

# UNIT 4

## INTERACTION AMONG LIVING THINGS



Observe this picture of a wetland habitat. How many living things can you identify in the picture? All the living things in this habitat live together and interact with each other to survive. How do they interact?

# Interaction Among Living Things

Interaction among living things is a **relationship among living things that depend on each other** to obtain basic needs to continue living.

## Interaction Among Animals

There are three types of interactions among animals. They are prey-predator, competition, and symbiosis.

### Prey-predator

cheetah

The cheetah is a **predator** that hunts the gazelle.



gazelle

The gazelle is a **prey** that is eaten by the cheetah.

A **predator** is an animal that hunts other animals for food. The animal being hunted or eaten by the predator is the **prey**.

### SCIENCE INFO

The prey-predator interaction also occurs among animals and plants. For example, the interaction between the fly and the Venus flytrap plant. Venus flytrap is the predator to small insects such as flies.

fly



Venus flytrap



Observe the interactions below. State the **prey** and the **predator** in each interaction.



fish



bird



eagle



rabbit



turtle

jellyfish



spider

grasshopper

## Competition Among Animals

When there are limited resources of basic needs, animals will **compete** with each other in order to survive.

Competition among animals of the same species is known as **intraspecies competition**. Competition among animals of different species is known as **interspecies competition**.

### Intraspecies Animals

### Factors of Competition



Hyenas compete for food.

Food



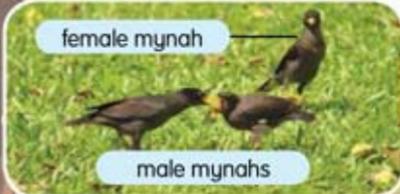
Zebras compete for water.

Water



Hippopotamuses compete to defend their territory.

Shelter or territory



Male mynahs compete for female mynahs to mate.

Mate

**Intraspecies** competition occurs when the sources of food, water, shelter or territory, and mate are limited.



What are the factors of competition among animals?

### Interspecies Animals

Vultures compete with lions for food.



Zebras compete with gnus for water.



An oystercatcher chases a seagull out of its territory.



What is the difference between intraspecies and interspecies competitions?



**Interspecies** competition occurs when the sources of food, water, shelter or territory are limited.

Explain the factors of competition among intraspecies and interspecies animals. Give examples.

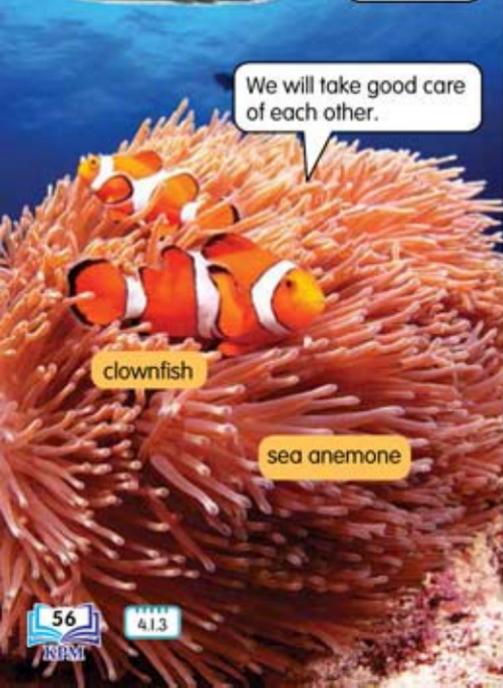
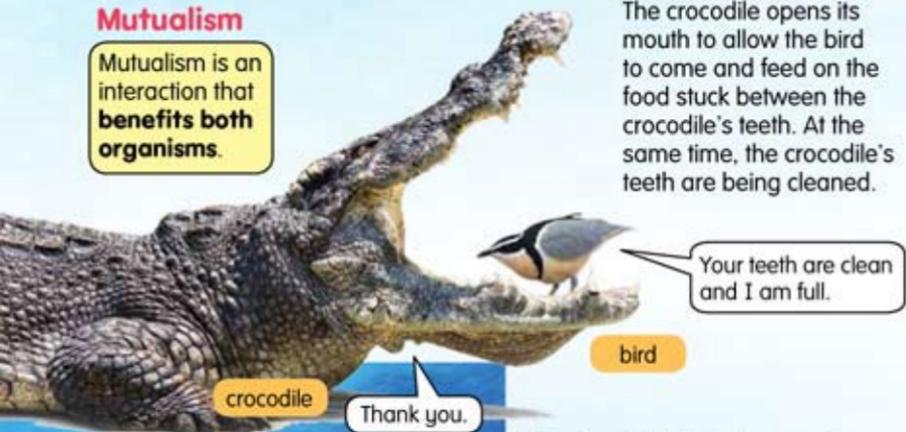


## Symbiosis Among Animals

Symbiosis is a close relationship between two animal species. There are three types of symbiosis. They are known as **mutualism**, **parasitism**, and **commensalism**.

### Mutualism

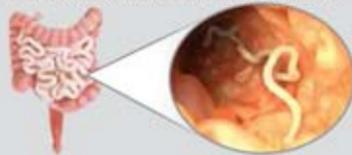
Mutualism is an interaction that **benefits both organisms**.



The clownfish hides between the tentacles of the sea anemone. The anemone's sting protects the clownfish from being eaten by its predator. At the same time, the clownfish chases away the anemone's predators, such as the butterflyfish.

### SCIENCE INFO

Did you know that parasitism also takes place between animals and humans?



Tapeworm is a parasite that absorbs food from the intestines such as the human intestine. The host will fall ill or lose weight.

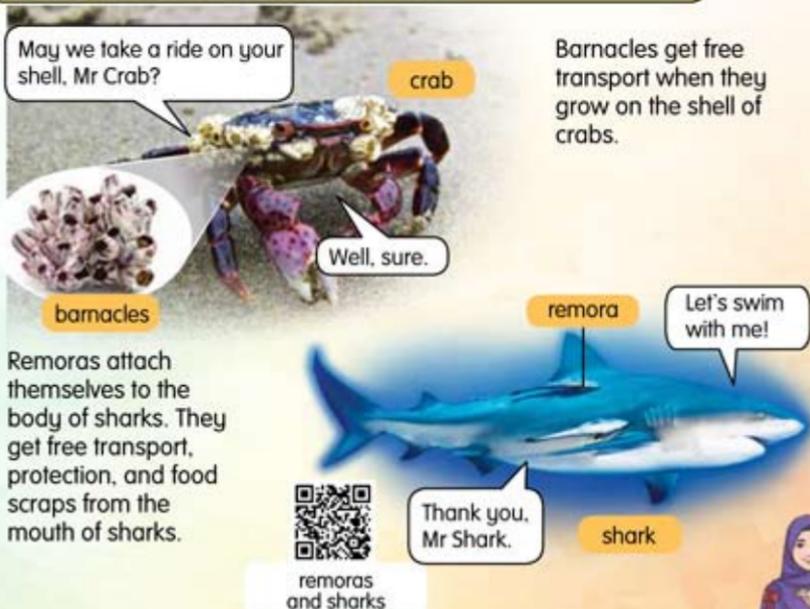
## Parasitism

Parasitism is an interaction that **benefits one organism** and **harms the other**. In this interaction, the organism that gains the benefits is called the parasite, while the one that is harmed is called the host.



## Commensalism

Commensalism is an interaction that **benefits one organism** but **does not harm nor benefit the other**.



Explain the types of symbiosis for different animals. Give examples.



**Apparatus and materials:** manila card, coloured card, stapler, scissors, box, glue, rubber bands, A4 paper, hole punch

**Steps:**

1. Create a hat using a manila card and a stapler. Make a hole on both sides of its base and connect the holes using rubber bands.
2. Cut out an animal shape from a coloured card and paste it on the hat.
3. Make a few more hats with different animal cut-outs.
4. Cut an A4 paper into smaller pieces and write a type of interaction. For example, "prey-predator". Roll them up and place them in a box.
5. The group leader will randomly pull a rolled piece of paper from the box and choose a friend to act out the type of interaction among animals. The group members will continue this game by pulling out another rolled piece of paper and so on.



Be careful when using scissors.

**Questions:**

1. State the definition of interaction among living things.
2. Describe the types of interactions among living things that you have learned.
3. What are the factors of competition among animals?
4. State the types of symbiosis among animals.

## Interaction Among Plants

Plants in a particular habitat also interact with each other to continue living. There are two types of interactions among plants. They are known as **competition** and **symbiosis**.

### Competition Among Plants



What causes plants to compete?

Plants compete when their basic needs are limited.



#### LET'S TEST

### Plants Compete

#### Activity 1

**Aim:** To investigate space as a factor that causes competition among plants

**Apparatus and materials:** small-sized flowerpot, big-sized flowerpot, garden soil, 30 green bean seeds, water

#### Steps:

1. Plant 15 green bean seeds in a small-sized flowerpot and plant another 15 green bean seeds in a big-sized flowerpot.
2. Water the seeds in both pots with the same amount of water every day.
3. Compare the growth of the green bean seedlings in both pots after three weeks.

#### Questions:

1. What can you observe about the growth of the green bean seedlings in the small-sized and big-sized flowerpots? Why such changes occur?
2. State a factor that causes the difference in the growth of the green bean seedlings in both pots.



Green bean seeds can be substituted with chilli seeds or okra seeds.

4.12  
4.23

**Activity 2** **Aim:** To investigate water as a factor that causes competition among plants

**Apparatus and materials:** two small-sized flowerpots, garden soil, 13 green bean seeds, water

**Steps:**

1. Label two flowerpots as A and B.
2. Plant 10 green bean seeds in pot A and three green bean seeds in pot B.
3. Water the seeds in pot A and B with the same amount of water every day.
4. Carefully remove the green bean seedlings in pots A and B after three weeks. Observe the root growth of the seedlings in both flowerpots.

**Questions:**

1. Compare the root growth of the green bean seedlings in pot A and B. What can you observe?
2. Why do such changes occur?
3. What is the factor that causes the green bean seedlings to compete?

**Activity 3** **Aim:** To investigate sunlight as a factor that causes competition among plants

**Apparatus and materials:** two small-sized flowerpots, two boxes, garden soil, 18 green bean seeds, water

**Steps:**

1. Label two flowerpots as A and B. Plant 15 green bean seeds in pot A and three green bean seeds in pot B.
2. Prepare two empty boxes.
3. Make a small hole each at the top part of both boxes.
4. Cover pot A and B with the boxes. Ensure that the small holes are positioned upwards.
5. Water the seedlings every day using water tubes that are inserted through the holes on the top part of both boxes.
6. Remove the boxes after three weeks. Observe the growth of the green bean seedlings.

**Questions:**

1. Compare the root growth of the green bean seedlings in pot A and B. State your inference.
2. What is the factor that causes the green bean seedlings to compete?

**Activity 4** **Aim:** To investigate nutrients as a factor that causes competition among plants

**Apparatus and materials:** two flowerpots, garden soil, 30 green bean seeds, fertiliser, water

**Steps:**

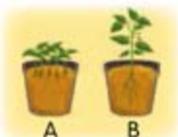
1. Label two flowerpots as A and B.
2. Plant 15 green bean seeds at a distance of 5 cm from each other in pot A and B.
3. Spread some fertiliser evenly onto the soil of pot B only.
4. Water the seeds with the same amount of water every day.
5. Compare the growth of the green bean seedlings in both pots after three weeks.

**Questions:**

1. Compare the growth of the green bean seedlings in pot A and B. State your inference.
2. What is the factor that causes the green bean seedlings to compete in pot A?



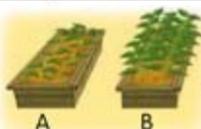
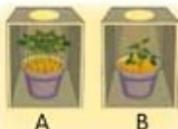
The seedlings in this small-sized flowerpot have to compete for limited space.



It seems that the roots of the green bean seedlings in pot B grow healthily due to the lack of competition for limited water.



The seedlings in pot A grow taller because they have to compete for limited sunlight.



The seedlings in pot A have to compete for limited nutrients.



Explain the factors of competition among the plants.



## Symbiosis Among Plants

Symbiosis is a close relationship between two plant species. There are two types of symbiosis. They are known as **commensalism** and **parasitism**.



### Commensalism

Commensalism is an interaction that **benefits one organism** but **does not harm nor benefit the other**.

Bird's-nest ferns grow on large branches of the host plant to obtain support and sunlight. They do not harm the host plant because the roots and stem do not penetrate the host.

Orchids grow on the trunk of the host plant for support, sunlight, and nutrients from their surrounding. At the same time, the host plant is not harmed nor does it gain any benefits.

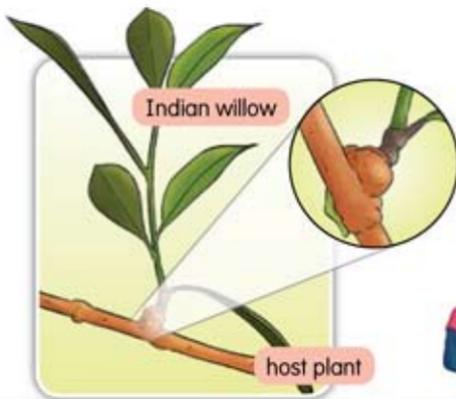


### Parasitism

Parasitism is an interaction that **benefits one organism** and **harms the other**. In this interaction, the organism that gains the benefits is called the parasite, while the one that is harmed is called the host.

Certain plants such as the Rafflesia cannot undergo the photosynthesis process. Thus, the Rafflesia needs to grow on a host plant. This harms the host plant because the Rafflesia absorbs water and nutrients from it.





Indian willow grows on the host plant to gain nutrients and water from it. This interaction is harmful to the host and it can eventually cause the branch of the host plant to die.



Describe the types of symbiosis among plants. Give examples.

## The Importance of Interaction Among Living Things to the Ecosystem



Why do living things need to interact with each other?

Interaction in the form of competition and prey-predator can **control the population of organisms** in a habitat.



The rat population in oil palm plantations can be controlled with the presence of predators such as owls.



owl

The living things in an ecosystem interact with one another to **ensure the survival of their species**.



In a pond, the large fish depend on the small fish to ensure the survival of their species. How do the small fish and the tadpoles ensure the survival of their species?



Competition among plants allows the most resilient plants to survive and produce quality breed of seedlings. Thus, **natural resources** can be maintained.



In a forest habitat, the trees that are best adapted will live and multiply.



All types of interactions among living things in a habitat are important to **maintain the balance of the nature**.

Observe a particular habitat around you. Creatively, describe the importance of the interaction among living things to the ecosystem using your favourite media.



## FUN ACTIVITY

### QR Code of a Video on Interaction Among Plants



**Apparatus and materials:** computer, Internet access, printer, A4 paper

#### Steps:

1. Find and watch a video on the interaction among plants and its importance using the Internet.
2. Share the video link by generating a QR code of the video using a suitable QR generator website.
3. Print and put up the QR code at one corner of your class.

#### Questions:

1. State the factors of competition among plants.
2. Explain the types of symbiosis that take place among plants.



## FUN SCIENCE

# An Interaction Among Living Things Pop-up Card



Create an attractive and colourful pop-up card creatively to show the interaction among living things. You can search the Internet or look in newspapers or magazines for pictures of animals.



## MIND REFLECTION

1. Interaction among living things is a relationship among living things that depend on each other.
2. There are three types of interactions among animals:
  - prey-predator
  - intraspecies and interspecies competitions
  - symbiosis which are mutualism, parasitism, and commensalism
3. There are two types of interactions among plants:
  - competition to obtain water, sunlight, nutrients, and space
  - symbiosis which consists of commensalism and parasitism
4. The importance of interaction among living things to the ecosystem are as follows:
  - to control the population of organisms
  - to ensure survival of the species
  - to maintain the growth of natural resources
  - to restore the balance of nature

**Answer all questions in the Science exercise book.**

1. Complete the definition of interaction among living things below.

Interaction among living things is a (a) \_\_\_\_\_ among living things that (b) \_\_\_\_\_ on one another.

2. Match the type of interaction with the correct information.

Type of Interaction

Situation

Prey-predator

Compete for limited number of mates

Intraspecies competition

Cheetahs hunt gazelles

Interspecies competition

Competition between vultures and lions

Symbiosis

Remoras get free transport from sharks

3. An interaction that benefits one organism but does not benefit nor harm the other organism can be explained by the symbiosis between:

(a) cats and ticks.

(b) crocodiles and birds.

(c) crabs and barnacles.

(d) clownfish and sea anemones.

4. Complete the types of symbiosis between animals in the table below.

Types of symbiosis		
Benefits both organisms	Benefits one organism but harms the other.	Benefits one organism but does not benefit nor harm the other.
Example:	Example:	Example:

5. Explain the interaction among plants by stating the types of interactions of specific plants.