1 THE CHAIN OF LIFE

Figure 1.1

Observe the picture.

Which bird is in the picture?

What is its main food?

Where is this bird usually seen?

What could be the reason for that?

The kingfisher lives in burrows on river banks or near ponds. They mostly choose places near water sources where they can fish.

There are many creatures around us who eat various kinds of food.

What are the different types of food that they eat?

What is the main food of goat?

-
-

Figure 1.2

Which other creatures feed on parts of plant?

Find and write.

- Deer
- Rabbit
-
-

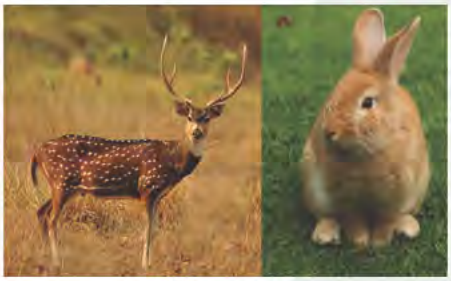


Figure 1.3

Food and habitat

Observe the picture.

Illustration 1.1

Write down the creatures seen in the picture.

Which of these creatures feed on plants?

- Small fishes
-
-

Which creatures feed on small fishes?

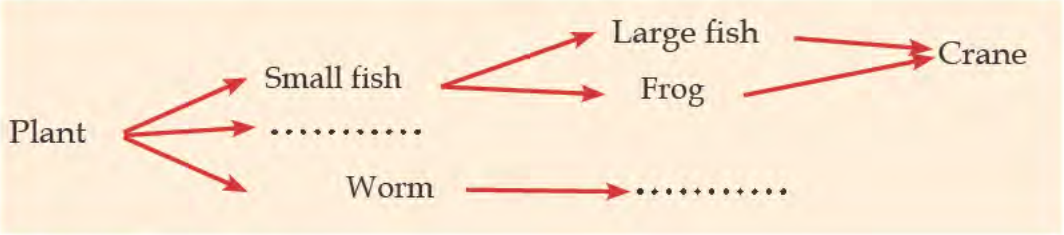
-
-

Every creature in the picture feeds on some other organism.

Small fishes feed on plants.

Large fishes feed on small fishes.

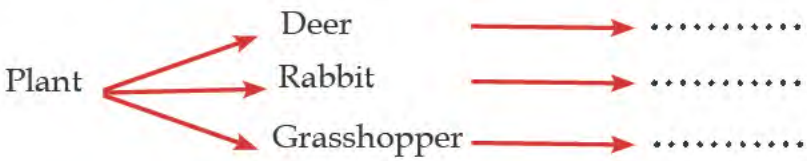
Cranes feed on fishes. Complete the illustration by adding other creatures in the field.



Linked together

Deer, rabbit and grasshopper are plant-eating creatures.

Complete the food relationship by adding other creatures that feed on them.



Present the completed food relationship in the class. Expand the food relationship by adding more organisms and illustrate in the science diary.

Living beings depend on one another for food. This interrelationship among them is the food web.

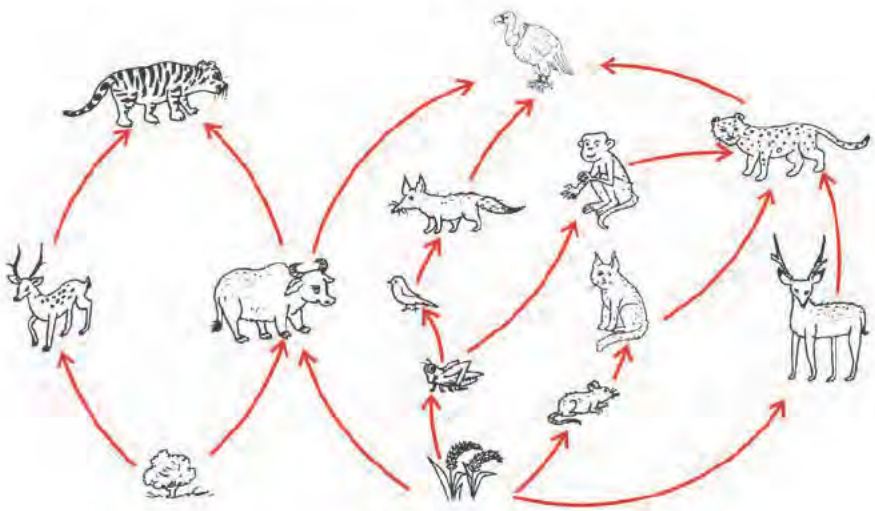


Illustration 1.2

Coexistence at the sea

Have you seen the various food relationships on land?
In this way, the sea also has various food relationships.

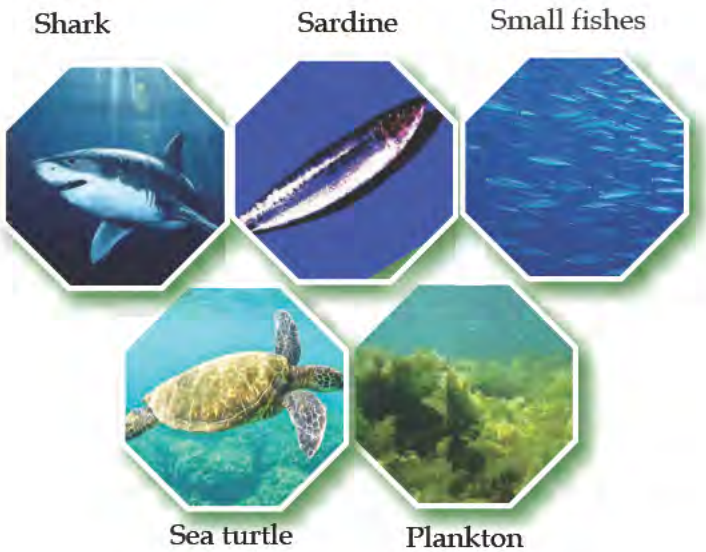


Figure 1.4

Some sea creatures are shown in the picture. Look at the information in the table below and draw a food web that includes these organisms.

Organism	Food
Shark	Squid, fishes, sea turtle
Sardine	Small fishes, plankton
Sea turtle	Plant parts, fishes
Small fishes	Plankton

Table 1.1

Plankton are small plants that flow freely in water bodies. They are the producers in the habitat system of the ocean.

So many food relationships

Observe a tree in your surroundings, continuously for a few days. Draw a food web in your science diary that includes the organisms you observed.

For survival

Observe the picture.

Illustration 1.3

Did you see the fish in the pool?

What components does the fish need to survive?

- Sunlight
- Aquatic plants
-

Don't you think other organisms in the pond also need these components to survive? Categorise and list the components of the pond.

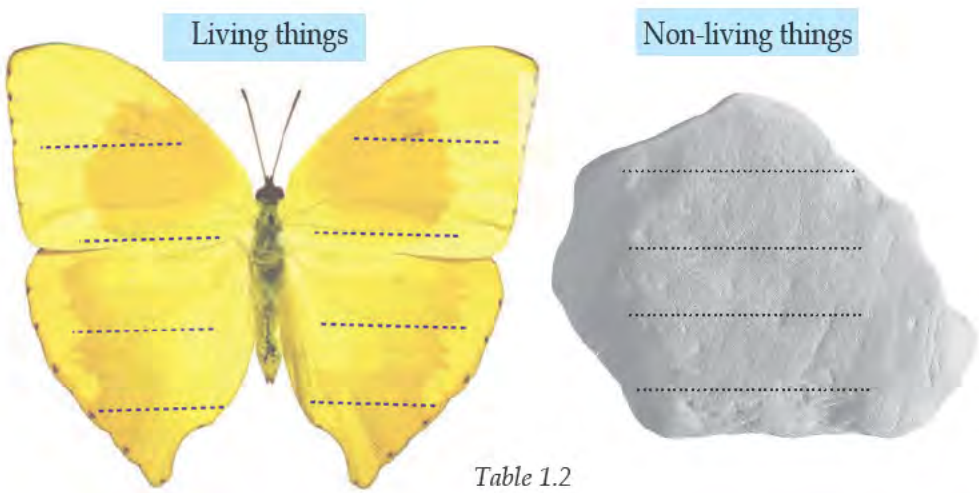


Table 1.2

The habitat

A paddy field is an environment that contains all the components necessary for the existence of various organisms. Apart from fish, it is also a habitat to many other creatures.

Are there any other habitats like this around us?

Observe the biodiversity garden in your school.

Figure 1.5

The biodiversity garden is a habitat to many creatures. Which are they?

What are the favourable conditions for the presence of the various organisms found in the biodiversity garden?

Observe and prepare notes.

Present a roleplay in your class involving living and non-living things in a biodiversity garden.

Living things can exist only by depending on non-living things.

Do you agree with this statement? Why?

What are the items to be included in the observation note?

1. Aim of observation
2. Materials *(if required)*
3. Conditions of observation *(where, how, when)*
4. Findings
5. Conclusion

Every living thing has a suitable habitat. Discuss with your friends. Can you suggest a suitable definition for habitat?

Observe your surroundings and find different types of habitats.

Observe the figure 1.6. Which are the habitats shown here?

Figure 1.6

- Grasslands
- Desert
-
-

Food card

The food cards of two creatures are shown in the picture.

Creature : Crow
Food : Small creatures, fruits, grains, food waste, remains of dead organisms.

Creature : Goat
Food : Grass, leaves, grains

In this way, prepare the food card of two other creatures.

What happens if the numbers go up or down?

Examine the food web.

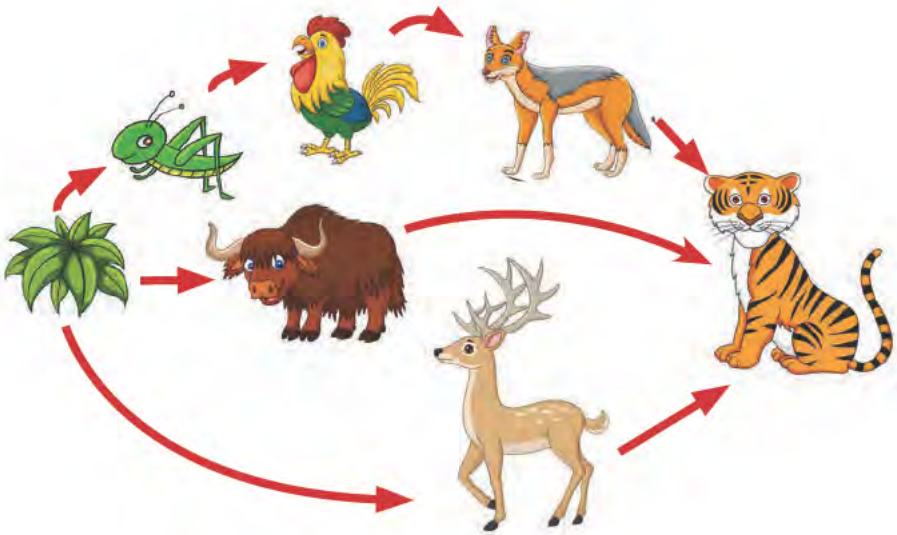


Illustration 1.4

What will happen if tigers disappear from this habitat?

Which organisms will increase in number?

What will happen if the deer population increases?

Why tiger conservation?

The tiger is one among the highest link in the food web. Organisms in each link play a key role in maintaining healthy numbers of herbivores and carnivores in an ecosystem. If some organisms in the lower links of the food web disappear, they may be replaced by other organisms that perform the same function. If there are no other creatures like the tiger, there are no one to perform its functions. Therefore, conservation of high-ranking organisms like the tiger is a priority. By conserving tigers, a larger habitat is being conserved.

The invaders

Figure 1.7

The African catfish is a fish found in the African continent. They grow and multiply very quickly. They are found as an invasive fish in some water bodies of Keralam. The African catfish feeds on native fish in the water bodies. The organisms that feed on the African catfish are not found in our water bodies. What will happen to the habitat if an African catfish reaches into a local pond?

Find out if your locality has any of these invasive organisms. Identify and present what problems they cause to other plants and creatures.

What all information must be collected?

What are the animals?
What are the plants?

Where should the information be collected?

From adults.
From media.
From books and references.
Through observation.

What should the report contain?

Introduction
Aim
Method of study
Data collection
Analysis
Conclusion
Suggestions
Additional information

Food relationships

Look at the food web.

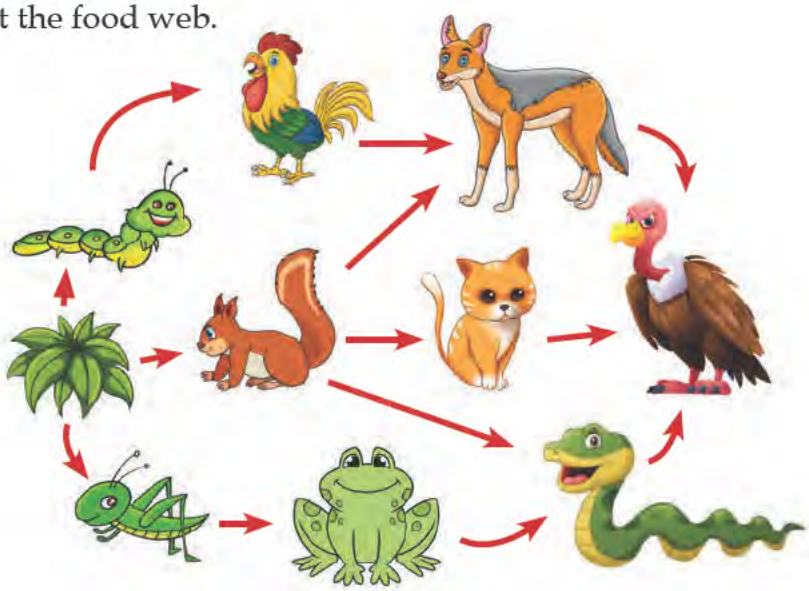


Illustration 1.5

There are various food relationships in the above picture.
The food relationships in a single sequence is given below.

Illustration 1.6

Find out and write more such sequences.

> ***A single sequence of food relationships from the food web is the food chain.***

Compare food chains you have written and list them in your science diary.

First link	Last link
Grass	Vulture

Table 1.3

From which organisms do all the food chains begin?

Don't they also need food for their existence?

Where do they get their food?

Food production in plants

Observe the illustration.

Which are the main components that plants need to make their food?

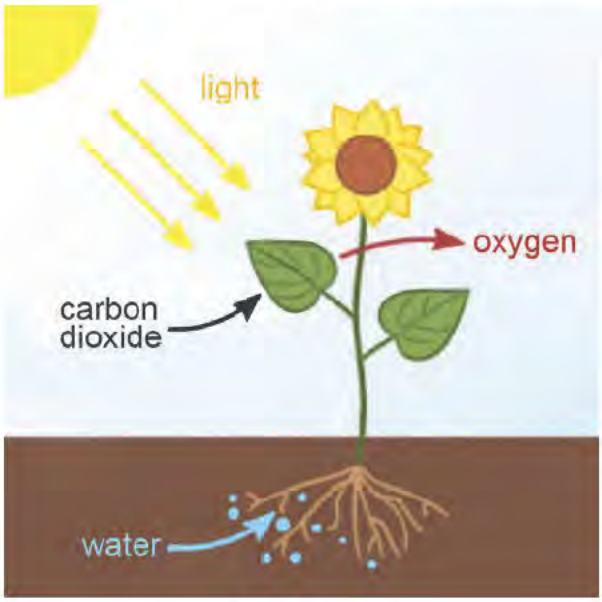


Illustration 1.7

- Carbon dioxide
-
-

Plants make food using carbon dioxide and water. For this, they use the energy from sunlight. So this activity is called photosynthesis. Chlorophyll is a pigment in the leaves that helps plants to produce food. Oxygen is also produced as a result of this activity.

Source of energy

You have seen that sunlight is necessary for food production in plants.

Through which part do plants mainly receive sunlight?

Observe this picture.

Figure 1.8

The leaves of plants are arranged in such a way that they receive maximum sunlight.

Look at the arrangement of the leaves in the following pictures.

Do you find any special features?

Hibiscus

Tulsi

Blackboard tree (Ezhilam paala)

Figure 1.9

Observe the plants in your surroundings and group them according to the similarity in the arrangements of leaves.

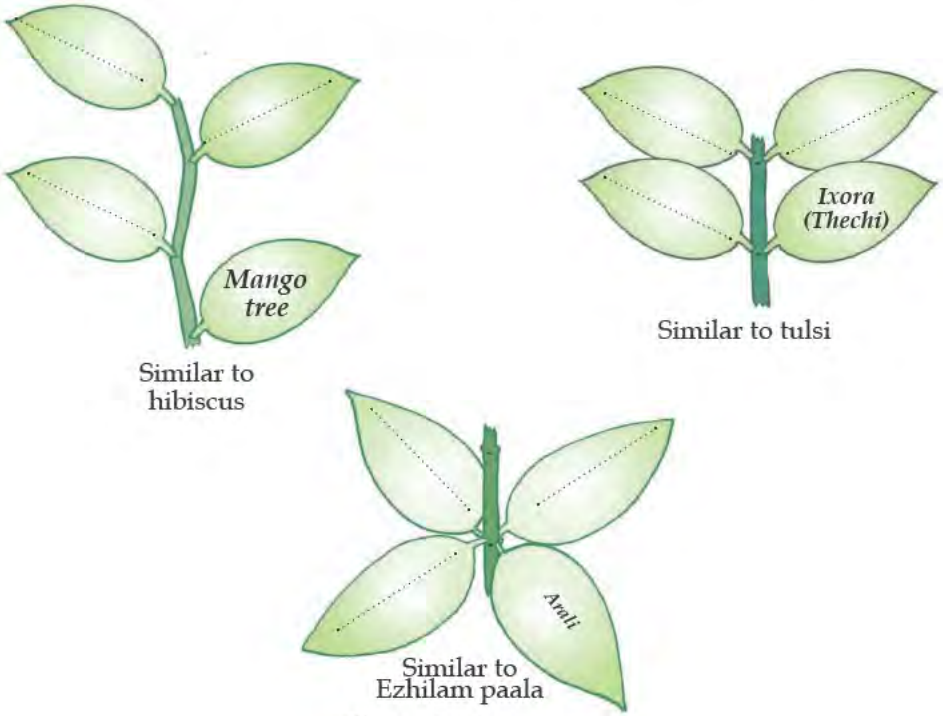


Illustration 1.8

Draw the arrangement of leaves of various plants and prepare an album.

Behind the leafy green

The leaves are green in general. But you must also have noticed multi-coloured leaves. Collect different coloured leaves from your surroundings. Rub the collected leaves on a blotting paper.

Write down your observation in the table.

Name of plant	Colour of the leaf	Colour seen on blotting paper
• Spinach	• Red	•
•	•	•
•	•	•
•	•	•

Table 1.4

Write your findings from the table in the science diary.

Chlorophyll is the green pigment in leaves.

Diversity in colour

Observe the biodiversity garden in your school.

Can't you see flowers and leaves in different colours? You have seen that the reason for the green colour is chlorophyll, haven't you? What are the pigments that cause other colours?

Look at the table and find out.

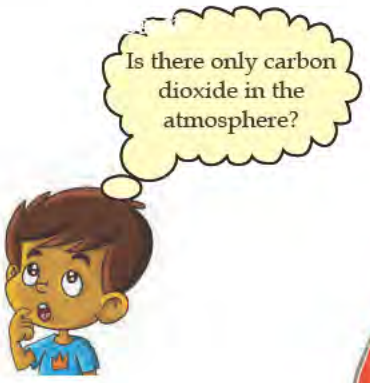
Colour	Pigment
Red	Anthocyanin
Orange	Carotene
Yellow	Xanthophyll

Table 1.5

Gaseous exchange in plants

Did you understand that carbon dioxide is the gas used for photosynthesis?

Which of these gases are used by living organisms for respiration?



Look at the illustration showing the amount of gases in the atmosphere.

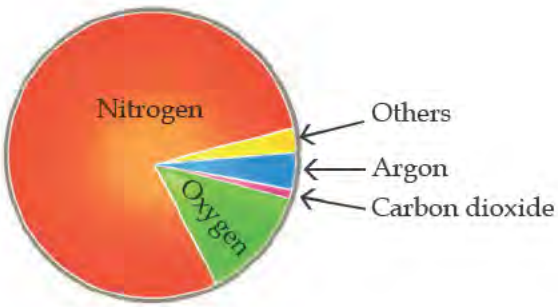


Illustration 1.9

Living things breathe to get energy.

Don't you think that plants also need energy?

Shouldn't respiration take place in plants to obtain energy?

Yes, respiration takes place in plants too. All living beings use oxygen for respiration. As a result, carbon dioxide is produced. Animals release carbon dioxide. Carbon dioxide produced as a result of respiration by plants is used for photosynthesis during day time. Carbon dioxide from the atmosphere is also used by plants for photosynthesis.

Air enters plants through the leaves.

Let us examine whether there is any special part in the leaves for this.

Observe the leaf layer in a microscope and draw it in the science diary.

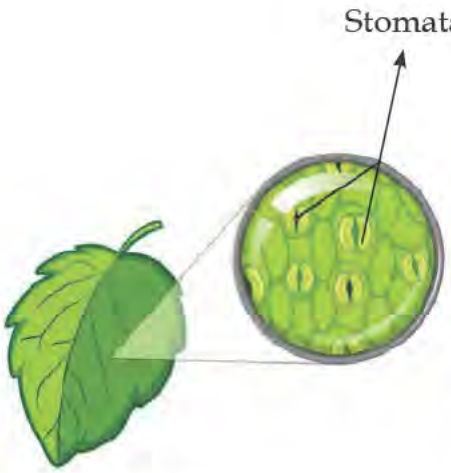


Illustration 1.10

A microscope is an instrument used to magnify things that cannot be seen with the naked eyes.

These microscopic pores in the leaves are known as stomata.

It is through these pores atmospheric air enters the plant.

Oxygen produced as a result of photosynthesis is also released through these pores.

Observe the illustration.

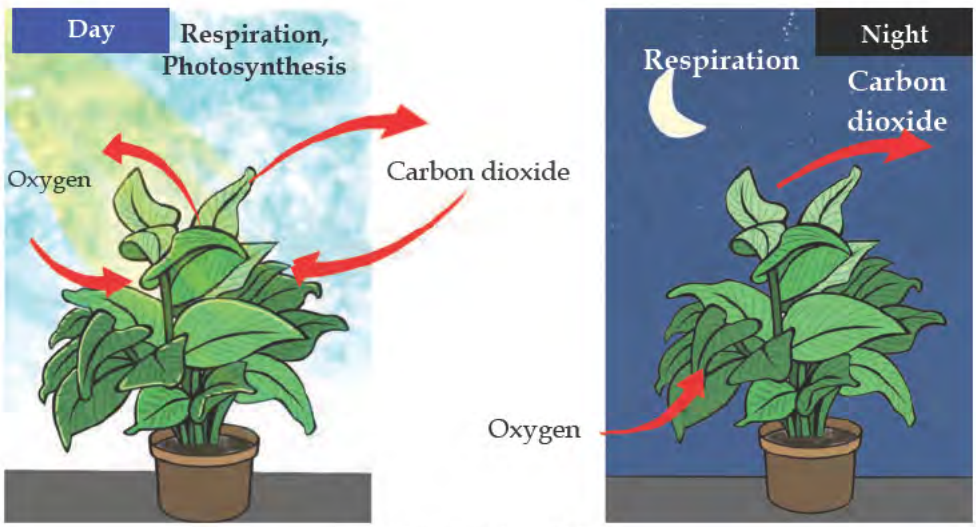


Illustration 1.11

Do plants release only oxygen? Discuss.

Host and guests

Do all the plants make food?

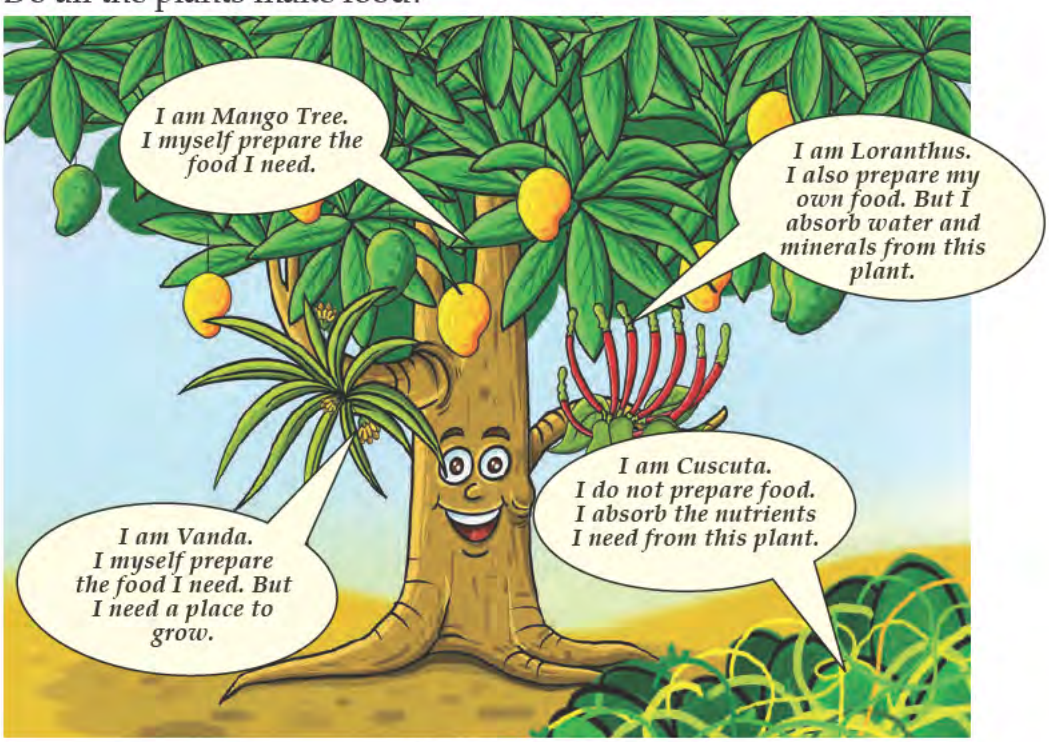


Illustration 1.12

You have observed the conversation among the Mango Tree, Loranthus, Cuscuta, and Vanda, haven't you? Which of these plants prepare their own food?

These plants get the sunlight and carbon dioxide needed for photosynthesis in the same way.

But, how do they get water?

Where does the mango tree get its water from?

How about vanda and loranthus?

Observe the picture of vanda.

Figure 1.10 ***Vanda***

Don't you see two types of roots? What are the functions of these roots?

Where do the thick white roots grow to?

The small roots help the vanda to grow by clinging onto the tree. The thick roots absorb moisture from the atmosphere. They depend on host plants only for habitat. Such plants are called epiphytes. Orchids are examples of epiphytes.

Observe the epiphytes and understand the peculiarities of the roots.

Can the growth of epiphytes harm the host plant?

Observe the picture of the roots of Loranthus

Figure 1.11 ***Loranthus***

Where do their roots grow to?

What is the benefit for Loranthus with their special roots?

> ***Loranthus makes its own food by absorbing water and minerals from the host plant. Therefore, plants like Loranthus are called semi-parasites.***

Observe the Cuscuta spread on the plant.

What colour is it? Do you see leaves?

Can Cuscuta prepare food? Where do its roots grow to?

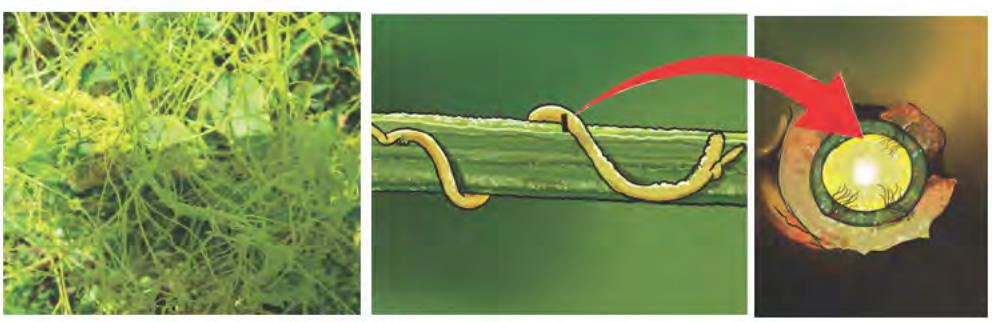


Figure 1.12 ***Cuscuta (Moodillathali)***

> ***Cuscuta plants have roots that can absorb nutrients from the host plant. They are called total parasites.***

Observe the picture.

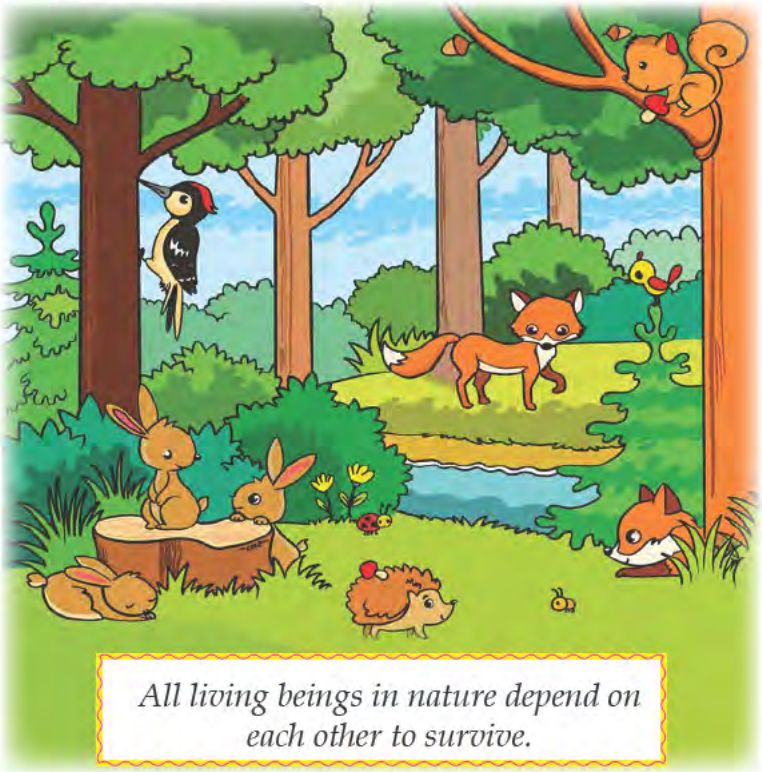


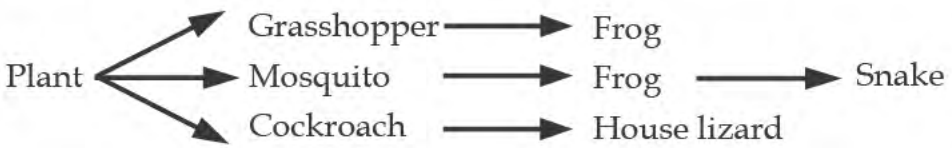
Figure 1.13

Look around and find more examples for the interdependence of living beings. Write down your findings in your science diary.

Let us assess

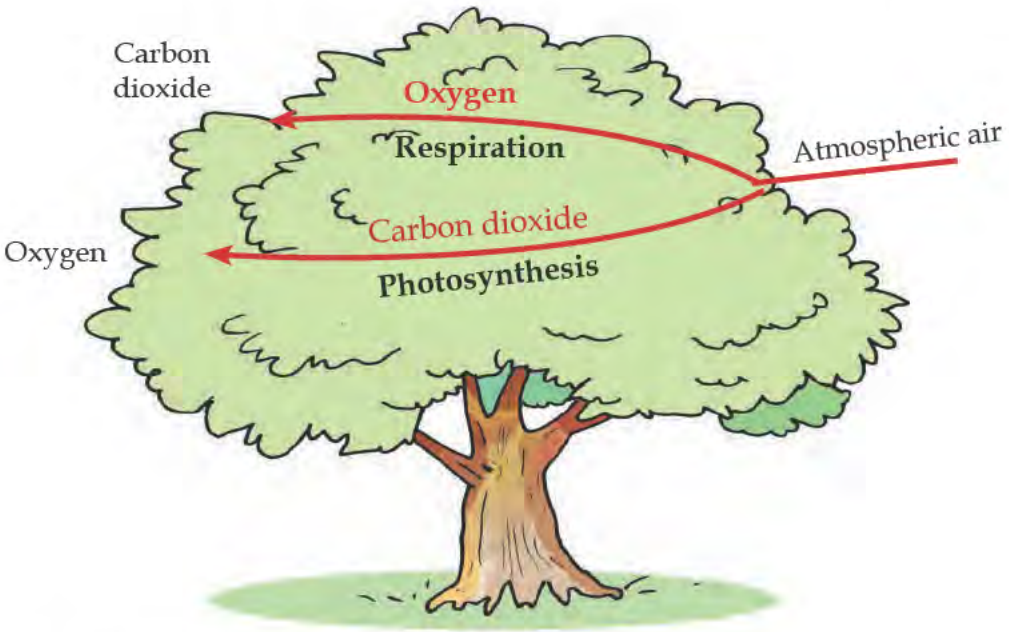
1. 'The plants with red coloured leaves can not prepare food by themselves'. Do you agree? Why?

2



What will happen to this food web if the number of frogs decrease?

3. Observe the illustration and complete the stages of gaseous exchange in plants.



- Atmospheric air enters the plant
- Photosynthesis takes place using the carbon dioxide in the atmospheric air.
-
-

Extended activities

1. Wrap the leaf of a plant with a transparent polythene cover. Observe it the next day. What is seen in the polythene cover? What would be the reason?

2. Observe a pond in your locality and write the maximum food chains. Find out if there is any human activity that destroys the habitat of a pool.