Exploring Science Series for Key Stage 1 is written to meet the requirements of new National Curriculum. This intends to cover the contents of the Science Syllabus.

The series consist of three books, for grades 1, 2 and 3. The series enable students to acquire knowledge, skills and attitudes so as to develop an informed and critical understanding of, environment, science and technological issues.

The series aims to cultivate humane and responsible attitudes and an appreciation of the world in accordance with Islamic principles and values.

It is envisaged that teachers use this series as an aid to teach science adopting inquiry approach where students are encouraged to be actively involved in the learning process.

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Aa’salaam alaikum Aslam. How is your cat doing? How often do you feed your cat?

Its doing fine. I feed my cat three or four times a day. Living beings need food, water and air to live.

Do you know that living beings are called organisms?

Yes. Animals, plants and human beings are called living organisms.
Living and Non-living Beings

Living beings

Plants, animals, insects and human beings, all are living beings. Living beings have life in them.

Non-living beings do not have life in them. Chairs, tables, swings, stones are all examples of non-living beings.
Activity

Nature walk!

Go to a garden with your teacher. Make a list of 4 living and 4 non-living beings.

<table>
<thead>
<tr>
<th>Living beings</th>
<th>Non-living beings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _________________</td>
<td>1. _________________</td>
</tr>
<tr>
<td>2. _________________</td>
<td>2. _________________</td>
</tr>
<tr>
<td>3. _________________</td>
<td>3. _________________</td>
</tr>
<tr>
<td>4. _________________</td>
<td>4. _________________</td>
</tr>
</tbody>
</table>

Life processes in living beings

There are many life processes in living beings which help them stay alive. They are:

<table>
<thead>
<tr>
<th>Life processes in living beings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition</td>
</tr>
<tr>
<td>Growth</td>
</tr>
<tr>
<td>Breathing</td>
</tr>
<tr>
<td>Reproduction</td>
</tr>
<tr>
<td>Movement</td>
</tr>
<tr>
<td>Sensitivity</td>
</tr>
<tr>
<td>Excretion</td>
</tr>
</tbody>
</table>

Key Competency: Making meaning

Understanding the factors which make a living thing to stay alive
Nutrition

All living beings need nutrition from food and water. Food gives them energy and help them grow.

Different living beings eat different types of food.


What happens when you do not eat something for a long time?

________________________________________________________________________

When you are hungry or thirsty, do you have enough energy to work or play?

________________________________________________________________________

Can we live without food or water?

________________________________________________________________________
Plants are living beings. They need food and water to grow.

How do they get their food? Plants are so special that they are the only living beings which can make their food on their own.

Discuss in your class how are artificial plants different from real plants.

Key Competency: Practising Islam

Do they not see the birds above them with wings outspread and [sometimes] folded in? None holds them [aloft] except the Most Merciful. Indeed He is, of all things, Seeing (Quran 67:19)

Movement

All living beings can move from place to place on their own, except plants. Living beings move to find food, take shelter or escape from danger.

Activity

Movement in animals and plants

Observe a bird, a cat and an insect. Do they all move? How do they move?
Living and Non-living Beings

Chapter 1

Do they remain at the same place always?

________________________________________________________________________

Now, observe the plants. Do they move?

________________________________________________________________________

Now, look at the wall, bench or any other object in your classroom. Do they move?

________________________________________________________________________

Activity

Plants show movement

Materials required: Seeds that can easily grow, 2 similar trays with soil, 2 shoe boxes with a lid (same size) and water
Procedure:
Cut a hole at one end of a shoe box and keep the other shoe box as it is.

Plant the seeds in the soil trays.
Keep the trays in the shoe box.
Cover the shoe box (with the hole) with the lid.
Leave the other box open. Do not cover this box.
Water both the trays regularly and keep them at a well lit place.
Observe what happens and record your observations in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Tray 1</th>
<th>Tray 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What can you conclude from this activity?
Non-living beings do not move on their own. A rabbit moves on its own but a teddy bear cannot move on its own.

**Circle (○) the things which move around. Are they all living beings?**

- Car
- Ant
- Hammer
- Baby
- Cloud
- Air
- Banana
- Cat

**Growth**

Living beings get nutrition from the food they eat. They also grow in size. Some living beings also undergo change in their appearance.

- A tadpole grows into a frog
- A kitten grows into a cat
Look at the growth of the hen. Write a line about it.

Sensitivity

Plants and animals too respond to the conditions in their environment, as you do.

You can feel hotness and coldness.

A tortoise goes back in its shell the moment it senses danger.

Plants grow towards sunshine.

Breathing

All living beings like human beings, plants, animals, birds and even insects need air to live.

Activity

Breathing for Life!

Look at the pictures and discuss how each of these living beings breathe.
Human beings breathe through ________________

Birds breathe through ________________

Fish breathe through ________________

Plants breathe through ________________

Do non-living beings need air to live? ___________

**Excretion**

All living beings remove waste materials from their bodies in the form of faeces, urine or sweat.

The process of removing wastes from the body is known as excretion. This process is important for living beings to stay healthy and fit.
Reproduction

All living beings have young ones.

Just like human beings, animals also have young ones. The process of producing young ones is known as reproduction.

Reproduction in animals

Some animals lay eggs and do not give birth to the young ones. These eggs are hatched and the young ones come out of it. Sparrows, crocodiles, fish, frog and chicken are some examples of animals that lay eggs.
Activity

Classify the animals!

Classify the following into two groups.

Elephant  Duck  Tortoise  Eagle  Horse  Butterfly  Crab  Parrot

Lay eggs  Give birth

Key Competency: Thinking critically and creatively
Relates how various organisms reproduce.

Key Competency: Using technology and media
Gather information from various sources.
Reproduction in plants

Plants produce seeds. The seeds are formed either in flowers or in the fruits of the plants. Baby plants grow from these seeds.

Seed from a fruit grows into a plant

So, is everything around in this garden living?  No, look around and you will see both living and non-living beings in this garden.

Circle the non-living beings in the above picture.
New Words

**Nutrition:** substances that you take into your body as food

**Reproduction:** the process of producing young ones

**Excretion:** the process of removing wastes from the body

Explore Deeper

Read the following sentences and say if it’s a living or a non-living beings?

1. A toy car moves on its own. Is it a living or a non-living being? Give reasons.
2. A car needs fuel for energy. Is it a living being? Why?
3. When you blow air in a balloon, it expands and becomes big. Is it a living being? Why?
Warm Up

Our Earth is home to different kinds of animals. These animals live in different habitats.

There are so many different types of animals around us. Each animal is unique which means that each animal has special features which helps it to survive.

Each animal lives at a specific place. For example, fish lives in water, cats live on land and earthworms live in the soil. The natural home of an animal is known as its habitat.
On the basis of common characteristics, we can divide animals as:

**Fish**
- Live in water
- Breathe with gills
- Body is covered with scales
- Lay eggs in water

Examples: goldfish, catfish, seahorse

**Reptiles**
- Live on land and swim in the water
- Breathe with lungs
- Body is covered with scales or have a scaly skin
- Lay eggs

Examples: lizard, tortoise, snake and crocodile

**Mammals**
- Live on land and can swim in water
- Breathe with lungs
- Body is covered with hair
- Give birth to babies and feed them on milk

Examples: cat, tiger, human beings, whale and bat
Amphibians
• Live both on land and in water
• Breathe under water through tiny holes in the skin. Also breathe on land with lungs
• Lay eggs in water
• Body is covered with moist skin.
Examples: frog, toad and newt

Birds
• Live on land, swim in water and fly in air
• Breathe with lungs
• Body is covered with feathers
• Lay eggs in nests
Examples: parrot, sparrow and pigeon
**Mammals**

Mammals have some common characteristics like:

- Their body is covered with fur or hair.
- They give birth to young ones.
- They nurse their young ones with milk.

These are some mammals.

![Cat](image1)  ![Horse](image2)  ![Seal](image3)

Have you observed where do animals live? Some animals live on land, and some live in water.

**Marine mammals**

Mammals which live in water are known as marine mammals. Marine mammals have following features:

- Most marine mammals live in salt water
- Breathe air
- Have babies
- Feed young ones with their milk
These are some marine mammals.

**Reptiles**

Animals like snakes, iguana and lizards are called reptiles.

Reptiles are covered with scales all over their body.

Reptiles lay eggs and the young ones hatch out of it.
Activity
Understanding reptiles
Can you name these reptiles?

1. 
2. 
3. 
4. 

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
Amphibians

Look at the picture of this frog. Tick (✓) the correct option.

Where does a frog live?

Land [ ]

Water [ ]

Both land and water [ ]

Some animals like frog, live both on land and in water. They are known as **amphibians**.

Amphibians have moist skin. They breathe through this moist skin. On land, amphibians breathe through their lungs.

Amphibians lay eggs surrounded by a jelly-like substance in water.

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**Key Competency: Making meaning**

Understanding the unique features of animals which makes their habitat a suitable place for them to live.
Activity

Life cycle of a frog

Label the life cycle of a frog. Use words from the box.

1. 
2. 
3. 
4. 
5.

Word Box

- Tadpole
- Eggs
- Adult frog
- Tadpole with legs
- Young frog

Fish

Fish live in water. They have special adaptations to live in water.
**Activity**

**Fish and its organs**

Match the organs of fish with their function.

<table>
<thead>
<tr>
<th>Fish organs</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gills</td>
<td>to swim easily</td>
</tr>
<tr>
<td>Scales</td>
<td>to breathe</td>
</tr>
<tr>
<td>Streamlined body</td>
<td>to keep them waterproof</td>
</tr>
<tr>
<td>Fins</td>
<td>to move faster through water</td>
</tr>
</tbody>
</table>

Label the different body parts of the fish shown in the picture.

Fish lives in water. Where do you think a fish lays its eggs? ____________________________________________________________________________.

**Birds**

Birds are unique as they have feathers, wings and beaks. Birds lay eggs. Eggs are covered with a thick shell.

Most of the birds can fly.
Activity

Identify these birds and write their Dhivehi as well as English names.

English name: ___________  English name: ___________
Divehi name: ___________  Divehi name: ___________

English name: ___________  English name: ___________
Divehi name: ___________  Divehi name: ___________
Body parts of a bird

Read aloud the body parts of a bird.

Wings and feathers help a bird to ________________.

Beaks helps the birds to catch and eat their food as they do not have teeth to bite and chew.

Activity

My investigation on birds

Name some common sea birds.

________________________  _______________________
________________________  _______________________
________________________  _______________________

What do they eat? ________________________________

Which part of their body do they use to catch food?

______________________________
Seabirds also help fishermen in catching fish. Find out how.

**Birds and their adaptations**

The special characteristics which make an animal better suited to its environment is known as its adaptations.

Birds have adaptations which make them suitable to live in their environment. Birds have a light body to fly in the air. They also have special claws to catch their food and to hold the branch of a tree.

Birds have different types of beaks which differ in shape and size. The beak has been adapted to help the bird in its way of feeding.
A duck and its webbed feet  A penguin and its webbed feet

Why do you think bird such as penguin which lives in snow has webbed feet? Discuss.

A pigeon and its claws  A woodpecker and its claws

Why do birds which sit on trees have curved claws? Discuss.

A heron and its beak  An eagle and its beak

Why do some birds such as eagle which eat flesh have curved beaks? Discuss.
**Insects**

Insects are small and tiny creatures. The body of an insect is divided into three parts—head, thorax and abdomen.

Insects have a pair of feelers on their head. They have six legs.

Some of the insects have wings to fly.

Others crawl on the ground on their legs.

The body of insects is covered with a hard covering. Insects lay many eggs at a time.
Vertebrates and Invertebrates

An earthworm looks like a snake. So, is it a vertebrate?

No, an earthworm is an invertebrate. It does not have a backbone like the snake.

Animals can also be classified as vertebrates or invertebrates.

Living beings which have backbone are called vertebrates. Mammals, birds, fish, reptiles and amphibians are vertebrates.

Living beings which do not have a backbone are called invertebrates. Earthworm, crabs, lobsters, spider and snails are invertebrates.
Special sense organs

Animals use their sense organs to survive and live in their environment. Some animals have certain defense mechanisms to protect themselves.

What happens when you try to touch a cat?

________________________________________________________________________

What does a tortoise do when you try to touch it?

________________________________________________________________________

What happens when you try to catch a butterfly?

________________________________________________________________________

Some animals have special features to detect sound from a distance.

Do you know what an echo is? It is when a sound _________________________________.

So, echolocation, means using echo to locate something. Many animals have this special ability.

Bats use echolocation to locate food. Dolphins use echolocation underwater to find food and directions.

Caring for animals

All animals have been created by Allah (SWT).
They are special gifts from Allah (SWT) and we should always value them. Discuss how we can take care of the animals in our environment.

We should never hunt or tease any animal. **Discuss how we can take care of the animals in our environment.**

**Activity**

**Care for pet animals**

Do you have a pet animal?

If not, think of an animal you would like to keep as a pet.

What care would you provide to your pet?

What would you do if your pet falls sick?

**Key Competency: Practising Islam**

Why do they not reflect on the camels and how they are created? (Quran 88:17)
New Words

**Habitat:** the natural home of an animal

**Amphibians:** animals which live on both land and in water

**Vertebrates:** animals which have a backbone

**Invertebrates:** animals which do not have a backbone

**Echo:** a sound heard after it has been reflected off a surface

Explore Deeper

1. Animals like bats, dolphins can detect changes more effectively, research and find what special ability do these animals have.

2. Select an animal of your interest and find out its adaptation features.

    Present to the class.
Project Idea

Adaptations in birds

In groups, select a land and a sea bird. Find out how they are adapted to their environment. You may look in to beak, claws, feet and its feathers.

Give a presentation to your classmates on your project.

Key Competency: Thinking critically and creatively

Understanding how birds are adapted to their way of life.
Notes