Archana Shukla

This is my book

I am ..................................................
I am in class ....................................

Hands-on Learning in Science
Wow! Science, the series, attempts to present Science through comprehensive and wide ranging content and related activities that provide a joyful learning experience to our young learners. The series follows the recommendations of the National Curriculum Framework (NCF) 2005.

Learning of Science is based on themes that students can relate to in their everyday experiences, and to the commonly observed phenomena in nature. These themes encompass a core body of concepts across both, the life sciences and physical sciences.

The focus of each theme is given below.

**DIVERSITY**
There are many living and non-living things in the world. Man seeks to organise these living and non-living things for better understanding of the world he lives in. There are connections among all living things and integrating factors in the variety of non-living things, that help us to classify them. This theme elaborates the importance of diversity.

**CYCLES**
Nature is full of repeated patterns of changes. We call these patterns ‘cycles’. For example, the life cycles of living things, the water cycle, etc. We can predict events and processes once we understand these cycles. This understanding also helps us to appreciate the Earth as a self-sustaining system.

**SYSTEMS**
Various parts that work together to perform a function(s) makes a system. There are man-made systems as well as natural systems. The digestive and respiratory systems are examples of natural systems, while an electrical systems are man-made systems. Understanding systems means understanding how they work and how their various parts interact with one another to perform a particular function.
Various systems interact within themselves and with each other. This understanding helps to enhance our knowledge of the environment and the role of humans in it. Organisms interact in three ways: within an organism, among various organisms, and between organisms, and the environment. The interaction of humans with the environment has led to the development of Science and Technology. Also, the way humans interact with the environment is influenced by Science and Technology. By understanding the interactions between humans and their environment, students can become aware of the consequences of their actions as they learn to take responsibility for these actions.

**Energy**

Changes and movements in everyday life are made possible due to energy. Humans use various forms of energy for various activities. Not just humans, but all living things need energy to carry out life processes. This theme will allow students to appreciate the importance and uses of energy and the need to conserve it. Appropriate links are included across the five themes to help learners connect their learning with the experiences about the world around them that they would gradually acquire.

**I Wonder**

Hands-on activities involving experiments, making observations collecting data, model making, and project work

**Building Block**

Observing, analysing, interpreting and making models to build the understanding of the concepts learnt

**Interactive approach**

Helps to engage learners and help them connect to scientific ideas

**I Have Learnt**

Concept maps that summarise and link all the concepts learnt in a chapter

**Worksheet**

A useful worksheet at the end of each chapter for additional formative evaluation

**Connecting Science**

Interdisciplinary activities based on linkages with other subjects within the curriculum
# Understanding the Book

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| Chapter 1  
Classifying Things | • What is classification?  
• Classifying things in different ways  
• Separating objects to arrange them in groups  
• Categorising things using tables and diagrams | ✓              | ✓             | ✓       | ✓                                            | ✓         |              |
| Chapter 2  
Living and Non-living Things | • Living Things  
• Non-living Things  
• Characteristics of Living and Non-living Things | ✓              | ✓             | ✓       | ✓                                            | ✓         | ✓            |
| Chapter 3  
Plants | • Different parts of a plant  
• Characteristics of plants  
• How plants are similar yet different  
• Flowering and non-flowering plants | ✓              | ✓             | ✓       | ✓                                            | ✓         | ✓            |
| Chapter 4  
Animals | • The characteristics of animals based on their physical appearance  
• To classify animals on the basis of different observable characteristics  
• To discriminate between animals on the basis of their outer appearance  
• To categorise animals into separate groups based on their movement | ✓              | ✓             | ✓       | ✓                                            | ✓         |              |
| **Unit 2: Cycles**        |                                                                         |                |               |         |                                             |           |              |
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Matter | • What is matter?  
• What are the states of matter?  
• What are the characteristics that a matter must have?  
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| Chapter 6  
Water | • Water exists in three forms.  
• What is water cycle?  
• Why is water a precious resource?  
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| **Unit 3: Systems**       |                                                                         |                |               |         |                                             |           |              |
| Chapter 7  
Human Body Systems | • What are organs?  
• What are our body’s organ systems?  
• What are the functions of different organ systems?  
• How do the organ systems work together? | ✓              | ✓             | ✓       | ✓                                            | ✓         | ✓            |
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<td>• What are the different types of roots?</td>
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<td>• What are the functions of each part of the plant?</td>
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<td>• How do parts of plants work together like a system?</td>
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<td>• How to measure length, mass, volume and time</td>
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<td>• Units of length, mass, volume and time</td>
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<tr>
<td>Chapter 11 Our Environment</td>
<td>• Organism, population, community, habitat, food chain, what makes up an environment (air, water and land), pollution, types of pollution, save environment</td>
<td>✓</td>
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<td></td>
<td>• What are different forms of energy?</td>
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<td>Chapter 13 Light</td>
<td>• Sources of light</td>
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<td></td>
<td>• Light helps us to see the things</td>
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<tr>
<td></td>
<td>• Light travels in a straight line</td>
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<tr>
<td></td>
<td>• Shadow formation</td>
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<td>• Transparent, translucent and opaque objects</td>
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<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<td>• What are pleasant and unpleasant sounds?</td>
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<tr>
<td></td>
<td>• How is sound useful to us?</td>
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**Unit 4: Interactions**

**Unit 5: Energy**
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Look at Jigyasa’s room! It is so messy. Do you think Jigyasa can make it neat and tidy?

Jigyasa has put the similar things into groups and at proper places. How does her room look now? Is it neat and tidy?

Well, she has arranged all the books together, stacked all the pens and pencils in the pen stand, kept the table lamp and calculator on one side and her soft toys are now in the toy rack.

To tidy up the room, Jigyasa has arranged her things in different groups on the basis of their uses.

**Grouping Things**

When we put things into groups, we classify them. Arranging things into groups on the basis of their characteristics is called **Classification**.

A **characteristic** is the quality of a person or thing. It tells about the way something is or behaves.

We classify things on the basis of similarities and differences in their characteristics. Shape, size, colour, use, and purpose are some of the characteristics of things.
Things with similar characteristics are grouped together.  
A pen and a pencil have the same purpose. Both are used to write. Jigyasa has put all the pens and pencils together in a pen stand on the basis of their use.  
She has kept all the books together but not with the soft toys, because books and soft toys have different uses.

**How to Classify**

The teacher has divided her students into three groups and asked them to arrange the books on different shelves.
Let’s see what they have done. Students of each group have arranged the books on the shelf in a different way.

Students of Group 1 have arranged the books on the basis of similarities and differences in the colour of the books.

Students of Group 2 have arranged the books on the basis of differences in their sizes.

Students of Group 3 have put the story books, text books and dictionaries on separate shelves. They have arranged the books on the basis of their purpose.

Books can also be grouped as per the frequency of use. The books that are not used very often are kept on top where it is difficult to reach.

If you were asked to arrange your books on the bookshelf, how would you do it? Give reasons for your answer.

**Think Science**

How will you classify the following clothes in different ways? Which characteristics will you choose to classify them? How many different characteristics can you list?
Why Do We Classify?

Classification helps us understand the diversity around us.

We can classify all things in this world in two categories living and non-living things. It helps us to understand the similarities and differences between various things. It allows us to sort and group organisms for easier study.

How to Show Classification

We can show classification of things using tables, diagrams and flowcharts.

Table

<table>
<thead>
<tr>
<th>Wooden Items</th>
<th>Plastic Items</th>
<th>Electronic Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>bed</td>
<td>lunch box</td>
<td>television</td>
</tr>
<tr>
<td>wardrobe</td>
<td>tumbler</td>
<td>cell phone</td>
</tr>
<tr>
<td>shoe rack</td>
<td>water bottle</td>
<td>computer</td>
</tr>
</tbody>
</table>
I Have Learnt

- Classification means putting things into groups based on their characteristics.
- It helps us to organise things and learn about their similarities and differences.
- We can classify all things as living or non-living.
- Characteristics that can help us to classify are:
  » shape
  » size
  » colour
  » use
  » purpose
- We can show classification using tables, diagrams, and flowcharts.

Science Words
- Classification • Characteristics • Diversity • Tables • Diagrams • Flowcharts

Evaluate

A. Objective type questions

Tick (✓) the correct options.

1. Arranging things into groups on the basis of their characteristics is called .................. .
   a. classification
   b. categories
   c. groups
   d. none of these

2. We classify things on the basis of ..................... .
   a. similarities in characteristics
   b. differences in characteristics
   c. both of these
   d. none of these
3. .......................... helps us understand diversity.
   a.  Groups
   b.  Classification
   c.  Characteristics
   d.  Universe

B. Short answer questions

1.  Answer the following in one word.
   a.  What is the quality of a person or thing called?
   b.  All the things in your surroundings are grouped into two categories: living and non-living. What is the process of grouping things called?
   c.  There are a variety of things in our surroundings. Name the scientific term that has been used in the chapter to refer to the variety.

2.  There are different ways to classify things. Name them and give one example for each.

3.  We can classify things on the basis of different characteristics. Name any three characteristics and explain one with an example.

C. Long answer questions

1.  What characteristics can be used to classify things?

2.  What is classification? Explain with an example.

D. HOTS

A toy seller has arranged toys on various shelves. On what basis have the toys been classified? Classify these toys in as many different ways as you can, on the basis of different characteristics.

💰 25 each

💰 50 each

💰 75 each
I WONDER

Investigate

I will: Classify objects on the basis of their characteristics.
I need: Bottles of various sizes and colours.
I do: Collect empty bottles of various sizes and colours found in your home. Classify them, first on the basis of various sizes and prepare a chart.
I observe: Record observations according to the charts given. Add more rows if required.

<table>
<thead>
<tr>
<th>Colour of the bottles (red/yellow/green and so on)</th>
<th>Number of bottles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Size of the bottles (small/medium/large)</th>
<th>Number of bottles</th>
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</table>

I conclude: I can classify the bottles on the basis of ................. and ................. .

Suggested Activity

Visit your school garden and observe the surroundings. Make a list of 20 things that you see there. Classify them in different categories based on their characteristics. How would you show your classification? Present it to your class in a table or a flow chart.

Project Work

1. Take a few gram seeds and buttons. Bury them in the soil. Water them for two to three days. Write your observations in your notebook.
2. Make a model of ‘Ways to Classify’ using assorted buttons or coloured bindis.
A. Answer the following questions.

1. Jigyasa wants to read her favourite storybook, *Rapunzel*, but when she enters her study room she finds it messy. What should she do so that she can find her favourite book easily?

   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................

2. Chinmaya has put his colours, art and craft materials in different groups. It helps him in his art and craft period. How?

   ........................................................................................................................................
   ........................................................................................................................................
   ........................................................................................................................................
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B. Classify the following things into four groups and name each group. One has been done for you.

<table>
<thead>
<tr>
<th>Group 1: vehicles</th>
<th>Group 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>car</td>
<td>bus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group 3:</th>
<th>Group 4:</th>
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</table>

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|                       |                       |
I have a teddy bear and Chinmaya has Bunny, a rabbit. My teddy bear does not need food and water but Bunny does. Also, her teddy bear cannot do things which my Bunny can. This is because your Bunny is alive but her teddy bear is not.
Things that are **alive** – such as birds, animals, fish, insects, plants and we humans – are called living things. Things that are **not alive** – such as table, water bottle, lunch box, stone and so on - are called non-living things. Some non-living things are natural and some are man-made.

**Living things**

**Non-living things**

**Characteristics of Living and Non Living Things**

What are some things that all living things have in common? What do living things need to stay alive?

Is a fish a living thing? What does a fish need to stay alive? A fish is a living thing so it needs air, water and food to stay alive.
Living Things Need Air, Water and Food

All living things need air, water, and food to stay alive. If they do not get enough air, food, or water they will die.

Water helps plants to get food from soil.

There is a butterfly in the basket. The lid of the basket has holes for the butterfly to breathe.

The butterfly can breathe but cannot find its food inside, so it will die.

We must open the lid and let it fly away.

All living beings need food to stay alive.

A grasshopper eats leaves.

Some animals eat other animals to stay alive.
Look at this chalk box. Many chalk pieces are packed inside the box. The box is packed with no holes for air to pass. Will this affect the chalk pieces?

**Living Things Grow**

Non-living things do not need air and water. Non-living things do not need food either, as they do not grow.

Chalk pieces do not need air, water and food as they are not alive.

Jigyasa becomes taller because she is a living being but the chalkboard does not because it is non-living. **Living things grow but non-living things do not.**

As living things grow they may increase in height, weight, and size and may also change in their appearance.

Earlier, I was a small baby. As I grow, I will become a man.

A seed grows into an adult plant.
Living Things Move by Themselves

Animals move from place to place for food, air, water, shelter, and sunlight. Some animals move using their limbs. Birds and some insects fly using their wings. Fish swim with their fins. Human beings walk on their legs.

Rohan was playing football in the Sun. Is he perspiring (sweating)? Will his ball also feel the same? He is perspiring because his body is responding to the heat. His ball does not feel the heat and will not perspire.

Living Things Respond to Changes in their Environment

Plants and animals always respond to changes in surroundings. Look at the response of Mimosa (Touch-me-not) plant to human touch.

If I don't push it, can this table move by itself?

A table cannot move until you push or pull it, as it is not alive. Non-living things cannot move by themselves.

Mimosa (Touch-me-not) plants close their leaves when touched.
Similarly, a sunflower plant responds to the sunlight by turning its flower towards sunlight.

Non-living things do not respond to changes around them.

We learn about the world around us using our sense organs: eyes, ears, nose, tongue, and skin. They help us to respond to everything around us.

In a sunflower field, you can see all the flowers facing in one direction - the direction of the Sun.

**Assess**

Observe 5 things in your surroundings and discuss.

a) How do they respond to the changes around them?

b) Are they living or non-living things?

**Living Things Reproduce**

*Chacha, after I eat an apple, it is gone. How do I keep getting more and more apples?*

*Jigyasa, have you noticed the seeds of an apple? When these seeds are put in the soil, they germinate and grow into a new plant that produces more apples.*

Plants generally reproduce by seeds.
Living things produce young ones of their own kinds. This process is called **reproduction**. Animals reproduce by laying eggs or giving birth to young ones.

Birds lay eggs to reproduce.

Elephants and cows give birth to young ones.

**Info Bit**

Ostrich eggs are the largest of all bird eggs. On an average, they are 15 centimetres (5.9 inches) long, 13 centimetres (5.1 inches) wide, and weigh 1.4 kilograms.

**Think Science**

Categorise the given things into living and non-living.

a) mangoes on a tree  
b) mangoes in a bowl  
c) wooden log  
d) tree

On what basis, did you classify them?  
Do you find any similarity between (a) and (b), or between (c) and (d)?
A. Objective type questions

Tick (√) the correct options.

1. Which of the following is a living thing?
   a. toy  
   b. cat  
   c. table  
   d. pencil
2. Which of the following needs air, water and food to live?
   a. pen  
   b. plants  
   c. paper  
   d. scale
3. A ......................... can move on its own.
   a. TV  
   b. donkey  
   c. bottle  
   d. desk

B. Short answer questions

1. List the characteristics of living things.
2. Correct the following sentences.
   a) Animals which do not have legs cannot move by themselves.
   b) Plants do not have mouths and so they cannot eat. Therefore they do not need food.
   c) Cows do not lay eggs like hens, so cows do not reproduce.
3. How do apple plants germinate?
4. What happens to the sunflower when the Sun is in the West?
5. Look at the picture and the table given below. It shows the changes in height of human beings over a period of time. Observe them carefully and answer the following questions.

<table>
<thead>
<tr>
<th>age</th>
<th>height</th>
</tr>
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<tbody>
<tr>
<td>6 months old</td>
<td>60 cm</td>
</tr>
<tr>
<td>2 years old</td>
<td>90 cm</td>
</tr>
<tr>
<td>4 years old</td>
<td>110 cm</td>
</tr>
<tr>
<td>12 years old</td>
<td>140 cm</td>
</tr>
<tr>
<td>25 years old</td>
<td>170 cm</td>
</tr>
</tbody>
</table>

a) What does the graph tell us about human beings?
b) According to the data given, what is the maximum height of human beings and at what age does it occur?
c) What does the baby need to grow and stay alive?
d) What are the other changes which would be observed in human beings over the years, besides height?

C. Long answer questions

1. The potted plant and garland both have flowers. What are the similarities and the differences between the two? Explain.

2. Observe pictures A and B. Write two similarities and two differences between them.

3. Jigyasa observed that a deflated football increased in size when filled with air. She said that increase in size shows that a ball can grow. Is she correct? Explain your answer.

D. HOTS

Jigyasa has put a caterpillar, a fruit fly, a potted plant, and a dish of water in a glass tank with a small hole.

a) What do a potted plant, a caterpillar and a fruit fly need to stay alive?
b) Where should the glass tank be placed? Give reasons for your answer.
c) Would all the living things inside the glass tank be alive after one week?
d) What will happen if the small hole is covered with
   i) A very thin cotton cloth
   ii) A glass sheet
I wonder

Living things become non-living when they die. You can take the example of wood which is non-living was made from a tree which was living. Make a list of at least 5 other things in your surroundings that were living and have now become non-living.

Investigate

I will: Observe that living things grow.
I need: Water, green gram (moong) seeds, cotton, a plate and bowl.
I do:
1. Soak 10–20 green gram (moong) seeds in water for 5–6 hours and drain the water.
2. Cover a plate with wet cotton and keep the green gram (moong) seeds on it.
3. Keep the plate in a warm place.
4. Measure the height of the sprouts formed daily, for one week.
I observe: the height of the sprouts ................. .
I conclude: ..................... grow.

Suggested Activity

Living things become non-living when they die. You can take the example of wood which is non-living was made from a tree which was living. Make a list of at least 5 other things in your surroundings that were living and have now become non-living.

Project Work

- Fill a pot with soil.
- Add four kidney bean seeds and push them about one centimetre into the soil.
- Water the seeds every day.
- Observe and record how the seeds grow.
Answer the following questions.

1. Compare a rose plant with a climber. Write the similarities and the differences between the two.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

2. You can see many things in the given picture. Classify these things into two categories. Give reasons for your classification.

<table>
<thead>
<tr>
<th>.......... things</th>
<th>.......... things</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Reasons:

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................................................................................................................................................
Wow! This is such a beautiful garden. I see so many plants here, a variety of creepers, climbers and flowers too.

Did you notice, some plants have flowers and some don’t.

Are all the plants in the picture similar or different?
There are a variety of plants in the world. All plants are similar yet different. They have some common characteristics such as:

a) All plants are living things.
b) They need air, water, sunlight, and food to stay alive.

Plants can be similar or different in some ways, such as:
• the way they look (shape, size and colour of their parts)
• whether they bear flowers or not

Info Bit
Plants come in different sizes. Some plants are tiny and some are large.
The largest tree in the world is a giant sequoia (Sequoiadendron giganteum) in California’s Sequoia National Park, called General Sherman. The tree is about 52,500 cubic feet (1,487 cubic meters) in volume.
Yes, they do! Although their structure, colour, and size may differ.

Do all plants have the same parts?

Do you know, we eat different parts of plants?

Look at these fruits and vegetables. They are leaves and roots of plants. Do they look the same?

The leaves and roots of different plants can be different or similar, too.

**Roots**

Roots are usually found under the ground. They absorb water and nutrients that a plant needs from the soil. Roots hold the plant firmly in the soil.
Aerial roots of banyan tree support the tree, while aerial roots of mangroves are for taking in air.

**Stems**

The stem of a plant is usually found above the ground. The stem has branches and leaves, and bears fruits too.

Do stems of different plants look alike? No! Stems differ from plant to plant.

Some plants have a strong stem called a trunk that keeps the plant straight upright. Plants that have a trunk are called **trees**. Some plants have very weak stems so they use plants, walls, and fences for support. The ones that climb up with support are called **climbers**. The others that just creep along the ground are called **creepers**.
Leaves

Chinmaya, these leaves differ in their shapes and sizes. Do all plants have different kinds of leaves?

Yes, leaves of different plants differ in many ways.

Sometimes we identify plants by their leaves.

Think Science

The leaves of some plants have special smells: some have a pleasant smell and some a have bad smell. Some pleasant - smelling leaves are used in cooking. Does your mother use such leaves in cooking delicious food for you?

Name 3 plants with pleasant-smelling leaves, that are used in making food.

1. ____________________ 2. ____________________ 3. ____________________

Flowers

Flowers are usually the most beautiful part of a plant. Flowers have different appearance, colours and fragrance.

Rose  Sunflower  Bluebells

Dahlia  Lily
Some flowers are bright in colour, some are dark and some are shaded.

Some flowers have a pleasant smell. Some flowers have a very unpleasant smell.

Some plants bear a single flower on one flower stalk. Some flowers grow in a bunch or in a cluster.

Chinmaya, look at this plant; it does not have any flower, only leaves.

Jigyasa, some plants do not bear flowers.

Many plants produce flowers and they are called **flowering plants**. Some of them do not produce flowers and they are called **non-flowering plants**, such as, ferns and mosses.

Some plants produce flowers only after many years.

Agave Americana is a common ornamental plant. It takes around 10 years to bloom.

The Talipot palm flowers only once in its 30-80 years lifespan.
Do flowering and non-flowering plants differ in any other way?

**Plants**

- **Flowering Plants**
  - All flowering plants bear fruits

- **Non-flowering Plants**
  - Non-flowering plants do not bear fruits

Rose and lily plants also bear fruits, but usually we do not see them as we pluck these flowers for other purposes.

**Science Talk**

Some flowers are classified based on their purposes.

People often use jasmine to make flavoured tea, oils, and medicines. Rose is used for flavouring food, decoration and making perfumes and cosmetics.

**Building Block**

Visit the parks and gardens in your surroundings. Draw the flowering plants. Mention how they are different or similar.

<table>
<thead>
<tr>
<th>Differences</th>
<th>Similarities</th>
<th>Draw here</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fruits bear seeds that grow into new plants. The fruits of some flowering plants - such as mango and apple - are edible.

The fruits of some flowering plants - such as soapberry and thorn apple (Datura) - are inedible.

**Info Bit**

The jackfruit has been determined to be the largest tree fruit in the world. The jackfruit can weigh as much as 45 kg. There have been jackfruits that have grown as big as 4 feet in length!

**I Have Learnt**

- Plants are living things. They can be similar or different.
- Classification of plants
  - Shape, size, colour of the parts
  - Flowering, non-flowering

**Leaf:** Makes food for the plant (photosynthesis).

**Fruit:** Contains and protects the seeds.

**Stem:** Holds the plant upright, supports leaves and branches, and transports water mineral salts and food.

**Science Words**

- Roots
- Aerial Roots
- Aeration
- Stems
- Creepers
- Climbers
- Leaves
- Flowers
- Flowering
- Non-flowering plants
- Fruits
Evaluate

A. Objective type questions

Tick (√) the correct options.

1. Which part of a plant helps in making food?
   a. leaves  
   b. stem  
   c. roots  
   d. flower  

2. Which part of a plant helps in absorbing water and minerals?
   a. roots  
   b. flower  
   c. leaves  
   d. stem  

3. Name the part of a plant that bears seeds.
   a. flower  
   b. fruit  
   c. leaf  
   d. stem  

B. Short answer questions

1. Give two examples of edible and inedible fruits of some flowering plants.
2. Name the tree which has extra roots that hang in the air.
3. What is a trunk? What does it do?
4. Look at the picture of the plant and answer the questions:

   a) What type of plant is this?
   b) What kind of stem does it have?
   c) Why does the plant go around the stick?
C. Long answer questions
1. Differentiate between flowering and non-flowering plants.
2. Riya has studied some of the characteristics of a few plants around her. She has made an observation table.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Plant ‘A’</th>
<th>Plant ‘B’</th>
<th>Plant ‘C’</th>
<th>Plant ‘D’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has edible fruits</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Has poisonous parts</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Has soft and weak stem</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Has strong stem</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

When Yash looked at the table, he noticed that plant ‘D’ was not classified correctly. He said, “How can a plant be both poisonous and edible?”
Answer the questions given below:
a) Was Yash correct? Give reasons.
b) Not all plants with strong stems are trees, are they? Explain.
c) State the similarities and differences between plant ‘A’ and ‘D’.
d) Based on the given table, write down the characteristics of plant ‘B’.

D. HOTS
If you have been given a chance to choose the plants to grow in your school playground, which one of the following plants will you choose? Why?
a) Mango     b) Banana     c) Eucalyptus

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Investigate

I will: Observe and identify the diversity of plants.
I need: Pencil and notebook
I do:
1. Go to the school garden with my teacher for a group activity.
2. Mark an area of the school garden to explore.
3. Count the number of different kinds of plants in that area.
4. Record my data and data collected by other groups in the given table.
I observe: Plant diversity in school garden.

<table>
<thead>
<tr>
<th>Group</th>
<th>Description of the area</th>
<th>Number of kinds of plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I conclude:

a) The area in the school garden which has the greatest diversity of plants is .................................................. as it has ..................... different kinds of plants.

b) The area in the school garden which has the least diversity of plants is ............................................. as it has only ......................... different kinds of plants.

Suggested Activity

Make a list of the food items that you ate in the last two days. Now find out from which part of the plant they were. Were they roots, stems, leaves, fruits or flowers?

Project Work

Take a potted plant. Place it in your bedroom near the window. You may notice that the plant is bending towards the sunlight coming in through the window.

What can you do to make the plant grow upright? Think and write. Besides sunlight, what else does a plant need for healthy growth?
Answer the following questions.

1. Observe and list different kinds of plants that are found in your neighbourhood. Categorise these plants into four groups as mentioned in the following table (one example of such group has been shown to you). Observe the parts of the plants accordingly and complete the chart.

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Weak or strong stem</th>
<th>Flowering or non-flowering</th>
<th>Flowers grow singly or in a bunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mint</td>
<td>Weak</td>
<td>Flowering</td>
<td>Bunch</td>
</tr>
</tbody>
</table>

Now choose the correct words from the box to fill in the blanks.

inedible similar different

a. Same parts of plant look ......................... in different plants.
b. Parts of most plants are ......................... .
c. Fruits of some plants are ......................... .

2. Look at the plants on the right and their parts. How do they differ from each other? Do they have any similarity?

Difference ........................................................................................................................................
Similarity ........................................................................................................................................

36
There is a great variety of animals on the Earth. These animals differ from each other in many ways, including their physical appearance and habits.

**Characteristics of Animals**

Animals show great diversity in their shapes, sizes and colours. They have different body parts. They have different types of body coverings such as fur, feathers, and scales. There is also a difference in the way they move and the way they reproduce.
Descriptions of Animals According to their Sizes, Shapes and Colours

Look at animals on this page. What differences do you see in their sizes, shapes, and colours?

Animals differ in their sizes: some animals are very big, like elephants, giraffes and ostriches. On the other hand, some are very small like rats, rabbits, lizards, and squirrels.

Info Bit
One of the smallest mammals on Earth.
Name: Kitti's hog-nosed bat also known as bumble bee bat
Size: 2.8-3.3 cm
Weight: About 2 grams
Habitat: Limestone caves
This tiny bat is found in Thailand.
Animals also differ in their shapes. Different kinds of animals have different shapes. Look at these animals:

- Bee
- Starfish
- Fish
- Woodpecker
- Snake
- Dolphin
- Rhinoceros

**Science Talk**

Some living things are very tiny and cannot be seen with our naked eyes. They are called micro-organisms. They can only be seen through a microscope. Bacteria are also micro-organisms. You might have heard about bacteria but have you ever seen bacteria? Some bacteria are harmful to people. Harmful bacteria can also cause illnesses such as sore throat, diarrhoea, tooth decay, and so on. Some bacteria are useful to people. For example, some bacteria are used to turn milk into curd.

Some animals can change their body colour to match their environment.
The same type of animals can also differ in their body colour.

**Animals Vary in their Outer Body Covering**

Different kinds of animals have different outer coverings on their skin.

- **Scales**
- **Fur**
- **Shells**
- **Feathers**

**Feather**

Birds have feathers on their body as their outer body covering. Feathers give the bird its colour.

**Hair/Fur**

The bodies of lions, rabbits, squirrels and many other animals are covered with hair or fur. Hair or fur helps to control the body temperature of these animals.

**Think Science**

A bird and a snake differ in their skin and body parts. Apart from their shape, size and colour, they have another difference. What is it?

**Building Block**

Observe animals including birds around you. How do they differ in their sizes and colours? Investigate and explore why animals differ in their size.

Name the animal that you like the most. Draw this animal in your drawing book and colour it in same colours as it is in real life.

**Teacher's note**

Discuss how the colour of the animals help them to survive in different situations.
Some animals have shells as their outer body covering. Shells protect the body of the animals from the changes around them. Some animals, like the turtle, have very hard shells.

Snails and crocodiles also have scales on their bodies. Scales protect the body of a fish and make it easy for the fish to swim.

**What Do Animals Eat?**

Animals eat different kinds of food. Some animals eat grass and leaves of plants whereas some of them eat other animals.

Some animals eat grass. They are called herbivorous. They have flat teeth for grinding their food.

Some animals eat other animals. They are called carnivorous. Carnivores eat the flesh of other animals. They have pointed teeth to tear flesh.

Some animals, like bears, eat both plant products and flesh. They are called omnivorous.
Humans use their legs to move from place to place. Some other animals - such as dogs, cats, horses and cows - also use their legs to move.

Animals have Unique Types of Movements
All animals move from one place to another to get their food.

Movement Using Body Parts
Different kinds of animals use different parts of their body to move.

Dolphins, penguins and seals move using their flippers.

Why can birds fly when they flap their wings, but we can’t when we flap our arms?

Birds are very light. Their bones are hollow, and they have feathers, which help them to fly.

Humans use their legs to move from place to place. Some other animals - such as dogs, cats, horses and cows - also use their legs to move.
Some animals use all four limbs (hands and legs) to move while others move on only two legs, known as hind (back) limbs. They use their fore (front) limbs for other purposes.

**Movement Using Entire Body**

Look at this earthworm. It has neither legs nor wings or fins but it can move. How is this possible?

I Have Learnt

- Animal are living things. They are diverse. They differ from each other.

### Classification of Animals

- **Size, shape and colour**
  - scale
  - fur
  - shell
  - feather

- **Outer covering**
  - scale
  - fur
  - shell
  - feather

- **Food habits**
  - herbivorous (plant eating)
  - omnivorous (eat both plants and flesh)
  - carnivorous (flesh eating)

- **Body movement**

### Science Words

- Diversity
- Feathers
- Temperature
- Shells
- Scales
- Fins
- Flippers
- Herbivorous
- Carnivorous
- Omnivorous
- Limbs
- Forelimbs
- Hindlimb
A. Objective type questions

Tick (✔) the correct options.

1. Human skin is covered with ..........................  
   a. sand  ☐  b. hair  ☐  
   c. water  ☐  d. air  ☐

2. Fishes live in .................................  
   a. water  ☐  b. land  ☐  
   c. tree  ☐  d. sky  ☐

3. Animals move about to look for ........................  
   a. oxygen  ☐  b. air  ☐  
   c. danger  ☐  d. food  ☐

4. Study the following table. Animals are grouped on the basis of their ...........................  

   ![Animals Diagram]

   a. body movement  ☐  b. outer coverings  ☐  
   c. food habits  ☐  d. all of these  ☐

B. Short answer questions

1. How do earthworms move?
2. Name two carnivorous and two herbivorous animals.
3. Why can birds fly?
4. Different animals have different body coverings which protect them from changes in the environment around them.
   
   Classify the given animals into different categories on the basis of their body coverings.  
   dog, snake, parrot, crocodile, cat, rabbit, fish, prawns, emu, snails, pigeons

C. Long answer questions

1. What are the functions of shells?
2. What are scales? Name any two animals that have scales on their body.
3. Look at the pictures given below.
   i. 
   ii. 

   a. Identify these animals and name them.
   b. Do they look similar? If yes, in what ways?
   c. Compare the characteristics of the above animals.

4. Study the given table and answer the following questions:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Animal ‘A’</th>
<th>Animal ‘B’</th>
<th>Animal ‘C’</th>
</tr>
</thead>
<tbody>
<tr>
<td>has 4 legs</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>can fly</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>eats animals</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

   a. List the similarities and differences between animal ‘A’ and animal ‘C’.
   b. Which animal among those given above resembles a tiger in its characteristics? Give reasons.

D. Values and life skills

Some things are made from the body coverings of animals. List these things. Find out if the animals are harmed in this process.
I WONDER

Investigate

I will: Observe and identify the diversity of animals.
I need: Teacher, pencil and notebook and a place where animals live (it may be the school garden, park, pond or a zoo).
I do:
1. Walk around the place that you have chosen, in groups of three.
2. Observe the animals you see and study their body structure.
3. You can either make simple drawings of these animals or just note down their characteristics that you observe.

I observe:
Animal diversity at ____________________________
  • I observed ____________________ kinds of animals.
  • All the animals were ________________ in their _______________________.
  • The smallest animal that I observed is______________.
  • __________________________ was the biggest animal.

I conclude:
a. The animals differ in their __________, size and ________________.
b. Animals have different ______________________ on their skin.
c. Animals __________ in different ways using their __________ parts or whole body.

Suggested Activity

Compare the two groups of living things: animals and plants.
Compare yourself with an animal and a plant in terms of how you look, your ability to move from place to place and how you get food. Discuss it with your classmates.

Project Work

1. Form groups of five. Choose any animal you like. Collect all the information you can find about its food and feeding habits, including how it gets and eats the food. Organise the collected information on a chart and present it in class.
2. Make bird beaks using plasticine, clothes pegs, toothpicks, rubber bands, etc. Explore how birds can do different things with their beaks.
Worksheet

Solve the puzzle.

1. Identify these animals and name them.
   a. An intelligent water animal that uses flippers to move
   b. An animal that loves to eat bamboo sticks
   c. The animal with hardest shell
   d. A bird which has beautiful multi-coloured feathers
   e. Body covering of snakes and fishes

   A   Z   D   G   R   U   T   N   T   A
   S   B   D   O   L   P   H   I   N   R
   A   H   H   S   Y   J   I   H   C   M
   D   T   U   S   X   D   K   P   S   X
   N   R   M   A   Q   C   M   C   B   E
   A   S   N   C   O   G   A   Y   H   L
   P   A   A   C   N   L   V   X   Y   T
   A   F   A   L   E   S   D   W   R   R
   A   E   H   S   P   E   R   V   T   U
   P   P   D   R   L   K   A   E   P   T
   K   F   A   B   C   D   G   I   L   J

2. Using the given pictures complete the flowchart and identify animals P, Q, R, S and T.
Animals are an important part of our environment. Tiger is the national animal of India. Tigers occupy a variety of habitats from tropical forests, woodlands and mangrove swamps to grasslands, savannah and rocky country. Day by day, tigers are reducing in large numbers. There are many wildlife reserves in India for preserving the population of tigers. Jim Corbett is a wildlife reserve in Uttarakhand that covers a core area of 822 square kilometres and buffer area of 466 square kilometre. “Save Tiger” campaign has been one of most popular and effective campaigns in India.

Science
1. What are the characteristics of a tiger?
2. How do the stripes on the bodies of tigers help them?

Maths
1. Find out the total area of Jim Corbett wildlife reserve.
2. What is the approximate length of an adult tiger in centimetres? Take help from the Internet or your teacher.

Social Science
1. Where is Jim Corbett Wildlife Reserve located in India? Mark the place on a political map of India.
2. Name the countries where tigers are found.
3. Find out the national animals of any five countries. Take help from the Internet.

English
1. Circle the naming words in the paragraph at the beginning of this exercise.
2. Write five sentences about the national animal of India.

Art
Join the dots and colour the given animal with suitable colours.
Is this animal similar to the tiger? Give reasons for your answer.