink in water but float on water when they are in other shape. The materials that can sink can be made to float, but all the materials that float cannot be made to sink.

Activity-9: Soluble or insoluble in water

Take five beakers with water. Take small quantities of sugar, salt, chalk powder, sand and saw dust. Add each material to separate beakers and stir. Observe the changes and record your observations in table 7.

Table 7

| S. No. | Material added | Dissolves (Yes/No) |
|--------|----------------|--------------------|
| 1. | Sugar | |
| 2. | Salt | |
| 3. | Sand | |
| 4. | Saw dust | |
| 5. | Chalk powder | |

We observe that certain materials dissolve when mixed with water. These substances are said to be **soluble** in water. The materials that do not dissolve are said to be **insoluble**. Repeat the activity with different liquids like vinegar, lemon juice, coconut oil and kerosene and add them to water. What do you observe? Discuss with your friends.

Keywords

Material, object, metal, transparent, opaque, translucent, solid, liquid, gas, sink, float, soluble, insoluble

What we have learnt

- Objects around us are made of a large variety of materials.
- Based on their properties, we use different materials for different purposes.

You can't make candles without this ingredient – the wax Beeswax has many desirable benefits including its natural, sweet smell and its smokeless.

- Some materials such as glass are transparent, some materials such as wood are opaque and materials like oily paper are translucent.
- Materials can exist in three important states; as solids, liquids and gases.
- Some materials sink in water and some materials can float on water.
- Some materials are soluble in water and some materials are insoluble in water.
- Materials are grouped together on the basis of similarities and differences in their properties.

Improve your learning

1. Name any five objects which are made up of only one material?
2. Name any five objects which are made up of more than two materials?
3. List five things which we can make using each of the following materials :
 - a. glass
 - b. metal
 - c. plastic
 - d. wood
4. Mary saw a ship travelling on a sea. She knows that iron nail sinks in water. She has many doubts, what are her doubts? Write them.
5. Mary, while examining whether a boiled egg sinks or floats, found

that it floats but Vakula made it sink, How is it possible? Guess and write it.

6. Drop an egg in a beaker of water. Now drop the same egg in another beaker of water in which excessive salt is added. Write your observation.
7. Do the following activities. Write down your observations. What do you conclude.
 - a. Mix chalk powder in water.
 - b. Place a piece of candle in water.
 - c. Add some oil drops to a beaker of water.
8. Make a list of items from your kitchen like utensils, food ingredients etc. classify them as follows.
9. Collect different plastic items from your surroundings. Classify them as transparent, opaque and translucent.

| Item | Sink / Float in water | Soluble / Insoluble in water |
|------|-----------------------|------------------------------|
| | | |
| | | |
| | | |
| | | |

The word candle is derived from the Latin word candere, meaning to shine.

10. Draw different objects made up of wood which we use in our daily life.
11. Make a few models you like using clay.
12. We know that a ship, even though it is made up of tonnes of iron, floats on water. How do you feel about the scientists who found the scientific principles and efforts in making a ship?
13. We use so many wooden items in our daily life. Is it good to use wood? What happens by excessive use of it? What is the reason? Is there any alternative for this?



The Sun, The Moon and The Stars would have disappeared long ago had they happened to be within the reach of predatory human hands.

..... *Havelock Ellis*

If green light passes through a transparent object, the emerging light is green; similarly if red light passes through a transparent object, the emerging light is red.

Tamarind, mango, amla are examples of plants that grow in forests or in the house-gardens or fields.

Plants and animals that live in different places on the land like those living on trees, in our houses, fields, forests etc are said to belong to terrestrial habitat. All habitats on land are collectively known as **terrestrial habitats**.

Now let us do a small activity to see the difference in the ways in which plants and animals adjust or adapt to their surroundings.

A study of the difference between aquatic and terrestrial plants will help us understand this better.

Activity-6: Compare water plants with land plants

Collect an aquatic plant say a hydrilla or vallesneria. Also collect any land plant. Now compare the two and write your observations in table 3.

- On the basis of your observations write how is the aquatic plant suited to living in water?

Diversity of habitats in Andhra Pradesh

The plants that grow in coastal regions differ from those of Telangana or Rayalseema. We can see mangroves only in coastal districts. Grapes are grown in Telangana. Similarly, we can see same type of plants in all places of our state.

Do you know?

Cactus, acacia, aloe vera plants do not need water like chili or jasmine plants. They are called desert plants. We can see camels frequently in the desert. Desert plants and animals are suited to dry conditions and vast temperature differences. Different characteristics in the desert make up desert habitats.

Table 3

| Parts | Terrestrial plant (tulsi) | Aquatic plant (valisneria /hydrilla) |
|--------|---------------------------|--------------------------------------|
| Stem | | |
| Leaf | | |
| Root | | |
| Others | | |

Aquatic habitats come in many forms: lakes, rivers, wetlands, marshes, lagoons, streams, rivers and swamps.

Discuss with your friends and write:

- Do animals change their habitats?
- What about our domestic animals, have their habitats changed?
- Have you seen some birds in your surroundings only during a particular season? Why do they come here?
- Can we see all types of birds throughout the year? We hear songs of cuckoo only in a particular season. We see cranes on trees in rainy season, where do they come from and where do they go at other times?

Good habitat, good life!

Suppose the doors of your house are destroyed somehow? How will you feel? We fail to accept even little changes in our house or surroundings. We feel disturbed. Do we feel the same way for others? We are dumping wastes in nearby ponds, lakes, rivers and grounds and destroying forests on a large scale to set up industries. Think what will happen to all the organisms living in these areas. What will be the result of all this? Don't we depend on different organisms? You have already studied about the interdependence of different organisms. Try to give your answer on

the basis of that. If we harm them wouldn't we be harmed as well?

Think how a good unharmed habitat leads to a better life for us.

Do you know?

Different kinds of birds come from long distances to Kolleru and Pulicat lakes of our state. During the months of October to March, pelicans appear near those lakes. In Kurnool district we can see a bird called battameke pitta which flies over long distances to come here.

Generally we can see birds flying over long distances to find suitable conditions to reproduce. Animals like turtles and fish also move from place to place. Some kinds of turtles move away from coasts of West Bengal and Orissa to the coasts of Vishakhapatnam.

Have you heard about the Pulasa fish? Gather information about them. How and why do they change their habitat in some seasons.

Keywords

Habitat, Terrestrial, Aquatic

What we have learnt

- Habitat is a dwelling place for plants and animals that gives them optimum conditions for life.

Where freshwater mixes with saltwater you'll find mangroves, salt marshes, and mud flats.

- Tree, pond, house are some examples of habitats.
- Temperature, moisture, air, water, food, shelter are the components of a habitat.
- All habitats may be broadly grouped into terrestrial (land) and aquatic (water).
- Several kinds of plants and animals share the same habitat.
- Habitats shows the diversity of nature.
- Habitats are specific to the particular organism living there.
- Birds often change habitat in search of better living conditions. For example, some birds change habitat before laying eggs.
- We must not destroy habitats of other organisms to satisfy our needs; rather we must try to protect them.

Improve your learning

1. What is a habitat?
2. Name some plants and animals that live in terrestrial habitat.
3. Why can't fish live on land?
4. "Animal skin is a habitat for some organisms." What do you understand by this statement?
5. Identify the habitat in which the following live. More than one organism may be present in one

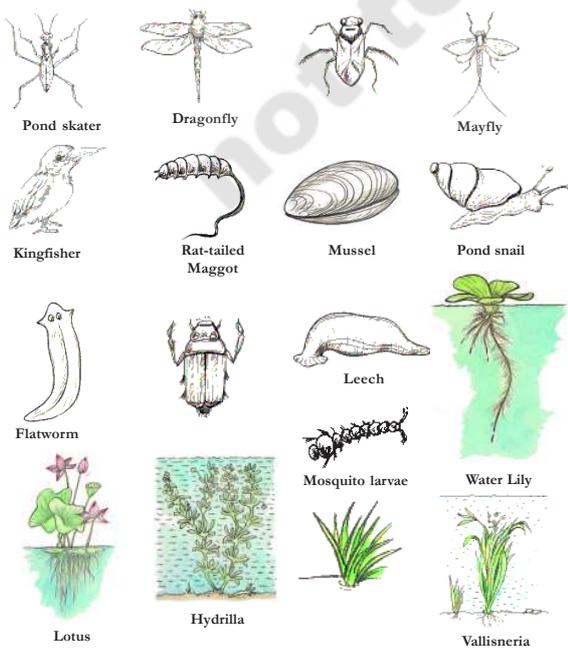
habitat (use information given in the help box)

Our intestine, pond margin, kitchen, garden, tree, underground, grass

6. What happens if a habitat is disturbed or destroyed?
7. Why do some animals change their habitat?
8. Observe a spider in its web and write how a spider shares its habitat.
9. Collect a hydrilla plant. Put it in a glass of water and observe for a week how it grows.
10. Take a map of Andhra Pradesh and colour the areas where mangroves grow.
11. "I am a living being. I have four legs. I live in water and also on land." Who am I? And guess who are there in my habitat along with me.
12. Write your experiences with your pet dog / cat / cow etc. that shows its affection on you.
13. Raziya doesn't want to disturb squirrels that eat fruits on the guava tree at her house. Why does she do so?
14. Prepare a map that represents different habitats which exist in your school.
15. Prepare an article to deliver a speech in Literary Association meeting on "Animals also have right to live."

Seas and oceans stretch from pole to pole and reach around the globe. They cover more than 70 percent of the Earth's surface and hold in excess of 300 million cubic miles of water.

16. Pictures of different kinds of plants and animals which live in plants and lakes in our surroundings are given below for you. Try to know their local names with the help of your teacher and write them in your note book.



Where water meets land, a diverse array of animals and wildlife gather to feed, reproduce, and seek out shelter.

7

Separation of Substances

Hemanth's mother sent him to a grocery store to buy grocery and vegetables. He purchased green chilli, coriander seeds, tomato, red gram, wheat flour and kept them safely in a bag. While returning home he fell on the ground and all the items in the bag got mixed.

How will he separate them now? Which material will he separate first? How would he separate tomato and chilli? How would he separate wheat flour? How would he separate coriander seeds?



Fig. 1

tea? List them in table 1. and also list out the different substances that are used to make the items given in table 1.



Fig. 2

Table 1

| Item | Substances |
|-------------|------------|
| Tea | Milk, ... |
| Laddu | |
| Lemon Juice | |
| Concrete | |
| Soil | |

We separate components in mixtures for different purposes in our daily life. For example, we remove small stones from rice before cooking, remove worms and dust from flour before preparing roti. Similarly we separate impurities from water, tea leaves from tea etc.

Mixtures

Have you observed tea being prepared? What substances are used for preparing

The above items are **mixtures** as they contain more than one substance. Combination of more than one

The natural variety, Japan camphor, is obtained by steam distillation of the wood of the camphor tree (*Cinnamomum camphora*)

substance forms a mixture. Some mixtures are natural like soil. Some mixtures are man-made like laddu, lemon juice etc.

Write in table 2 some mixtures that you know and their components. Also mention whether they are natural or man-made.

Table 2

| Mixture | Components | Natural / Man made |
|-------------|---------------------------|--------------------|
| Lemon water | Lemon juice, sugar, water | Man-made |
| | | |
| | | |

- Identify the mixtures among the following : Jangree, coffee, sand, haldi, red chilli
- From which mixture in the examples mentioned above are you able to separate components?



Fig. 3

You have studied about materials and their properties in a previous chapter. We make use of several properties of the materials for separating the desired items from the mixture.

You might come across some situations where you have to separate some components from a mixture. Write down two examples of such situations.

- _____
- _____

Activity-1: Use of water in separation

Collect some solid materials such as ghee, wax, sand, sugar, salt, haldi, dal, plastic, wood, iron nails. Take a bucketful of water and a beaker. Now try to discover the following.

- Which materials float on water?
- Which materials sink in water?
- Which materials are soluble in water?
- Which materials are not soluble in water?

A vitamin is a substance that makes you ill if you don't eat it.

What do you do to separate the components?

- Were you able to separate each component from the mixture?
- Are the methods used to separate the components the same in all these instances?
- What are the properties of the components that are used, in separating them?

- Can you separate salt from sand in this manner? What differences in the properties of rice, pulses and stone help us in separating them by the above method?

Sonu gave following examples for hand picking method of separation.

- Rotten fruits are removed from fresh fruits.
 - Separating oranges and apples.
- Try to give some more examples where the hand-picking method is used.

- _____
- _____
- _____

Methods of Separation

We will discuss some simple methods of separating substances that are mixed together. You may come across some of these methods being used in your day to day life.

Hand Picking



Fig. 4

- How are stones separated from pulses and rice?

Stones are separated by **hand picking** from rice and pulses (see fig. 4).

Winnowing

When farmers thresh their crops, they get a mixture of husk and grain. How do the farmers separate the husk from the grains?

On a windy day, a farmer stands on a high platform and allows the mixture of grain and husk to drop slowly from the flat pan. The wind carries the husk forward and the grains fall vertically downward. A separate heap of grain is formed (Fig. 5).

Concrete is the combination of sand, stones, and cement, which is filled in Iron frames.



Fig. 5

- What property helped in separating the husk from grain?

Husk is very light as compared to the grains, and farmers use this property.

Activity-2: Sedimentation and decantation

Take a mixture of soil and water in a glass tumbler and keep it undisturbed for sometime. What do you observe?

You will find that the sand and the mud particles in the soil settle down at the bottom of the glass tumbler (Fig 6(a)). These are called sediments. This process of separation of mud and sand is called **sedimentation**.

After sedimentation, the tumbler is gently lifted. The tip of the tumbler is inclined on the edge of another tumbler without disturbing the sediments (Fig.

6 (b)). The water gets separated from the sediment(mud). This process is called **decantation**.



Fig. 6 (a)

Fig. 6 (b)

- Why did mud particle settle at the bottom of the tumbler?
- Laxmi says that sedimentation and decantation are used at home while cleaning rice and pulses for cooking. Describe the sediments in this process.
- Think of other examples where we use this method of separation and list them.

Sieving and filtration

- How will you separate the tea-leaves from tea?

Tea-leaves are separated from tea using a strainer. Which property helped in separation of tea-leaves from tea?

You must have seen flour being sieved in the kitchen (Fig. 7). The flour particles are very fine and pass through the holes

of a sieve, but the husk particles being large are left on the sieve.



Fig. 7

We use sieves to separate tea leaves from tea and sand from gravel. What are the differences between the sieves used in the two instances?

Do you know?

Farmers separate grains which are bigger in size from the smaller ones by sieving. The bigger grains are then used as seeds or sold at higher price

Can you separate mud from muddy water using a sieve? How small should the pores of the sieve be to do this? Use a cloth as a sieve and try to do this.

- Is the water clear after sieving?
- Gowthami filtered mud water with a filter paper. Can you do it? (See Fig. 8)

- After using the filter paper to filter water what do you find? What do you see left behind on the paper? What is obtained in the beaker?



Fig. 8

Filter paper

Filter paper is a sieve made of paper which has very fine holes. We can filter very small particles using this type of sieve.

Activity-2: Why can't we filter salt from salt water

- Take water in a beaker. Dissolve some salt in it. Filter this mixture with a filter paper. Were you able to separate the salt from the salt water?
- Why could you not filter the salt from salt water?

You can walk on waters of Dead Sea it is a salt lake bordering Jordan to the east and Israel and the West Bank to the west.

Handpicking is an excellent method of controlling pests especially when only a few plants are infested.

The pores in a filter paper are so minute that we cannot see them with naked eyes. Think, how small should the particles of salt dissolved in water be if they are to pass through filter paper!

Activity-3: Crystallization

Heat some salt water in a beaker, over a flame. Stir the solution with a glass rod (Fig. 9). Continue heating till all the water in the beaker has evaporated. What is left behind in the dish? You will find salt crystals and powder in the dish.



Fig. 9

Do you Know?

Water is generally evaporated in sunlight. We use this property while extracting salt from sea water. Sea water is captured in wide pans and is exposed to air and sunlight. Then water evaporates and the salt is left behind in the pans.



Fig. 10

Distillation

Before administering injections to patients, doctors mix injection powder with some liquid. What is it? Is it water or any other liquid?

This is water and it is known as distilled water. Where does this distilled water (pure water) come from?

- Do you know the process of distilling water?

Activity-4: Get your own distilled water

Fill a conical flask with water, close it with a cork having a hole. Insert a glass tube through the hole. Take another conical flask with a cork having a hole and insert another glass tube through it. Connect both tubes with a plastic tube. Now heat the flask containing water using a burner (Fig. 11).

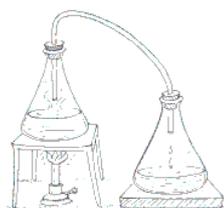


Fig. 11

After some time, water vapour goes into the second conical flask through the glass tube. The water vapour will slowly turn to water. The water in the second conical flask is called distilled water. It is free from impurities.

Sublimation

In order to separate the components of a mixture we make use of their difference in color, shape, size, weight, solubility.

- Can we use these features for separating mixtures of powdered salt and camphor?
- What other properties can we use?

Activity-5: Sublimation of camphor

Take a mixture of camphor and powdered salt in a china dish and cover it with a funnel. Close the tube of the funnel with cotton. Place the dish on a stand and heat it with a burner (Fig. 12).



Fig. 12

• What do you observe in the dish? When camphor is heated, it transforms to gaseous form without changing into liquid. Similarly, on cooling, the gaseous form of camphor changes directly into a solid without going to the liquid state. The process in which a substance changes directly from solid to gaseous form and vice-versa is called **sublimation**.

Chromatography: A novel method of separation

Can we separate colours from a mixture of colours? Let us do an interesting activity.

Activity-6: A chalk with different colors

Take a whole stick of white chalk. Around the curved surface of the chalk put an ink mark with blue or black ink.

Now pour some water in a plate and keep the piece of chalk in the water (Fig. 13). Ensure that the water in the plate is very little and does not touch the ink.

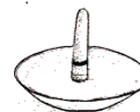


Fig. 13

Soil and rock layers naturally filter the ground water to a high degree of clarity.

Chilka lake is the India's largest salt water lake

Now observe the color patterns that form on the piece of chalk after some time.

- Does chalk absorb water?
- Can you find any change in ink mark on the chalk?

Remove the chalk before the water reaches its top. Which colours do you see on the chalk from the bottom to top? Draw a picture of the chalk in your notebook and the colours you have seen on the chalk. From where did these colours come?

The ink appears to be made of a single colour but it is actually a mixture of many colours hidden in it. This method is an example of chromatography. Try to do chromatography with different inks and find out which colours they contain.

- Where do we use the chromatography method?

We know that a leaf is green in colour. Try to find whether the leaf consists of only one colour or more than one colour?

Separation using more than one method

We have studied some methods for separation of substances from their mixtures. Often one method is not sufficient to separate the different

substances present in the mixture. In such situations, we need to use more than one of these methods.

Activity-7: Separate different materials from the mixture

Take a mixture of sand, saw dust and salt in a beaker half-filled with water. Stir the mixture well. Allow to undisturb for 10 minutes. What do you observe?

- Which substance floats on the water?
- How can you collect it?
- Which substance settles at the bottom of the beaker?
- How can you collect it back?
- Which substance is dissolved in the water?
- How can you get it back?

Think about suitable methods to separate the substances that are floating (or) settled at the bottom of the beaker (or) dissolved in water and write them in your notebook.

Separation of substances is a very important scientific activity and is also important in our daily life.

We are using different types of separation techniques for various purposes to get desirable quantities of material.

Distilled water will hamper metabolic processes - if distilled water is consumed for longer period.

Solid form of Carbon dioxide is called Dry Ice

Keywords

Mixture, separation, handpicking, winnowing, sedimentation, decantation, sieving, filtration, crystallization, distillation, sublimation, chromatography

What we have learnt

- Substances can be separated from a mixture.
- Hand picking is used to separate substances when their sizes are sufficiently large.
- If mixtures have light and heavy substances, winnowing can be used for separation.
- An insoluble substance in a liquid can be separated by sedimentation and decantation.
- Sieving can be used for separating larger and smaller substances in a mixture.
- Crystallization is used for separation of dissolved substances from a liquid.
- Distillation is used to remove impurities from water.
- More than one method of separation can be used to separate the components of some mixtures.

Improve your learning

1. Is it possible to separate sugar mixed with wheat flour? If yes, how will you do it? If powdered sugar is mixed with wheat flour, how do you separate them?
2. Why is hand picking necessary after winnowing?
3. Srikar accidentally mixed mustard seeds with rice and salt. How can he separate them?
4. Which separation process is used when one component is in a mixture :
 - a. Heavier than the other?
 - b. Bigger than the other?
 - c. Different shape and color from the other?
 - d. One is soluble in water and the other is not?
 - e. One floats and the other sinks in water?
5. Visit a nearby dairy and report about the processes used to separate cream from milk.
6. Divya suggested some methods to separate mixtures given below. Are they correct? Find whether they are possible or not. Give reasons.

- a. Pure water can be obtained from sea water by the process of filtration.
- b. Cheese is removed from curdled milk by the process of decantation.
- c. Separation of sugar from tea can be done by filtration.
7. Collect information from your parents regarding various methods used by us to clean food
9. Match the following; and write sentences in your note book.
- | | |
|----------------------------------------------------------------------------|--------------------|
| A) A substance obtained by mixing two or more pure substances. | 1. Sublimation () |
| B) A clear liquid obtained after filtration | 2. Decantation () |
| C) A solid changing directly into vapour | 3. Mixture () |
| D) A method for removing the husk from grain | 4. Winnowing () |
| E) Removing insoluble impurities from muddy water by allowing it to settle | 5. Filtrate () |
10. Draw a picture of article used for separation of mixture in your house.
11. Kiran observed his father separating husk and grains by winnowing method in the field and appreciated how wind flow helped in separation. On evaporation salt is formed from sea water. Isn't it? How would you appreciate this process?

In the Middle Ages, salt was so expensive it was sometimes referred to as "white gold".

Science

VI Class

8

Fibre to Fabric

Neelima lives in a small village. Her father is a salesman at a cloth shop. One Sunday she went there along with him. She was amazed to see so many varieties of cloth (fabrics). Her father and other salesmen were showing different types of fabric to the customers. They were telling customers about their smoothness, thickness, colour and shrinking property. They were also telling them how to take care of the fabrics, whether they were washable or needed to be dry-cleaned. She also noticed that some materials cost less than the others. On the way back home she asked her father many questions. Why was there a difference in the price? How are these fabrics made? What materials are these fabrics made of?



Fig. 1

Is the process of making fabrics the same for all types? Let us try to find the answers to Neelima's questions.

Types of Fabrics

List the types of clothes we wear in the following months:

| Seasons | Cloths we wear |
|---------|----------------|
| Summer | |
| Winter | |
| Rainy | |

We can say that we use fabric as a shield to protect ourselves from different



Fig. 2

Corn fibre is a new innovation in the textile industry.

FIBRE TO FABRIC

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weather conditions. Along with protection, clothes can also be a symbol of beauty and status. Choice of fabric may vary from person to person. Somebody may like to wear clothes made up of light, thin, shiny fabrics. Another person may like to wear clothes that are bright coloured and made of coarse fabrics. Fabrics for casual and formal wear may be different. Personal choice, personality of the owner and the cost of fabric are all-important factors in the selection of the perfect fabric.

Our purpose and the properties of a fabric together determine which type of fabric can be used for each purpose. Coarse fabrics can be used for mopping and making gunny bags but not for making clothes. Some other properties will have to be considered for choosing curtain fabrics.

Do you know?

The material used for making school bags is also a kind of fabric. Fabrics are not only used for making clothes; they are also used in making banners, flags, shoes, curtains, in book binding etc. Calico is a type of fabric used in book binding.

Activity-1: Things made up of fabric

List things in your house made up of any type of fabric. Classify them into

Silk is commonly obtained from silkworms. However, in recent times, scientists have come up with an innovation wherein silk is produced from spiders.

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cotton, silk, wool, polyester, terylyn, etc. Try to enrich the list as much as you can. For identifying the fabrics, you can take the help of your elders and teachers.

Table 1

| Type of fabric | Things |
|----------------|------------------|
| Cotton | |
| Silk | Kurta, Sari, ... |
| Wool | |
| Polyester | |
| Linen | Trousers, ... |

- Which kind of fabric is being used more in your house?
- How did you identify the type of fabric?

Cotton fabrics are somewhat thicker than polyester fabrics. Coarse cotton clothes are heavier. After washing, cotton clothes get wrinkled. Silk fabric is smooth to touch whereas woollens are somewhat heavier than silk fabrics.

- Try to find out the properties of each type of fabric (cotton, wool, polyester, etc.).
- Which properties were you able to generalize for a particular type?

What are fabrics made up of?

When you look at any fabric, it appears to be a single, continuous piece. Now look at it closely; what do you notice?

Activity-2: Threads in the fabric

Take a piece of fabric. With the help of a magnifying lens, observe how the fabric is. Pull out threads one by one from the fabric. Observe these threads. What did you observe?

Take one thread. Scratch its end. Observe it through a magnifying lens. Were you able to see the fine structure of thread?

Take a needle and try to insert this thread into the eye of the needle. Can you? Isn't it difficult? Have you ever seen what people do to overcome this problem? Generally when we are not able to put thread into the eye of the needle, either we twist the end of the thread or we wet the end using saliva.



Fig. 3

There are thread-like structures in the fabric. These threads are also called yarn. So fabric is made up of yarn. The end of the yarn is separated into thin strands. This thin strand of thread is made up of still thinner strands. These thinner strands are called fibers. Every fabric is made up of yarn. If it is

cotton fabric, it is made up of cotton yarn which is derived from cotton fibre.

Fibre → Yarn → Fabric

Types of fibres

We know that there are different kinds of fibers like cotton, wool, silk, polyester etc. The fibers of some fabrics such as cotton, jute are obtained from plants. Silk and wool are obtained from animals. The fibres that are derived from plants and animals are natural fibres. Nowadays, clothes are also made up of chemically developed yarn like polyester, teryline, nylon, acrylic etc. These are all called artificial fibres.

Do you know?

Human beings in ancient times used leaves and skins of animals as clothes. Clothes were also made from metal. Warriors used to wear metal jackets during wars. You can see clothes like these in historical museums or in television shows.

Activity-3: Characteristics of fabrics

Collect some natural and artificial fabrics and observe the following characteristics. Record your observations in table 2.

Coir fibre is thick and strong and is hence ideal for use in rugs, sacks and brushes.

FIBRE TO FABRIC

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Table 2

| S. No. | Character | Natural fabric | Artificial fabric |
|--------|-----------------------------|----------------|-------------------|
| 1. | Water absorbing nature | | |
| 2. | Time taken to dry | | |
| 3. | Smell while burning | | |
| 4. | Result after burning | | |
| 5. | Stretching capacity of yarn | | |
| 6. | Smoothness | | |

- Which types of fabrics are smooth in nature?
- Which type of fabrics dry in a short time?
- Do you find any relation between smoothness and time to dry?
- Which fabrics give ash when they are burnt?

Silk fabrics are slippery and shiny in nature, whereas cotton fabrics may be coarse as well as smooth. When we burn fabric made up of artificial fibres it gives a pungent smell.

Natural Fibres

Cotton, jute, wool and silk are some common examples of natural fibres. In this section, we will discuss cotton and jute in detail. Cotton is obtained from cotton balls or cotton fruits. Usually cotton plants are cultivated in black soil. In our state, cotton crop is widely grown in districts like Prakasam and Adilabad,

Nalgonda and most of the districts of Telangana region.

- Look at the Andhra Pradesh map and list out the places where cotton is grown.

Activity-4: Making cotton yarn.

Collect cotton balls from nearby houses or cotton growing fields (Fig. 4). Remove seeds from the cotton balls and separate cotton. Take a small piece of cotton; observe it using a magnifying lens or under a microscope. What do you observe?

You will see small hairy structures. These are the fibres of cotton. After maturing, cotton balls burst and open. Then we can see white



Fig. 4

The hair of the yak is very useful in the production of warm clothes, mats and sacks.

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coloured strands of cotton fibre. Cotton is usually picked by hands. When cotton wool is separated from seeds, it is called ginning.

Making yarn from cotton fibre:

Cotton fibre is collected after removing the seeds from the cotton ball. This cotton fibre is cleaned, washed and combed. This fine cotton fibre is used to make cotton yarn. Yarns are dyed and coated with chemicals. Then they become strong enough to make fabrics.

Activity-5: Spinning yarn

Take cotton ball and remove seeds from it. Take some of it in one hand and gently start pulling out cotton by using thumb and forefinger (Fig. 5(a)). Continuous twisting of the fiber will make yarn. Is it strong or not?



Fig. 5 (a)

The yarn that we make from cotton wool is not strong enough to be used

for weaving. To get strong yarn from fibre, Takli (Fig. 5 (b)) an instrument for spinning has been used since olden days. Charka (Fig. 6) is also used to make yarn. The process of making yarn from fibers is called spinning.

Fig. 5 (b)

Do you know?

In Nalgonda district, cotton is widely grown. To pick up maturing cotton balls from cotton plants, children work in field as child labour. Some voluntary organizations along with government are working to eradicate child labour. Think, why are children forced into labour? Give your own solutions to this problem.



Fig. 6

Charles Macintosh was a Scottish chemist who invented (1823) a method for making waterproof garments.

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Do you know?

During the freedom struggle, Mahatma Gandhi encouraged people to wear clothes made of homespun (khadi) yarn. People burnt imported clothes during Swadeshi movement.

Jute yarn

Have you seen gunny bags? Where do you see them? Paddy, chili and other commercial crops are packed in gunny bags. All bags of these types are made up of coarse jute fabric.



These bags are suitable for carrying heavy material. Do you know how jute yarn is made? Is this process same as that for cotton or is there any difference?

Like cotton, jute yarn is also useful in making fabric. It is also called golden fibre. Jute fabric is not the same as cotton fabric. It is harder, stronger and more rough.

Making of Jute Yarn

Jute fibre is obtained from stem of jute plant. The stem of the harvested plant is cut and immersed in water for some days. When the stem is soaked in water it becomes rotten and easy to peel. Then the fibres are separated from the stem to make jute yarn.

Activity-6: How is jute yarn?

Collect gunny bags. Pull out the threads from the bag and observe under magnifying lens. You will see strands of yarn. Observe how the fibre looks like? compare these fibers with cotton fibers.

Do you know?

We all use polythene bags for different purposes. Polythene is very difficult to decompose. To protect our environment, we should use cloth bags instead of polythene bags.

In the same way fibre is made from Red sorrel (Gongura) and Bamboo. Hemp and flax are also plant fibres which are used in making clothes but in smaller quantities as compared to cotton.

Yarn to fabric

The yarn that is prepared from fibre is used to make fabric.



Fig. 7

Waldo L. Semon invented a way to make polyvinyl chloride (PVC) useful. He created vinyl.

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Strands of yarn are arranged in vertical and horizontal rows in a loom to weave fabric.



Fig. 8

Spinning of yarn on large scale is now done by using machines. Two sets of yarn arranged together to make fabric is called weaving. Weaving is done on looms. The looms that are worked by man power are called handlooms (Fig. 7). Power looms are run by machines (Fig. 8)

Activity-7: Mat making

Take coconut leaves or two different colour paper strips. Cut and remove middle vein of the leaf to get two halves. Now put these strips parallel to each other (Fig. 9). Take one more strip and insert horizontally and alternately between the vertical strips. Finally you will get a sheet like structure. This is the

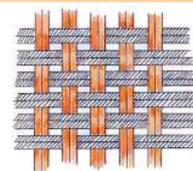


Fig. 9

way a mat is prepared. In the same manner, weave a paper sheet by using paper strips.

The handloom industry is well developed in our state. Places like Gadwal, Venkatagiri, Siricilla, Narayanpet, Dharmavaram, Pochampalli, Mangalagiri and Kothakota are famous for handloom industry. Warangal is famous for carpet industry.

Keywords

Fabrics, fibres, yarn, natural fibres, artificial fibres, ginning, spinning, weaving, looms

What we have learnt

- Cotton, wool, silk, jute are all derived from plants and animals. They are called natural fibres.
- Fibres made of chemicals are called artificial or synthetic fibres.
- Tiny strands like structures are called fibres. These fibres are

In 1970, Toray Industries scientist Dr. Miyoshi Okamoto invented the world's first microfiber.

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