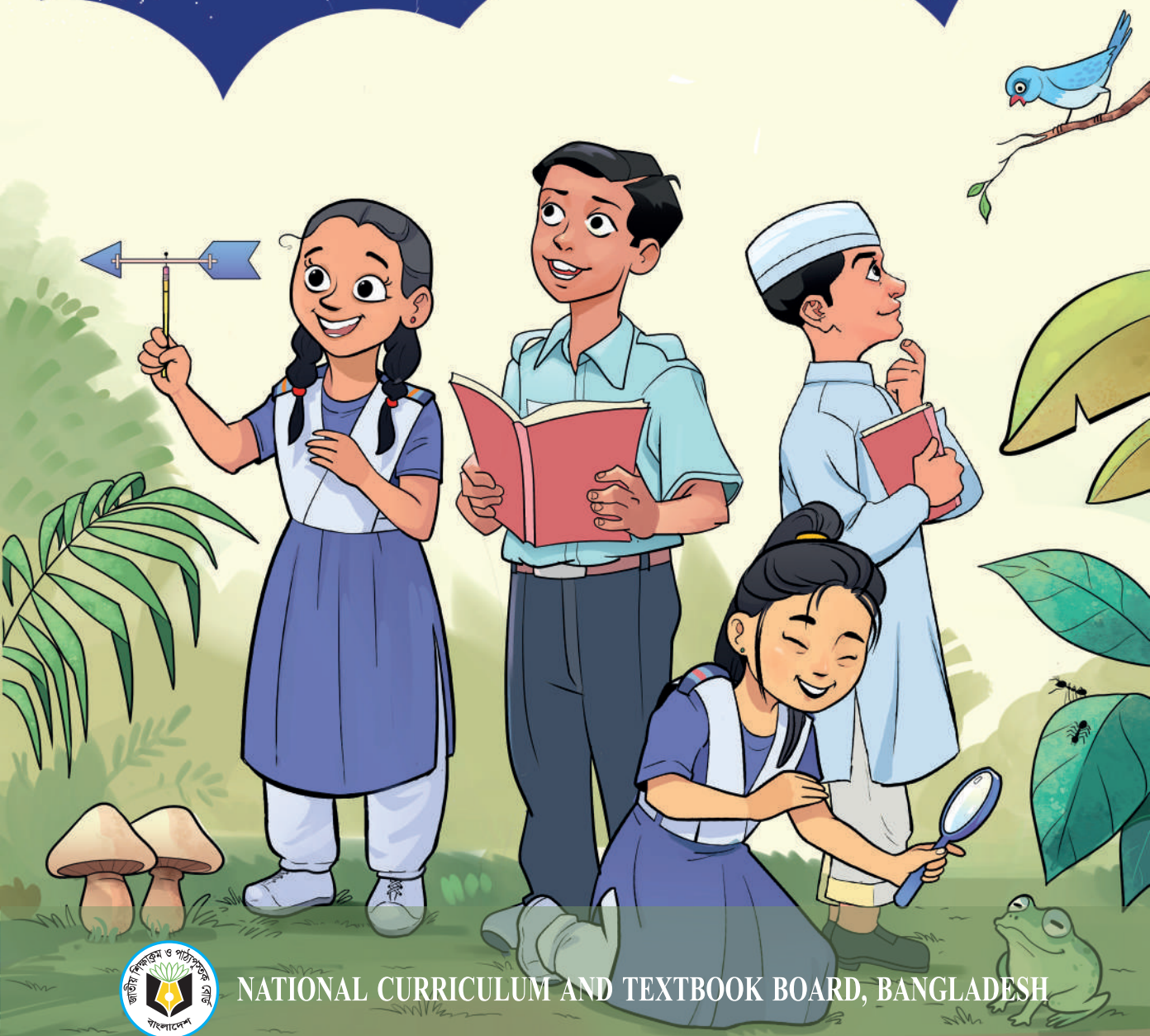
Science
Class Six

Exercise Book



NATIONAL CURRICULUM AND TEXTBOOK BOARD, BANGLADESH

জলবায়ু পরিবর্তনের বিরূপ প্রভাব মোকাবেলায় বিচক্ষণ নেতৃত্বের স্বীকৃতি হিসেবে পাওয়া
জাতিসংঘের 'চ্যাম্পিয়ন্স অব দি আর্থ' পুরস্কার গ্রহণ করছেন প্রধানমন্ত্রী শেখ হাসিনা

জাতিসংঘের পরিবেশ বিষয়ক সর্বোচ্চ পুরস্কার 'চ্যাম্পিয়ন্স অব দি আর্থ' পদকে ভূষিত হন মাননীয় প্রধানমন্ত্রী শেখ হাসিনা। পরিবেশ আদালত আইন, পরিবেশ ও জীব-বৈচিত্র্য সংরক্ষণ ও উন্নয়নে সংবিধানে ১৮ক অনুচ্ছেদ সন্নিবেশ, বন্যপ্রাণী (সংরক্ষণ ও নিরাপত্তা) আইন, ইট প্রস্তুত ও ভাটা স্থাপন (নিয়ন্ত্রণ) আইন, বাংলাদেশ জীব-বৈচিত্র্য আইন প্রণয়ন এবং জলবায়ু পরিবর্তনজনিত তহবিল গঠন এমন বহু গুরুত্বপূর্ণ অবদানের স্বীকৃতি হিসেবে বাংলাদেশের প্রধানমন্ত্রীকে ২০১৫ সালের ২৭শে সেপ্টেম্বর আনুষ্ঠানিকভাবে এই পুরস্কার প্রদান করা হয়।

Developed by the National Curriculum and Textbook Board as a textbook according to the National Curriculum 2022 for Class Six from the academic year 2023

Science | Exercise Book

Class Six

(Experimental Version)

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Preface

In this ever-changing world, the concept of livelihood is altering every moment. The advancement of technology, in accordance with knowledge and skill, has accelerated the pace of change. There is no alternative to adapting to this fast changing world. The reason is, the development of technology is at its zenith compared to any time in the human history. In the fourth industrial revolution era, the advancement of artificial intelligence has brought a drastic change in our employment and lifestyles and this will make the relationship among people more and more intimate. Varied employment opportunities will be created in near future which we cannot even predict at this moment. We need to take preparation right now so that we can adapt ourselves to that upcoming future.

Although a huge economic development has taken place throughout the world, the problems of climate change, air pollution, migrations and ethnic violence have become much more intense than before. The epidemic like COVID 19 has appeared and obstructed the normal lifestyle and economic growth of the world. Different challenges and opportunities have been added to our daily life.

Standing on the verge of these challenges and possibilities, implementation of sustainable and effective solutions is required for the transformation of our large population into a resource. It entails global citizens with knowledge, skill, values, vision, positive attitude, sensitivity, capability to adapt, humanity and patriotism. Amidst all these, Bangladesh has graduated into a developing nation from the underdeveloped periphery and is continuously trying to achieve the desired goals in order to become a developed country by 2041. Education is one of the pivotal instruments to attain the goals and there is no alternative to the modernization of our education system. Developing an effective and updated curriculum has become crucial for this modernization.

Developing and revising the curriculum is a regular and vital activity of National Curriculum and Textbook Board. The last revision of the curriculum was done in 2012. Since then, a lot of time has passed. The necessity of curriculum revision and development has emerged. For this purpose, various research and technical exercises were conducted under the supervision of NCTB during the year 2017 to 2019 to analyze the prevalent situation of education and assess the learning needs. Based on the researches and technical exercises, a competency-based incessant curriculum from K-12 has been developed to create a competent generation to survive in the new world situation.

In the light of the competency based curriculum, the textbooks have been prepared for all streams (General, Madrasah and Vocational) of learners for class six. The authentic experience driven contents of this textbook were developed in such a way that teaching learning becomes comprehensible and full of merriment. This will connect textbooks with various life related phenomenon and events that are constantly taking place around us. This is to be mentioned here that this textbook has already been refined through a logical evaluation by the writers and the subject specialists after collecting opinion from the teachers and students via an interim tryout. We hope that learning will be profound and life-long now.

Issues like gender, ethnicity, religion, caste, the disadvantaged and students with special needs have been taken into special consideration while developing the textbook. I would like to thank all who have put their best efforts in writing, editing, illustrating and publishing the textbook.

If any one finds any errors or inconsistencies in this experimental version and has any suggestions for improving its quality, we kindly ask them to let us know.

Professor Md. Farhadul Islam
Chairman
National Curriculum and Textbook Board, Bangladesh

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To the student-

Dear students, you have been studying science in all the classes. How do you feel learning science? We are sure you enjoy doing scientific practical tasks more than reading. From now on, we will not only read science. Rather we will have some experiences that reflect the way scientists originally do their researches. Certainly you have got the textbook which is directional or reference for you. Whenever you need throughout the year, you may consult this book. And the teacher is always there to help you.

This Book is Yours!!

This book is yours only; it is the book to jot down your tidbits of science, some sudden bright ideas and thoughts etc. All through the year, this book is going to help you like a friend!

Therefore, let us complete the introduction part right at the beginning, shall we? Write your name and ID in the blank space below:

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We should also strengthen our relationship a bit more, shouldn't we?

Write a few sentences informing the book more about you—

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Introduction

Many events continue to occur around us all the time. Certainly you have many questions about these, like why do these happen, how do they happen, etc. Some of you might have tried to seek answers to these on your own.

Now we altogether will seek answers to many such questions. This is your exercise book to make that work a little more organized. How to go through the various learning experiences step by step is given here in detail. While doing these tasks, you may need to know various types of information and theories of science; new questions may arise in your mind. The book 'Investigative Study' on Science will help you find the answers to all these questions. Moreover, these two books will directly help you in different stages of achieving learning experiences throughout the year.

Your learning experiences in class six are given beside. Take a look at them.

What kind of experience shall we have?

Title of Learning Experience	What we shall do
How big is the sky?	Who does not feel good to see the sky? Where is the end of the huge sky that we see the moment we look up? This earth, sky, universe- where did they come from? We shall look for these answers.
Science and Technology in our lives	Science is certainly not a new subject to you. This time we shall work on what science is and what science works with. Besides, we shall also learn to know various technologies we use regularly from a new perspective.
The motion game	Who doesn't like to play! Many of you may have played in games competitions school, but what if you are to organize a game on your own? From fixing the date to organizing the game- if it can be done by sharing the whole task among you, then it is better! Let's see some of the familiar games from new angle in this event!
Insolation, water and rain	How is the weather today? Is it sunny or raining? Which weather do you like most? Is our weather same all through the year? Again, were the summers a hundred years ago the same hot? Will it be same in the future? Our tasks here will answer all these questions.
Laboratory in the kitchen!	We use thousands of different things in our daily work. Different things are needed for each of the works. For cooking, we need so many things! The very kitchen is like a huge science laboratory. Let us see how the kitchen can be used for scientific research!

Title of Learning Experience	What we shall do
Those Who Are Our Neighbours	Can you tell who our neighbours are? Don't you want to know them? Remember, these neighbours also include trees, birds, animals, insects etc besides the humans. We certainly want to learn about them. It's time we seek these neighbours out.
Let's make a boat!	Is anyone here who has never seen a boat? At least, you must have made paper boats to float them in the nearby drain on a rainy day. How about revising the process of making a boat? And, that too, a real boat that can float, shall we?
Jack of Many Trades	There are people of many classes and professions around us whom we have to depend on in various ways. In this learning experience, you will go to the workplace of different professionals to see how skillfully they perform their jobs! You can also learn these jobs, if you wish. If you notice carefully, you will see that they use many tools and equipment that we even use in our households. But have you ever thought about how these tools and equipment help us with our work? Let's start exploring.
The course of the moon and the sun	It is hard to find anyone who has not been overwhelmed by the moonlight on a full moon. Almost everyone has experienced a full moon or a new moon (Amabasya in Bangla), but have anyone of you ever seen a lunar or solar eclipse? From the ancient times, people have seen these strange phenomena; have searched for the reasons for them; have come up with various rational and irrational explanations; have been in danger due to misunderstandings. In this learning experience, you will get some acquaintance with the experience of the ancient people, but you will also search for the scientific explanation of these events yourselves.

Title of Learning Experience	What we shall do
Mechanism of body clock	The job of science is to look into everything, from the structure of the vast universe to how a tiny wristwatch informs the time by ticking, and we have no end of questions. But have we ever wondered how the machine called our body works? Let us turn our eyes a little and try to understand this strange machine called human body!
Lives all over the world	How do you like to read story books or watch dramas? What if characters in the drama are something other than human beings? What if the story is your own? Let's see.
The world of colour	As we open our eyes, we see the show of countless colours in this colourful world! But why do we see red rose as red, and why the green leaves are green? Again, why don't we see the colour in ordinary water, glass or air? Have you ever thought about that? This time your job is to solve all the mysteries of the colours of this colourful world!

How Big is the Sky?

Who does not feel good to see the sky? Where is the end of the huge sky that we see the moment we look up? How big is this sky? Where did this earth, sky, universe come from? We shall look for the answers to these questions.

What are the questions that arise in your mind as you look up at the sky? Write them down here. Once the task is complete, check answers to which of them you could find out.

Session One

Let's start by looking overhead at the sky. What do we find in the sky? Quickly fill in the list below:

What we see in the daytime sky?	What we see in the nighttime sky?
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.....	.....
.....	.....
.....	.....
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Is the colour of the sky at dawn and afternoon same? What about the colour of evening sky? Does the sky change its colour so many times as it does in the morning, noon and afternoon? Which sky of a specific hour of day or night do you like most? Share your answers with your friend. Which sky does he like most? Try if you can draw the sky of your liking. If you want, you may also cut papers and paste on a poster paper!

Let's draw!

Image: Draw the sky (your friends view

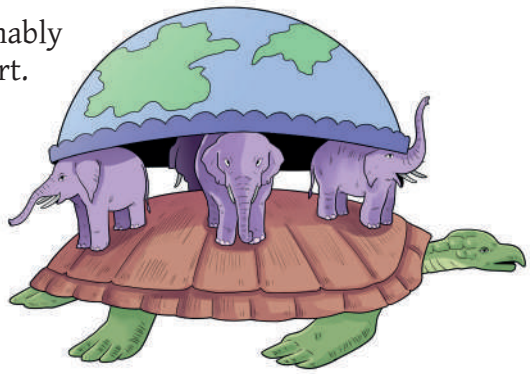
- When you finish your drawing, show it to your friends and see if they like it. Also, take a look at what other classmates have drawn. Ask other classmates if they can guess the time of day in your drawing!
- Once you return home, check the nighttime sky more carefully. There are hundreds of stars in the sky. Are they the same? Do they have the same colour? Do all of them twinkle?

Session Two

- You have certainly seen last night that all stars in the sky are not similar. All of them do not twinkle in the same fashion. Even, all of them do not have the same colour; some are white, some yellowish while some are a little bit reddish.
- Share the result of your observation with your friends. Do they agree with you?
- If your friends observed the sky with the same care, then you have certainly come to agree on some points. The tiny bright dots we see in the night sky that we call 'Stars' are not similar. They are not even 'Stars'. Stars are only those that appear to twinkle in the sky. Besides, we see planets and satellites in the sky which appear to shine steadily.

- Stars have their own light. That is why, sun is also a star. Many of us know about the solar system that centers round the sun. But there are millions of stars like our sun in the universe. We can see only a few of them with bare eyes. Again, these stars remain together in groups known as ‘Galaxy’. The name of our galaxy is ‘Milkyway’.

- All these things including this unimaginably huge universe certainly had a start. Long ago, people wondered how it all began. They made up stories that were passed down by talking to each other. For example, some thought the whole universe was on the backs of four huge elephants, and those elephants were standing on the back of a giant tortoise.



- This is what ancient people believed. But apart from the mythology, since ancient times, astronomers tried to understand how the universe began or how its structure was. They looked at the sky and came up with different ideas about the universe's structure and put arguments in favor of them. Over time, some of these theories became stronger with evidence, but others were lost due to lack of logic or proof. Something important to mention is that due to advances in science and technology, people now have the chance to learn about many more galaxies, stars, and planets beyond our solar system. In the past, this wasn't possible. Humans now use powerful telescopes sent into

space to observe the universe, which was not possible a hundred years ago. As a result, the only way people learned about the universe was by watching the movements of planets and stars in the sky.

Sit and read together with a friend what is written about the evolution of the concept of the universe (2.1) section of the second chapter in your Investigative Study book. After reading, answer these questions together-

* What did people think about the universe's structure in the past?

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* How did the heliocentric model come?

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* What were the arguments for the evolution from the geocentric model to the heliocentric model?

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Talk about your answers with a friend sitting beside you, and then share them with the whole class.

Session Three

In this session let's take a look at our own solar system. Do you know how many planets are there in our solar system? Do you all know their sizes, whether there is air or water on them, and how far they are from the sun? Apart from the stars you see shining and fading in the night sky, you must have seen various planets and satellites that are fixed points of light. Can you tell us which planets we can see from Earth?

Let's explore more about the solar system using the Investigative Study book. Read the 'Solar System' section (2.2) carefully with a friend sitting beside you. You can read and discuss it together.

Now, let's arrange a quiz that everyone can enjoy together. Here's an idea on how to create and conduct the quiz. You have the freedom to organize it in any way you prefer.

Divide the class into four groups. Each group will read the solar system section and create flashcards using the information they find. Each flashcard will have one or more information about a planet-satellite. Other groups will listen to the information and say which planet-satellite it is! Here is an example of a flashcard and some questions to ask.

Image: Our solar system

- I am the hottest planet in the solar system. Who am I?
- I am a gas monster. I have four satellites. Who am I?

If you want, you can design the flashcard or draw pictures on it as you wish.

- You can use different types of cardboard for this activity, like mountboard, color paper, or calendar paper. You can also reuse any wastepaper for this purpose.
- Each group should make 10 flashcards. Then, under the guidance of the teacher, you will start playing. The first group will ask questions to the third group, and the third group to the first group. The second group will ask questions to the fourth group, and the fourth group to the second group.
- But the condition is that if one person from a group answers a question, s/he can't answer another question. S/he will not be allowed to help others with the answer. That is, everyone from the group must take part in the quiz.
- The fun game has ended, and now we have another exciting activity to do. How about creating an Identity Board that includes all the planets of the solar system?
- Divide the class into 8 groups. Decide by lottery which team will create the identity poster or card for which planet.
- Each group should mention the following information about their assigned planet.
    - How big/small compared to the earth?
    - How far from the sun?
    - How is the temperature of the planet?
    - Whether there are moons or satellites, if so how many?
    - How is the structure? (Solid/Liquid/Gaseous)
    - Whether there is an atmosphere?
    - How many hours is the length of the day?
    - How long does it take to orbit the sun? That is, how less/more is the length of the year than the Earth?
- It will be helpful if you gather all the things you need for the next session ahead of time. It would be best if you could create this identity board by using old items that you no longer need, like cartoon paper, colourful wrapping, cloth, and round objects.

Session Four

- Now, it's time to create identity boards for the planets in our solar system. In the last session, you already planned how to do the work and what materials

you need. So, do not waste time in this session and get to work right away.

- Make a board titled 'Planets of the Solar System' (you can choose another name if you like) and place it in any corner of the wall (you can also use a large piece of paper). This board will contain different information about the size, structure, number of satellites, solar years of each planet compared to the Earth. To make this task easier, read the 'Solar System' section from the Investigative Study book again and fill out the table below.

Name of the plante	How many times larger or smaller than the Earth?	How is the structure?	How is the temperature of the planet?	How far is it from the sun?	How many satellites?	Whether there is an atmosphere?	How many hours is the length of the day?	What is the length of the year?

- After you have finished reading, use the information from the chart and work with your group friends to make your planet's identity poster or card. Put a big piece of paper or board on one of the classroom walls. Let all the groups display their posters or cards on the board or paper. Your identity board of the solar system is now complete!
- Take a look at the cards made by others. Then, compare the chart above and check if there are any differences in the information about the planets provided by everyone. If you have any questions, you can ask specific group members for clarification.

Home Task

- Observe the sky again tonight and try to find the star formation like the two pictures below.

Session Five

Did you find the picture of the star arrangement that was given yesterday? Who else in the class found out? Discuss with others what they say?

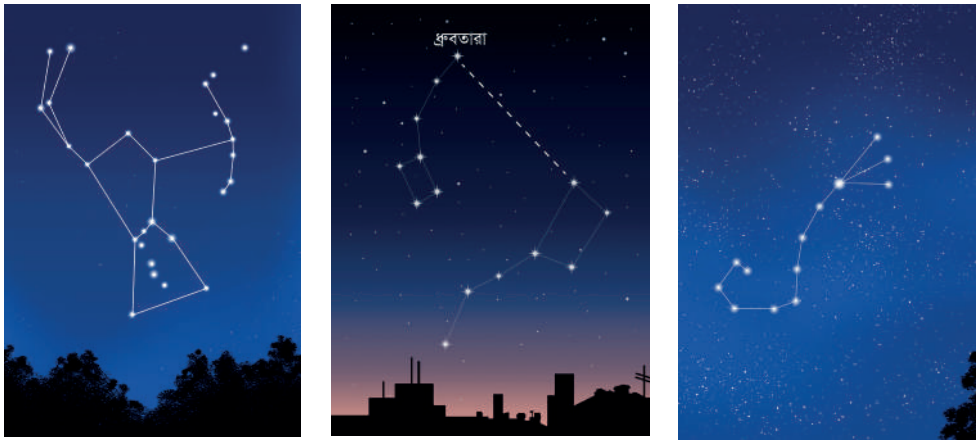


Fig: (From left to right) Orion, Ursa Major (the Great Bear) and Scorpio

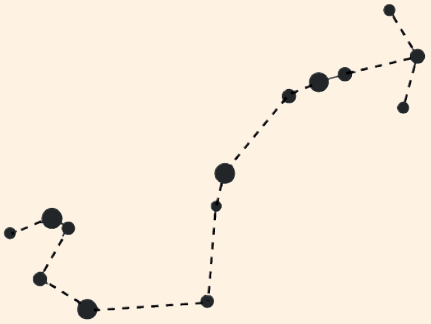
You already know about the solar system centering on the sun. But apart from the sun, there are billions of stars in the universe, and we can only see a few of them with the naked eye. Have you ever noticed that many pictures are hidden among the stars in the sky? Ancient people imagined various images from the arrangement of stars and created many myths based on these imaginary shapes. Your investigative Study book has several of these pictures. Take a look at them!

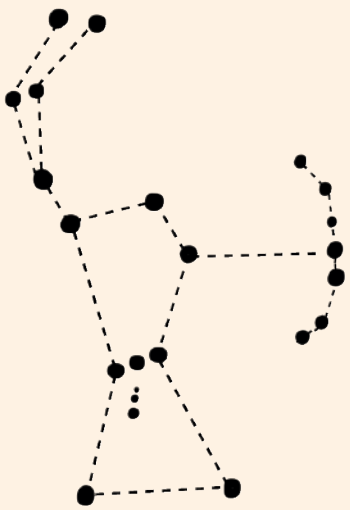
The three pictures shown above are connected to some fascinating stories from ancient mythology. Can you imagine such a picture?

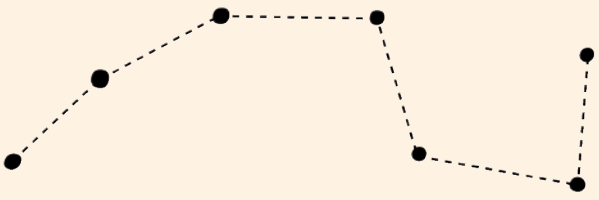
Orion in the Greek Myth

"Orion was a famous warrior and hunter! He was arrogantly proud! He used to claim that he could hunt all animals! The gods became angry at such arrogance in him! They sent a Scorpio to teach him a good lesson! A bite from that Scorpio killed Orion! The gods decided to place both Orion and the Scorpio in the sky as example for the humans. When the humans see them in the night sky, they learn the result of such arrogance! That is why, still, the Scorpio is still seen in the sky running after Orion!"

You and your classmates try to make pictures and stories from these arrangements of stars.

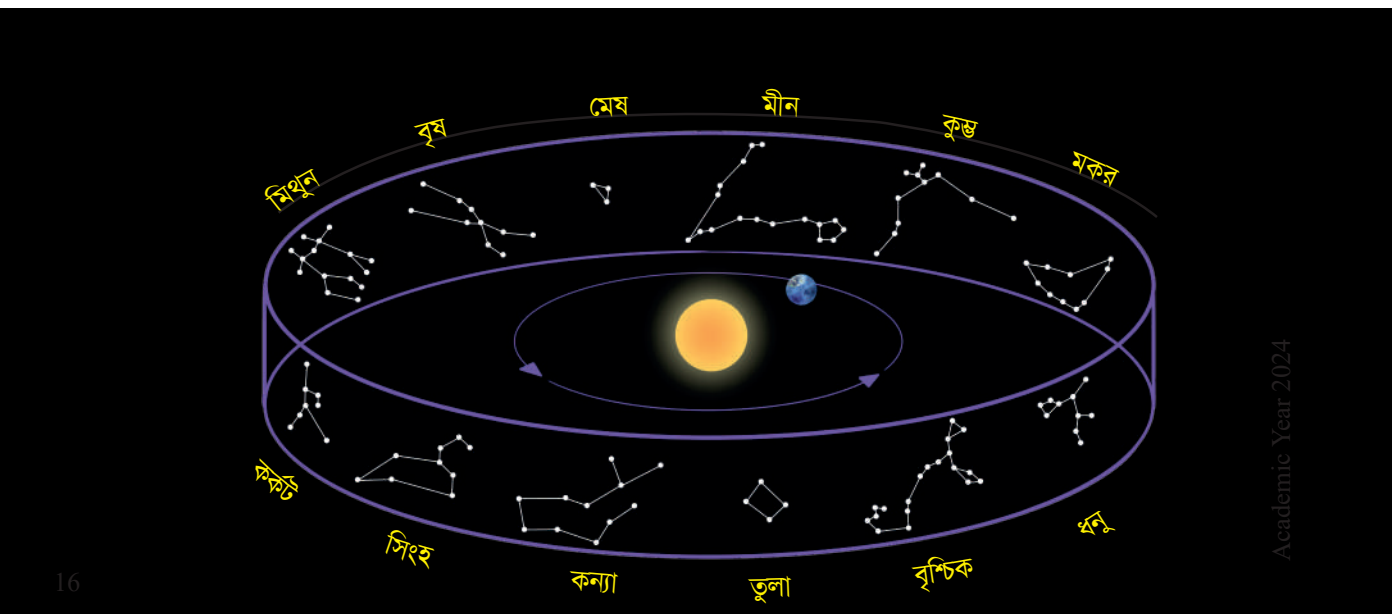






Match your image and story self with those of the others. Show them to your teacher too.

- The fact that so many stars in the sky together create a picture or a story in the eyes of our imagination, are all of them neighbours? No, they are not. Some of these stars are very far from Earth, some are closer. But even the nearest star is so far from Earth that we see each of them as a single dot of light. It is not at all possible for us to understand the distance between them with our naked eyes.
- We all know that the earth revolves around the sun, and it takes a year for the sun to revolve around it. Since the earth is not in the same place all year round, we do not see the same constellations in the sky all year round.
- If you do not believe, find the Orion in the sky in the summer!
- Ancient astronomers divided the sky into twelve parts based on the constellations seen in the sky at different times of the year. They named each part a zodiac sign. The cycle which is completed by turning around all these parts once was named the zodiac.
- The idea of these twelve divisions of the sky is very ancient. People have used it for various purposes in different times of civilization. There are two types of usage in your book; Bangla Barsapanji or calendar, and astrology or fortune telling. Sit with your friends in group and discuss these two issues, and keep the following questions in mind.
- Once you agree, write the answers on the table in the next page. If you do not agree, write it down as well!



Doesn't it look like a painter's brush work? This is a real picture of a nebula far away from the earth! What a wonderful thing, isn't it?

	Bangla Barsapanji or calendar	Astrology or fortune telling
How did it come?		
Why is it used?		
Is there a scientific basis?		

Session Six

Have you identified any unscientific practice or superstition from the previous day's discussion? Have you ever seen someone in your family or neighbourhood who believes in such superstitions? What should be your responsibility in these cases? Discuss with friends and decide and write it on the table in the next page. Share the group opinions with others including the teacher in the class, to see if other groups agree with you.

Common unscientific practices or superstitions		
Specific events or evidence where you have seen precedents for this practice		
What is the reasoning behind thinking it unscientific or superstitious?		
What should be your responsibility?		

- ‘We’ve talked, thought, and learned a lot about “How big the sky is”. The work of looking at the sky with paper and pen is over this time, but there is no obstacle for you to see the sky!
- Before you finish, write down your thoughts in the table below. Think about the questions on the left and put your answers on the right

Looking at the sky, what new things are coming to mind now, or what new thoughts are coming to mind?	
What other questions are revolving around in your mind?	

Surely many of your questions are yet to be answered? You will find those answers one day, maybe in one of the higher classes. Even if not in the higher classes, you can find answers to many questions on your own; Now you all know how to find the answer to a question through scientific inquiry! There are thousands of books in the world beside schoolbooks!

Science and Technology in Our Lives

The subject, Science is certainly not new to you! What is science or what science works with this is our work this time! At the same time, we may learn to look at the technology we use in our daily life with new eyes.

Academic Year 2024

Sessions One and Two

In previous learning experiences, you must have got some idea of how science works. You already know that there must be enough evidence to support what science says, and that a theory can also change on the basis of evidence. In this new learning experience, we will try to look more closely at science, scientists, the process of scientific inquiry and technology.

We all read science in school investigative study book, but have you ever wanted to know how the real scientists work? Well, have you ever seen a real scientist with your own eyes? How do scientists look?

Let us draw the scientist of each of our imagination-

Image: The scientist in my eyes

See how the drawing of the friend on the next bench is. How has the rest of the class drawn? What are the features of the appearance or clothing of the scientists mostly seen in the paintings drawn by everyone?

Now read from the investigative study book what is written in the first part of the first chapter about the concept of science, the example of Madame Curie, Isaac Newton and Haripada Kapali. Do you find any similarity between your reading and the image of the scientist in your own imagination? Discuss with the classmate next to you and match your idea!

Now write the answers to the following questions quickly based on the discussion!

What are the characteristics found in true scientists? Can anyone become a scientist if he wants to?	
Does scientific research or inquiry always need a lot of modern laboratories or equipment?	

Now go back to the discussion. Scientists do inquiry or research in order to find the answer to a question or to solve a problem. Now, do you have to be a professional scientist to do this inquiry? Or can you also do scientific inquiry to solve a problem in the same way? You have read the story of the discovery of two scientists; now take a closer look at the process of their research again! Do you see any similarity in the working processes of the two scientists? Write down your thoughts by talking to a friend next to you-

What are the similarities between the scientific research processes of Sir Isaac Newton and Haripada Kapali?	

Before going further into the discussion of scientific investigation, let us know an incident. The incident is about falling objects – if a light and a heavy object

are let loose from above, which one will fall first? Leave a piece of paper and a pen and see for yourself first?

What happened? Tick the answer below.

- ☐ The piece of paper fell first.
- ☐ The pen fell first.
- ☐ Two objects fell simultaneously.

Now read the section on scientific investigation from your Investigative Study book. Read the detailed description of how the formula of falling objects came about and discuss with your friends to see who thinks what.

Now write the answers to the following questions,

What is the formula of falling objects? Think about what your previous test results were! Does your own experience match the formula?

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How did the formula of falling objects come? Do you agree with this formula? Justify your decision.

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You have come to know about Galileo's experiments. To conduct such a scientific investigation, there are several steps to be followed. Read the steps from the Investigative Study book. Discuss with friends and teacher. Read

the story of Haripada Kapali's discovery again and see how he followed these steps in discovering his new variety of rice! Below are the steps of scientific inquiry. Discuss with your classmates what scientist Haripada Kapali has done at specific steps. Write your opinion in the blank space next to the steps-

Steps of scientific inquiry	What scientist Haripada Kapali has done in this step-
(1) To fix a problem or question which needs to be solved or answered	
(2) To know what research has been done in this regard	
(3) To make a possible explanation of the question	
(4) To check whether the possible explanation is true	
(5) To take a decision by analyzing the test results	
(6) To share the idea with others	

Session Three

- The previous day, there was a lot of discussion about how science works; we also saw that science helps us find answers to many questions. But have you ever wondered how science can be directly applied to our lives?
- Can you think of some examples of how we can make our daily lives easier by applying the knowledge of science?
- Write down immediately whatever comes to mind in the chart below!

In which areas of life do we directly meet our needs by applying the knowledge of science?

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- When the knowledge of science is used to meet one of the needs of our life, it is called technology. In the chart above you must have highlighted some of the technology! Even then, has something very common/conventional escaped your eyes? To understand this, compare the list above with a friend next to you. What is the similarity between the two lists? If there is any, what are they? Choose a technology that is on the list of the two of you, or that both of you are very interested to know.
- Now it is the responsibility of both of you to find out what is the role of science behind the technology that you have chosen. That is, what special knowledge of science is involved in this, how science has been applied in this case. Discuss among you, and note down the results of the discussion below-

Our favourite technology	
Knowledge of which field of science has been used here?	

The rest of the class must have written about their favourite technology! Talk to everyone and see if you can find out about any new technology!

Home Task

You have to do something before the next day's session. The following is a list to be made by you about the most common technologies used by family members, relatives, and friends in your home. As well as not forgetting to note what they use this technology! Also, don't forget to note down, for what they use this technology!

The name of the technology	What is it used for?
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Session Four

The previous day, your friends must have written a lot about different types of technology. First, divide into small groups and listen to everyone else. Also, share with others what you got!

Much work has been done on the use of technology in various aspects of daily life. But is technology just related with our daily lives, or does it have uses in other fields? Now let us work in a group to find out different aspects of science! Let us also find out what other examples of application of technology in other fields other than various aspects of daily life!

If you know of any new technology in the group discussion, write it down in the table below-

The name of the technology	What is it used for?
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Make a list of all the information you have gathered and of all types of technology that have come up from the discussion with the rest of the group. Now take a closer look, among all these discussed technologies, which ones we really need? Which ones are totally unnecessary? Again, do people use all technologies for good works? We see a lot of technology being used for bad purposes! Again, there are many technologies that can be used for both good and bad purposes!

Discuss all the technologies and their uses that have come up in your group list, and see which ones fall into which category! You can take the help of your investigative study book in this regard; read the technology part of the first chapter. Then, based on everyone's opinion, categorize the technologies in your list according to the table on the next page-

The name of the technology	Different uses of the technology	The results of using the technology are getting better or worse	Why are we saying good or bad?

As you can see, just as different technologies have made life much easier, so has the risk of misuse. Just think if we have anything to do with this! Going back home today, get the opinion of others in your home, and discuss with the rest of the group in the next session!

Session Five

After the previous session, sitting in your home, you must have thought a lot about the various uses of technology, and what we have to do in those cases! Now talk to the rest of the group and see what the rest of you think!

It will not be enough for you to ensure the use of technology yourself; you have to make others aware! You must have got a lot of good ideas about how to do that by discussing in the group! Note down the ideas based on your group discussions-

What can we do to increase the use of technology for good purposes?	What do we have to do to reduce the unnecessary use of technology, or the misuse of technology?
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Now share your ideas with the rest of the class and see what others feel! In order to share with others, you can use posters, or draw pictures or any other way!

Everyone in your class is now very aware of the use of technology, but many students in other classes of your school may not know these things or have never noticed! Is there anything you can do about it? Discuss with everyone

in the class. If you want, you can arrange cartoon or poster exhibition, a seminar or discussion program etc.

Has everything gone according to plan? In doing so, has any new direction come to mind that you never thought before? Note down your feelings!

Retrospection

What was the plan of your group?

How was your experience in doing the job? What have you learnt or known?

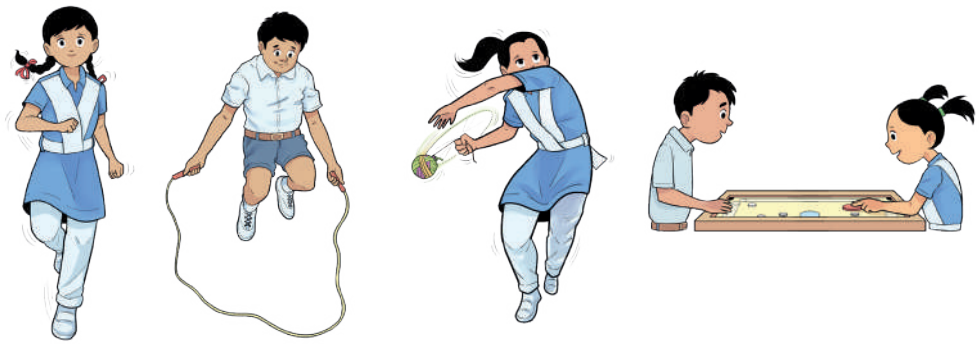
Is there any question about science and technology in your mind that has not yet been answered? Write your question below, so that it is not lost! You will surely find the answer to these questions yourself anytime later!

The Motion Game

Who doesn't like to play! Many of you may have played in games competitions school, but what if you are to organize a game on your own? From fixing the date to organizing the game- if it can be done by sharing the whole task among you, then it is better! Let's see some of the familiar games from new angle in this event!

Sessions One, Two and Three

- In this learning experience, your whole class will organize a game. It's better to have a holiday to play, right? But if that is not possible, these tasks can be done in the science period of a few consecutive days.
- With the help of the teacher, see if you can find a small plain place in the school premises or in an open space.
- First, it's time for team distribution. Divide yourselves into teams with the help of the teacher. Each member of each team can participate in one game. There will be a team of at least 4 members for each of 4 games. Everyone in the team can discuss and decide who will participate in which game; in fact, everyone does not like to play the same game. More than one member of a team cannot participate in the same game. Here it should be remembered that the final result will be determined by the score of all the members of a team.



- Note the name of your team member participating in each game in the chart below, so that you don't forget later.

Table-1

Team:				
Name of the member	Name of the game (tick the event a member will participate)			
	Race	Rope jump	Weight throw	Carrom

After the team distribution, it is time to organize the game. Through a discussion among you including the teacher, decide what will be the sequence of the games, what are the rules of the games, what works need to be done, etc. Also, everything necessary to organize the games should be gathered. Each team will be responsible for organizing any one of the games. This responsibility will be distributed by lottery. Write down which team is responsible for which game in the table below.

Table-2

Name of the Game	Which team will be responsible to organize

Now prepare the playground together to make it suitable for playing and do whatever is necessary, such as cleaning the field, leveling it, marking it with quick lime for playing, etc. As the saying goes, "We stand or fall together".

It will take quite a few more materials to organize the game, won't it? For example, quick lime or something to mark the field, measuring tape, rope, tennis ball, stop watch or clock, carrom board, disks and boric powder etc. Can you think how you would collect them? If you want, you can take the help of the teacher.

Then, with the help of the teacher, measure 100 metres from one end of the field to the other (If you do not get a whole 100 metre long area altogether, try to measure the maximum length you get) and mark it where the race will take place. Choose a plain place for rope jump. For weight throwing game, mark the spot from where it will be thrown and also mark the distance that you have to run by whirling the weight with quick lime. Carrom is best played if you find a shady spot on the side of the field where you can place a tool and raise the carom board or can also use your classroom bench-table for this purpose.

You know that all games have some rules. If you play without rules, there will be chaos. So, at the beginning everyone including the teacher should talk together and fix some rules according to which the games will be conducted.

The first event will be a race-

- The selected members from each team will stand at the starting line of the race.
- When the teacher blows the whistle, the race will start.
- The teacher will note the time taken by a competitor to cover 100 metres (or the distance fixed) using a stopwatch. The teams in charge of organizing the game will also note the timing by using a stopwatch. Note in the table below by verifying with the teacher's observations.

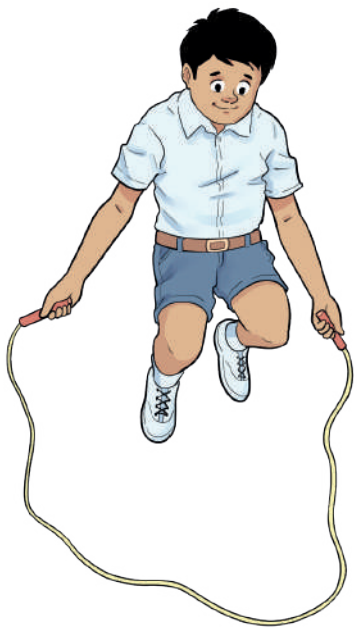
Table-3

Name of Competitor	Distance (m)	Time (s)	Position (Serial)

Name of Competitor	Distance (m)	Time (s)	Position (Serial)

Now it is the turn of rope jump-

- In this game, the participants will stand in a circle.
- As soon as the teacher blows the whistle, you will start playing. The winner is the one who can spin the rope over their heads and under their feet repeatedly for the longest time.



Those of you who were watching the game, notice - does the rope go and come repeatedly in circle from one side to the opposite side?

Count how many rounds the member of each team has completed, that is, how many rounds have been completed starting from behind, bringing forward and sending behind again. And keep record of how many rounds have been completed, how long it has been played until the rope is twisted. The teacher will help here keep track of timing with stopwatch. You will check the timing from the teacher later.

Write down in Table-4 below how long the competitor of your team could play the rope jump without twisting the rope with his/her feet.

Table-4

Name of competitor	Number of completed rounds	Duration of playing (s)	Number of rounds per second	Position (Serial)

On the other hand, the preparation for weight throwing is definitely over. Have

you ever seen what professional athletes use for weight throwing? Really heavy, right? Rather, this game can be played by putting tennis ball or rubber ball inside a cloth bag. But if you have any other idea, you can also consider them!

- Put the ball in a cloth bag and tie its mouth with a rope. Cut the rope in such a way that there is at least 1-2 feet of extra rope for holding it. Holding this rope, you have to throw it forward.
- The thrower will grab the rope, and while whirling it forward, he/she will step to the starting line and try to throw as far as possible. Whoever will be able to throw the ball the farthest is the winner.
- Those who are throwing the weight, notice-
  - ➲ How do you feel when the bag with the ball is attached to the rope?
  - ➲ While you are pulling the rope, is the ball trying to run forward?
- Write down how far your team's competitor's ball stopped in Table-5 below.

Table-5

Name of competitor	Distance (m)	Position (Serial)

- Draw a picture of how the thrown weight of your team's competitor went up and came down during the weight throwing in the space below

Why did the ball in your drawing curve downwards repeatedly instead of going straight? Note down your ideas below!

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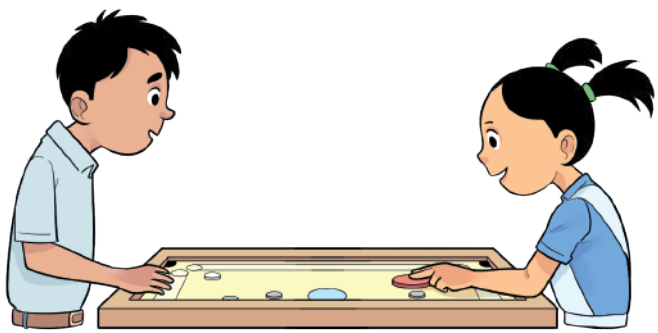
Now it's time to play carrom. You must have decided where to play carrom! The participating member of the team will be busy in the game, the job of the rest of the members is to keep an eye on the game as before. And if your team is in charge of managing the game, it's even more work!



Win-Loss will depend on the points against carrom disks. Ten points for pocketing a white disk; Five points for a black disk and 20 points for a red disk. However, just after pocketing the red disk, one has to pocket another disk in the next turn. Otherwise, the points of the red disk will not be added, and the red disk must be placed again in the middle.

During the game, everyone will notice carefully-

- How do the disks hit against each other and run back and forth?
- Does the path of a particular disk stay in a certain direction or does it change, if it does not collide with another disk on the way?
- How and in what direction does it change the path after collision?

Write the score of your team's competitor in Table-6.

Table-6

Member	White disk (10)	Black disk (5)	Red disk (20)	Total point	Position

Does the path of the striker change, after the striker collides with the carrom disk? Draw a picture below and show it! Then think and say- why is the direction of the motion of the disks changing?

Well, do you remember the boric powder that was applied to the carrom board? Why is boric powder used? What happens if it isn't used? Write your answer in the blank space below.

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It has been a lot of games! The winning team can be determined later by counting who won which game. Before that, how about a closer look at these games?

Home Task

The games in which you took part today were all about motion. Read the section on different types of motion from the investigative study book and see if you can find any similarity between these motion types and your games in Table-7 below! If you find a similarity, you can put a tick in the specific column.

Table-7

Name of Game	Rectilinear Motion	Curvilinear Motion	Rotatory Motion	Simple Harmonic Motion

Sessions Four and Five

Sitting at home, you have learned a little about different types of motion from your science book. Now sit and discuss with your friends and see what they think, whether they find any similarity with your games. Do you see any difference in your perceptions?

Now discuss with your peer in which cases these different types of motion below are found and write down in Table-8.

Table-8

Different types of motion	Example
Rectilinear motion	
Curvilinear motion	
Rotatory motion	
Simple harmonic motion	

You must have noticed that when the race was held, each one covered the distance at different timings. Some did very quickly, some a little slowly. That means everyone's motion was not the same. It was more or less.

Let's now learn how to measure motion. It is very easy to calculate. The distance covered by the competitors every 1 second is their respective velocity. That is, dividing the total distance by the time calculates the velocity.

From Table-3, calculate, in the blank space on the next page, the velocity of the race in which your team member took part.

- If this motion decreases or increases, what is it called in scientific terms? If you don't know, take a look at the book.
- Now let's come to another topic. Visualize again the experience of you and your friend after participating in the race. Could you stop just at the end of the race? Or you had to stop a few steps ahead?
- As you already know, an object does not change its motion, or bend its path, unless a force is applied. That's why if something is pushed, it continues to move in a straight line until it stops. Again, the object thrown upward rightly turns in the curve and comes down; one type of force is also responsible for this - the force of attraction of the earth towards itself. We call it the gravitational force. Objects at rest or objects in motion, everyone wants to stay the way they are. But is it really so? What is your own experience? Again, think about the carrom game experience!
- If you hit gently while playing carrom, doesn't the disk stop after proceeding a little further? Why does it happen? Does adding boric powder change the motion of the disks?
- Discuss among yourselves and verify what others feel. Now read the section on the concept of force and different types of force from your investigative study book. Do you find any similarity with your ideas? Discuss with friends.

Now let's discuss another issue. Have you noticed while playing carrom that the harder a disk hits another disk, the faster it bounces? What is the reason for this? That means the disk's motion is creating a kind of energy, the higher the motion, the more energy it creates. Similarly, can energy be stored in objects at rest?

Read the section on energy from your science book and discuss it with everyone in the group. Now think and answer a question. Suppose, a ball is falling from above. Will the ball fall faster if it falls from farther above? Or will it fall with the same force whatever the height it falls from? Answer the questions discussing among all. Do not forget to write the reasons for your answer!

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Now let's check if your guess is correct. This can be tested in many ways. If you drop a duster from a little above the table, then some sound will be heard. If you drop it from a little more height, will the sound be louder or softer? It will be easier to do the test in water. If a stone or pebble is dropped from a short distance from the water, will it fall faster than if it is dropped from a greater height? You can easily check it- you can understand clearly by looking at the water splash.

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- The game is done, from the game we learned about different types of motion. But one big task still remains, and that is to make the gift which everyone has to make together.
- It was decided earlier that you yourselves will make the prize for the winning team in this game. Prizes can be anything handmade. Such as greeting cards, paper flowers, birds or trophy (cup) models etc. You discuss and decide on your own what to make, then make them after class or bring from home.
- Now it's time to announce the winning team. The team that gets the highest score across all four sporting events is the winner. One thing to say quietly here - it is true that all other teams will hand over gifts to the winning team, but the winning team will also have to feed chocolate to everyone else! So, losing is not a bad thing, what do you say?

Insolation, Water, Rain

How is the weather today? Is it sunny or rainy? What kind of weather do you like the most? Is our weather the same all year round? Again, is it as hot now as it was a few hundred years ago? Will it always be like this in the future? This time it is our task to find the answers to these questions.

Academic Year 2024

Session One

- How is the weather today? What do we mean by this question? How about the sun, rain, wind, etc.? Morning, afternoon, evening, night - is it always the same weather? What time of day do you like the sky the most? As the colour of the sky changes at different times of the day, what other changes do we see throughout the day?
- Which is your favourite day- Extremely hot, rainy, or a bit cloudy day? Talk to your friends and see if it matches. If you want, you can also show the picture of your favourite day by drawing!

Let's do the work of the next week at home

- Let's take a look for a week at how our weather keeps changing at different times of the day!
- Notice the weather at different times of the day for the next one week and make a note in the table below. Getting out of the house at certain times of the day, observe the weather in the open environment. Write down the time of observation, comments about the concept of temperature, how the feeling of sun, the condition of the sky, the possibility of rain, etc.

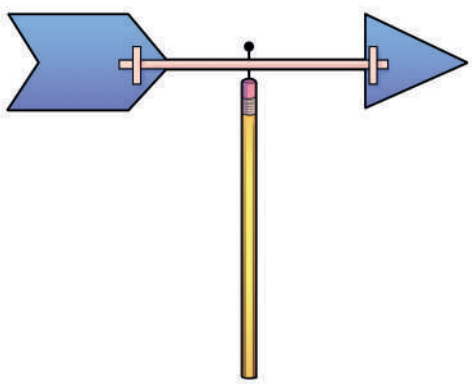
Date and Day	How we understand the weather, such as- colour of sky, sun, rain, heat, wind speed etc. Keep notes in the following times				
	Morning ----	Noon -----	Afternoon ----	Evening ----	Night ----

You must have heard the weather news on radio and television every day. Newspapers also have weather news. Collect information on weather for this week from radio bulletins, television news and magazines and note them in the table below-

Date and Day	Source of information Radio/ TV/ Newspaper information	Temperature	Humidity of air	Condition of sky	Possibility of Cyclone/ rainfall	Remarks

Sessions Two and Three

Keep notes of the weather, why don't we try to use this one week for other purposes! When looking for daily weather information from a magazine or TV, you will see some words every day, such as air temperature, air pressure, air humidity, amount of rainfall, direction of air flow, etc. We have heard these words, but can we understand the meaning of all of them? What is the way to measure these? In these three sessions, read these topics from the investigative study book and discuss in class. Take the help of the teacher. You can try to make a wind vane to experiment the direction of air flow in the class. Air pressure experiment can be done in class with very few materials. Details of these experiments are given in your investigative study book.



Sessions Four and Five

- Your friends must have done the above in the last one week! First of all, compare the above two tables and see what similarities the weather information taken from different media has with your own feelings! Now compare your information with your friends' information. How did they put notes in their tables?
- Take a closer look at the weather information of the last one week. How much difference do you see between the first day and the last day? Is the heat slowly increasing or decreasing? What about the amount of rainfall? Can you imagine what the weather will be like in the next one week if it continues like this? Discusses in groups and try to create a weather forecast for the next one week in groups by analysing the weather data of the previous one week or the previous two weeks with the help of the teacher. You can present your bulletin to the rest of the class in the same way that the weather bulletin is broadcast on TV. You can also make the presentation more interesting by using PowerPoint slides or hand-drawn posters!
- Make a note of the summary of the weather forecast made by your group in the table below-

Date and Day	Temperature	Humidity of air	Condition of sky	Possibility of Cyclone/ rainfall	Remarks

- Don't forget to check which group's weather forecast matched the most accurate weather at the end of the week!

Sessions Six, Seven and Eight

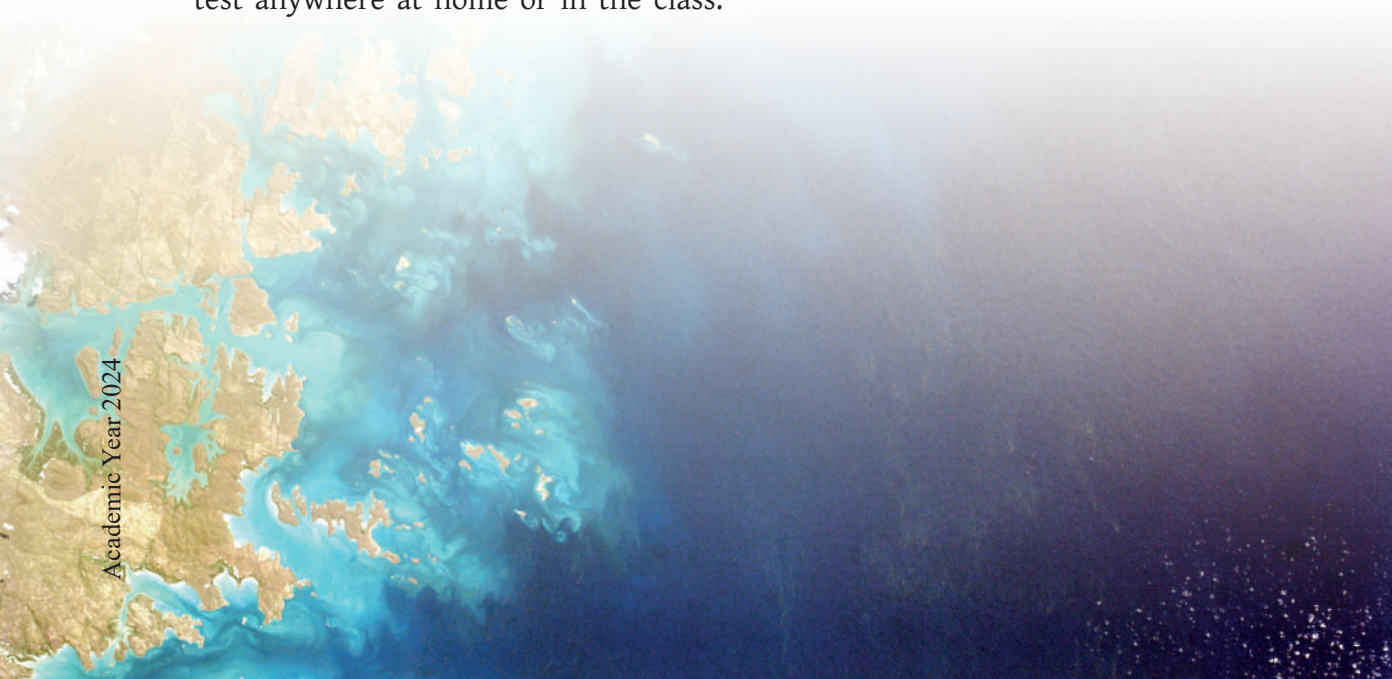
- While dealing with the weather, you must have understood one thing that the parameters by which we try to understand the weather change regularly. You have seen this change at different times of the day. Similarly, you have also noticed that the weather is not exactly the same at the same time every day. Even it is not the same hot or cold, not the same rainfall at all times of the year. However, we know in advance that it will be colder or rainier at which time of the year. That's why when the rainy season comes there is a rush to buy umbrellas starts. Again, before the winter comes, there is a rush to take down the blankets from the cupboards in the house and put them in the sun!
- We will discuss later why the weather is different in each of the seasons of the year. But it is clear that no matter how much we see the weather change at different times of the day or in different seasons of the year, there is a pattern of change. That is why we can predict the weather in advance and most of the time it also comes true!
- You have already known that all these elements of the weather (such as, air pressure, humidity, temperature, amount of rainfall, etc.) are the result of different interactions between the sun, the earth, and the atmosphere surrounding the earth. So, what does it mean? The changes we see in the normal eyes as a result of all these interactions also have a pattern. In other words, at a certain time of the year, the weather in a certain place is not exactly the same, but it is fairly close!
- From year to year we see the same season, and the same weather by turn. Is it always the same in the case of a long time? The table below shows the temperature of several countries of the world including Bangladesh after many years. Talk to your friends and see if there are any changes in the temperature of these countries over time. And do you find any similarities between these changes in different cities!

	Average temperature of five years on Celsius scale		
	At the beginning of the twentieth century	At the middle of the twentieth century	At the beginning of the twenty first century
Bangla-desh	25.01 degree	25.17 degree	25.72 degree
Maldives	27.63 degree	27.54 degree	27.85 degree
Iceland	1.22 degree	1.72 degree	2.28 degree

- Note down on the Table of next page what you have found after thinking.

Is the climate of these three countries changing over time?	
Can you find any match in the change?	

- Share the results of your discussions with others in the class. See what others are saying. Now read the climate part from your investigative study book and join the discussion again.
- You can see, the weather seems to be repeating itself every year in different seasons, but in fact, over a long period of time, climate (you must know that in this case we will say climate not weather) is changing all over the world, and there is enough evidence for that.
- A big indicator of climate change is the change in temperature. Why is the temperature changing? How does the atmosphere preserve heat? You need to do a little experiment to know the answer to this question. You can do this test anywhere at home or in the class.



Materials: Glass jar/ three glass bottles with lids, three thermometers (thermometer should be inserted into the glass jar or glass bottle).

Perform the following tasks serially for the experiment –

- Clean three glass jars, keep them in an open place in the sun and measure the air temperature inside the jars with a thermometer (If necessary, you can see the process of measuring temperature from the investigative study book). Then note below the air temperature inside the three jars.

	Temperature
First jar	
Second jar	
Third jar	

- You must have got nearly the same temperature in three jars! Put the thermometers inside the jars.
- Now keep the mouth of the first jar open and close the mouths of the other two jars. Put a piece of wet cloth or tissue in the third jar before closing it.
- Leave all three jars in the sun for half an hour. After half an hour, record the temperature of the thermometer inside the three jars in the table below.

	Temperature after half an hour
First jar	
Second jar	
Third jar	

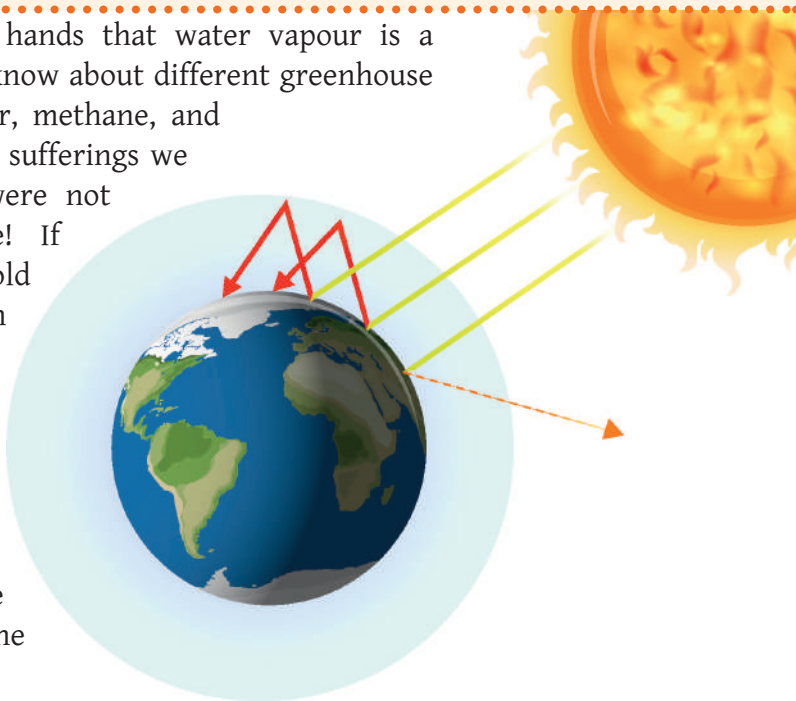
- Do you see any change in the temperature of the three jars? Why do you think change is happening? Discuss this with your friend and write your opinion below-

	Temperature after half an hour	If there is a change, what is the reason?
First jar		
Second jar		
Third jar		

➲ Now together you two friends read the part of the greenhouse effect from the investigative study book. Now take part in the discussion with the teacher and everyone else in the class. Do you find any similarity between this incident and the result of your experiment?

If the temperature in the jar with closed mouth is higher, you must have understood why it is higher! Well, did you find any difference in temperature between the second and third jars? What is the reason for this? Talk to the rest of the class, including the teacher.

You have evidence in your hands that water vapour is a kind of greenhouse gas! You know about different greenhouse gases, including water vapour, methane, and carbon dioxide. Imagine what sufferings we would face if those gases were not present in the atmosphere! If the atmosphere could not hold the heat, we would die from shivering cold in winter! Why only us, all the numerous creatures around us that you know would all face the same condition! And carbon dioxide is our most helpful friend, carbon dioxide is one of the main elements of the food that plants make!



Now think of the third jar a little differently. If we continue to increase greenhouse gases in the Earth's atmosphere instead of the glass jar, what kind of climate change will happen? Think, what are the activities of the people around you that increase greenhouse gases? On the way to and from school and home, observe the behaviour of others. Then keep a note of it in the space below. Listen to what others think in the next session!

What are we doing that increases the amount of greenhouse gases in the air?	What is the relationship between this work and the increase in greenhouse gases?
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Home Task

In addition to the greenhouse effect, there are other causes of climate change. One of them is acid rain. When acid is mixed with water vapor in the air, it falls to the earth with rain. You may be wondering, what else is this? If the acid in the rain was harmful, we would all burn. We can see the effect for ourselves through a small work!

- Take two tree leaves at home. Put a few drops of water on the first leaf and a few drops of acid on the second leaf. Wondering where to get acid? Vinegar is used in cooking in almost all our homes, but it is also a kind of acid! If you can't find anything else, you can also use lemon juice. Lemon juice also contains a type of acid called citric acid.
- Take a good look at the two leaves after a few hours or a day. Do you see any change? Make below a note of what you see or draw a picture of what the leaf looks like.

Condition a few hours after giving the water drop	Condition a few hours after giving the drop of acid / vinegar / lemon juice

Session Nine

At the beginning of this session, discuss the experiment you did at home the previous day. Share with the friend beside you what changes you have seen in the leaves of the tree due to the acid. Share it with the rest of the class. Are all the results fairly similar?

Read the acid rain part from the investigative study book together with your friend beside you. Discuss with the teacher and others why acid rain occurs. You've already seen a small sample of the results of acid rain. You can imagine the impact on the biodiversity, including plants, if it happens for a long time. Take a look at the effects of this rain over a long period of time. Do you have anything to do with this? Think about it!

As mentioned in the previous session, you and your friends must have gathered enough information about our roles in increasing greenhouse gases! Now divide into a group and discuss what the rest of the thinks. Collect all the information and check all the reasons. Now identify the five most important factors that we can easily remedy if we want. Or even if we can't always do it ourselves, we can at least explain it to others so that everyone changes their behaviour from their own side. Everyone can come up with a plan, then write down your thoughts.

Five of our works that increase Greenhouse gases	How can this be solved?

It will not do, if you just plan and sit idle, rather you have to do the tasks. Before that, share your plans with other groups in the class. Get everyone's opinion, maybe some great ideas from other people's opinions can be added to your plan!

When all the group's plans have been shared, fix a time to implement the tasks. This time can be from 15 days to a month. Don't forget to share with others what your realisation is after implementation!

Has everything gone according to plan? Note down your feelings below!

What was the plan of your group? How was your experience implementing the plan?

Have you faced any challenge? What initiatives has your group taken to address the challenge?

Have you noticed anything else that disturbs the balance of the climate? What do you think can be done to solve this?

Laboratory in the Kitchen!

We use thousands of different things in our daily works. Different types of things are needed for each of the works. Say for cooking, we need so many things! The very kitchen is like a huge science laboratory. Do you have any prior experience of cooking? If you don't have, no problem. You will arrange a small picnic in the very beginning of this learning experience. This will make you learn a bit of cooking.

Let's now see how a about using the kitchen in scientific experiment!

Session One

- In this learning experience, the kitchen at your home will be your science laboratory. However, how about organizing a picnic before starting all the complicated experiments in the kitchen? The condition is that you yourselves have to do all the arrangements for the picnic!

- Picnic means everyone cooking, eating and drinking together, right? First of all, we need to know everyone's favourite food. Write down your favourite food at once! After writing, compare it with your friend beside you and see if you have any common preference of food!

- Everyone in the class must have written down their favourite food! Check, which of these can be on your picnic menu? If you want, you can also think of any other food item. With the help of the teacher, list in the table below which food items you want on the picnic menu!

- Can you cook the food items on the list? Does everyone know what required things we need to cook? Is everything to be cooked or can it be prepared without cooking? A plan should be made at the beginning taking information from everyone in the class. So, first of all, divide the class into groups and each group chooses each food and note down the necessary ingredients and preparation process in the table below.

Picnic Menu

1. _____
2. _____
3. _____

Name of the food:	How to prepare?
What ingredients are required?	
How long will it take?	

If no one in the group knows the recipe, i.e. how to prepare it, you can take help from the teacher, or anyone else.

- When all the groups have finished their tasks, share among yourselves. Verify if the recipes are correct, and ask your teacher or parents for help if needed. Now, let's discuss and finalize the picnic menu! When making a decision, keep in mind the ingredients, time, and complexity of the recipe.
- The menu of the picnic is set, but there is still more planning to do! First, pick a date, preferably a holiday. However, you will definitely need the help of your teacher to decide in this regard. Those of you who do not know how to cook, you will need to learn how to cook. So, have some time before the picnic date for preparation.
- Now, plan and divide the responsibilities among all in the class. While planning, you can keep the following questions in mind:
    - Will the cooking be done at school? Or do you want to bring the cooked food from home?
    - What amount of ingredients will be needed to arrange for the whole class?
    - How much time will it take for cooking?
    - Will the food ingredients be brought from home or bought from the market? How much would it cost per person to buy them?
    - How will the distribution of responsibilities and budget for organizing the picnic be maintained?
- Every team can take responsibility for a particular food item. Then, discuss what needs to be done for cooking that food item within the group. It is also important to decide what role each person will have in the team if the cooking is done at school. And if you have to bring it from home, decide how many people each person in the team will be responsible for preparing food for.
- Does anyone in your team have previous experience? If so, the rest of the team members can learn from him. Or, if no one has any experience, everyone can learn from home and share with friends at school.

What to do at home-

- Who actually does the daily cooking at your home? How much do the other members of your family participate in the kitchen activities? What responsibilities do you perform?
- Your friends who have the experience of helping in the kitchen will definitely be ahead of the rest in organizing the picnic! Why should you be left behind? The food item that your team is responsible for preparing at the picnic, try to make that item back home today! If necessary, take help from your parents or elder siblings.

Session Two

- When you come back to class, talk to your teammates about how they made the food item at home. Did they do it alone or with the help of others in the house?
- Now, let's take a closer look at the process. Think about the ingredients that were used in the food. How were the colour, taste, and smell of the ingredients before they were cooked or processed? How were they after they are cooked? Discuss with everyone and note down the changes in colour, taste, and smell for each ingredient.

Name of the ingredient		Colour	Taste	Smell	Size
	Before cooking/ processing				
	After cooking / processing				

(Do not attempt to eat raw eggs, fish, meat, or vegetables! You do not need to taste all the ingredients in their raw state.)

- Now, think a while, whether the existence of these ingredients can be felt separately in the food. How are the colours, tastes, and smells of the ingredients separately? How are the colours, tastes, and smells of the food after cooking or processing? Would there be any change in the characteristics of the food, if one of the ingredients was not added?
- When you have noted down all the observations of your team, read the section on physical and chemical changes of matter from your science book. Then, discuss again in group and decide what type of change has occurred in which of the ingredients of your food.
- As you know, the last step of any scientific investigation is to communicate the results of the investigation to everyone. So you can organize a small presentation on how to share all results with everyone.

Sessions Three and Four

- It's time for picnic!!!
- Start working on the preparations of the picnic as per previous plan. Keep notes of all the work of the team in the diary, so that it is easier to manage!
- Picnic begins...

Sessions Five and Six

- You all must have had a lot of fun at the picnic the last day! There is a unique pleasure in eating food that you have cooked yourself, isn't it? However,

some foods don't taste quite the same when they are not eaten hot. Have you ever thought why food becomes cold when you leave it? Or why ice melts and turns to water when you leave a drink with ice in it? Discuss with your friends and see what they think about this!

- Let's do a small experiment. You won't need much for this. You will need only a glass of water or juice, two pieces of ice, and a thermometer.
- First, take the temperature of the water or juice in the glass with a thermometer. You can take help from the section on measuring temperature in your book to measure the temperature.
- Now, place the ice pieces in the glass and wait for a moment to observe. The ice pieces will start to melt in a short time. Record the temperature of the glass again just before the ice pieces melt and almost merge into the water.
- Now, leave the glass for half an hour. At the end of the session, take another record of the temperature of the glass.

To keep a record of temperature, you can make a chart like below

The time of temperature record	Temperature (in Celsius scale)
Before adding ice	
Before the ice melts and mixes with water	
After leaving the glass for half an hour	

Let's put the glass aside for now. Rather let's go back to the picnic story. Well, surely you have cleaned up all the dirty dishes after eating at the picnic! If you left the leftover food outside the fridge, could you eat that food today? Of course, the food would have spoiled and emitted a bad smell? That's why we need to hold a handkerchief over our noses while passing by the dustbin!

Well, can you explain how the bad smell of rotten food or other garbage reaches our nose? Discuss your ideas on this topic with your friend next to you. You can keep the following questions in mind:

- How do we get smell? What is the idea of smell?
- How does the smell come to our nose from a distance?

- Think a while, when you get the smell of garbage, it means that particles of that garbage are truly entering your nose!! How horrible is that!
- Think about, if you smell some garbage, it means that some particles of that garbage are actually entering your nose!! What a terrible thing!
- I hope no one has any doubts about why dirty garbage should be disposed of in specific places and why the dustbin for garbage should be covered!
- We have just discussed the rotting of food. Is this a physical or chemical change? Think a while and discuss to see what the rest of the class thinks about it.
- You haven't forgotten the glass that you left for the experiment at the beginning of the session, have you? It's been half an hour! Now measure the temperature of the glass again and write it in the next row of the previous table.
- Now look at the table carefully. Compare the records of your team with other teams. Is there any difference in the results between your team and other teams? If so, how much?
- If there is a large difference in the results, compare the process and the time when you recorded the temperature. Is there any difference in the process? If so, compare them and decide which process is more logical. If necessary, make changes to the process and take another temperature reading.
- Is the temperature of the glass still changing? Or is it still the same? Why? What is the reason behind the fluctuating temperature of the water in the glass that you recorded in your table? Can you identify any connection between this event and the cooling down of cooked food? Discuss this whole matter within your team and come to a conclusion. Also, discuss with other teams to see what others think.
- You have observed the water to melt into ice in the glass. What kind of change is it, physical or chemical? Can you now determine what is a physical change and what is a chemical change among the various changes happening around us? For example, we eat green banana as vegetable, but after getting ripened, it turns into a tasty fruit with a different taste, colour, and aroma. What kind of change is this? Or when iron objects are left exposed for a long time and rust forms on them, is this a physical or chemical change? Discuss within your team to see how many physical and chemical changes you can identify based on your experience.

Physical change	Chemical change
1. 2. 3.	1. 2. 3. ... ...

- Picnic is done. You have seen how much fun it is to cook together. If everyone does it together, no one has to suffer too much. But what would happen, if the whole responsibility of the picnic fell on you alone?
- Certainly, many of you also help your parents in the kitchen at home, and you are much ahead of the others in such an important issue as cooking! And those who have less experience in the kitchen will surely not have to be told about this important issue anymore?
- Think about the questions on the left side of the table and put your answer on the right side of the table below.

Question	Your answer
Which changes in your surroundings that you have not noticed before do you notice now?	
Find out what other physical and chemical changes are taking place in the kitchen at your home!	

Home Work

- You must have got acquainted with many kitchen utensils while cooking for the picnic. Today, after returning home, make a list of all the pots, pans, spoons, etc. used in cooking at home, including pictures.
- Do you know what these materials are made of? If you don't know, you can ask your parents at home. At the same time, observe the shapes and other features of these kitchen utensils.
- See, which ones glitter when placed in the light? Again, which ones make a clinking sound when hit with something else? Again, which ones are likely to break when they fall out of the hand? With this information, write down the characteristics of all the materials in Table below.

Name of utensil	What is it made of?	Does it glitter in the light?	Does it make clinking sound when hit?	Is there any possibility of bursting or breaking if it falls?

Name of utensil	What is it made of?	Does it glitter in the light?	Does it make clinking sound when hit?	Is there any possibility of bursting or breaking if it falls?

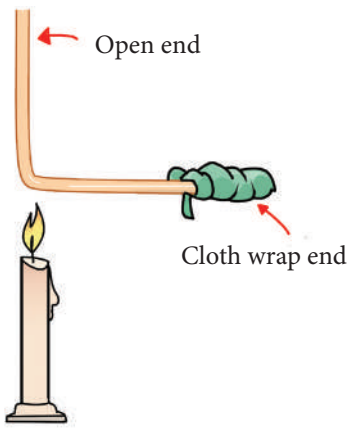
- In the same way, think about the external characteristics of the materials that are used in the connection cables of electrical appliances in your home? Do they glitter?
- Participate in the next session of this learning experience by writing down your observations.

Session Seven

- Your friends have also brought information about the kitchen utensils of their respective homes. At the beginning of this session, sit down with your friends and share the information that you have gathered by observing your own kitchen. See what kind of kitchen utensils are used in others' homes for cooking.
- Looking at the information everyone has gathered, you can understand that some materials are likely to break when dropped; for example, earthenware or glassware. But some things do not break easily when they drop out of the hand, rather they bend and make a clinking sound; for example, copper, steel or aluminum pots and pans.
- Now, let's do a small experiment.

Materials required:

Aluminum or any metal rod or wire, pliers, pieces of cloth, fire box, candle, or spirit lamp.



What to do:

- First, bend the metal rod or wire into an L shape using pliers. (As shown in the picture) Now wrap thick cloth around one end of it, leaving the other end open.
- Light a candle or spirit lamp and place the L-shaped junction of the wire over the flame and observe for a while.
- After observation, fill out Table below.

Which end was hot when you touched it?	Which end was not hot when you touched it?

Precautions: Be careful while using fire. Do the experiments very carefully so that your hands do not get too hot!

What do you think about the table above? What is the thermal conductivity of copper and cloth? Write your answer below.

Does heat conduct through copper?

.....

Does heat conduct through cloth?

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At this stage, from the chapter 'Properties of Matter and its External Effects' of your investigative study book, you along with your friends read some properties of matter like- 'Density', 'Solubility', 'Solidity and Flexibility', 'Thermal and Electrical Conductivity', 'Magnetism', and 'Identification of Matters by Properties'.

Now think a bit about it - why is plastic used as a lid or spoon handle? If there is no plastic handle, why is the cloth wrapped? Why is the burner of a gas stove made of iron or brass but the switch is made of plastic? Think and write your opinion below.

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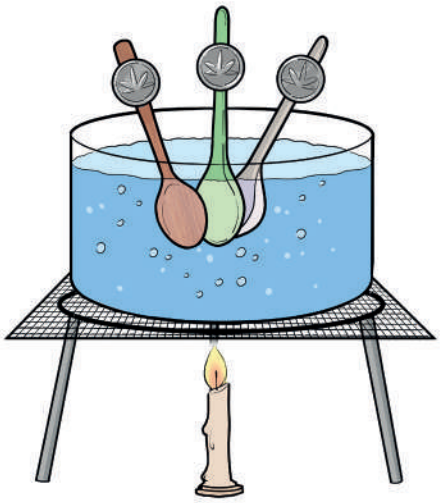
Session Eight

In the previous session, you have examined that the thermal conductivity of all materials is not the same. You have found objects made of many other materials in the kitchen. Can they be distinguished on the basis of thermal conductivity? Another experiment can be done to observe the thermal conductivity of different materials.

Materials required:

A wooden spoon, a plastic spoon, a steel or aluminum spoon of the same size, three one-taka coins, a pot for heating water, a glass of water, a candle or something else for heating, wax, firebox and any clock for measuring time.



What to do:

- Soften the wax with a little heat. Apply a small amount of soft wax to the handle of all spoons. Now place the coins on the spoon by pressing them on the wax in such a way that the coins stick to the wax. Now dip the spoons into the pot in such a way that the coins are above the top of the pot. Then keep heating the pot with a candle or something else.
- Now observe the condition of the coins stuck to the spoons. Are the coins separated? If so, which one has been separated first? How long has it taken to separate? How long have the other ones taken to separate? Write the information in the table below.

Spoon	Which one was separated first?	How long did it take to separate?
Wooden spoon		
Plastic spoon		
Metal spoon		

- Have you thought why the coin was separated from the metal spoon first? Which of the three materials has higher thermal conductivity?
- Read this section of experiment in the investigative study carefully and find the answer.

Home Work

- Think about it - why are tea cups usually made of glass or ceramic instead of metal? On the other hand, why are cooking pots made of metal instead of plastic?
- Write your thoughts below-

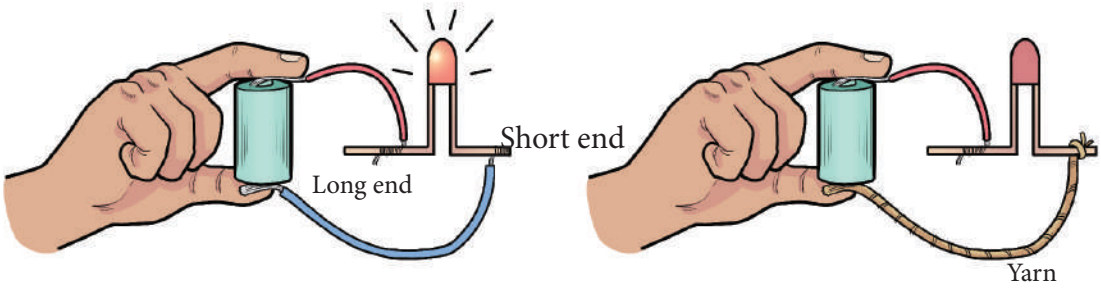
Session Nine

- This time we will cause an Electric Storm. The experiment is very easy and does not take much to do!

Materials required:

A battery, some copper wire and a diode. (You can also use a torch light bulb instead of a diode if you wish, but nowadays coloured diodes are very easily available in cheap rate), pieces of wood, plastic, rubber and paper. Well, with these few materials you can do the interesting experiment.

What to do:



- Attaching one end of the battery to the wire, connect it to the bulb as shown in the image above. Take another piece of wire from the other end of the battery and attach it to the other end of the bulb. See if the bulb lights up.
- After disconnecting the wire, place plastic, rubber, galvanized wire, yarn, nail, paper, coal etc. one by one between the wire and the bulb, and observe if the bulb lights up.
- After your observation, fill up the table below.

Materials used in the connection	Give (√) whether the bulb lighted up.	
	Lighting up	Not lighting up
Copper wire		
Rubber		
Plastic		
Paper		
Galvanized wire		
Yarn		
Nail		
Coal		

You must have realized by now, the bulb lights up because electricity can flow through copper, galvanized wire and nail. On the other hand, because the electricity could not pass through the others, the bulb did not light up. Then surely you can also tell why electrical cables or components are covered with plastic or rubber over copper wires. Write it down quickly.

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You have already known many properties of metals and non-metals. Now you can also separate them. But if force is applied to metals and non-metals, what changes do they have? Let us do another experiment.

Materials required:

An aluminum plate and a piece of coal are required for this experiment. You can bring them from your home. If you want to bring it from parents, it is better to bring old, unused plates. Why? You will see it a little later!

What to do:

Now put them on the floor and hit them with a hammer. Write in the table below if there is any change in it.

Material	Does it make clinking sound?	Does it break into pieces?	Does not break easily or is fragile?
Aluminum plate			
Pieces of coal			

Is it possible to change the shape of metals and non-metals in some other way?

(Now do you understand why you were asked to bring the old plates? What danger would it be if the new plate was hammered and bent and taken back home?)

Home Work

Leave a nail in a beaker full of water for 7 days and see what happens. After observing the nail after 7 days, draw the picture in the table below and write down the changes in the nail.

Image of nail before placing in water	Image of nail after 7 days in water

What changes do you see? Write below-

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Session Ten

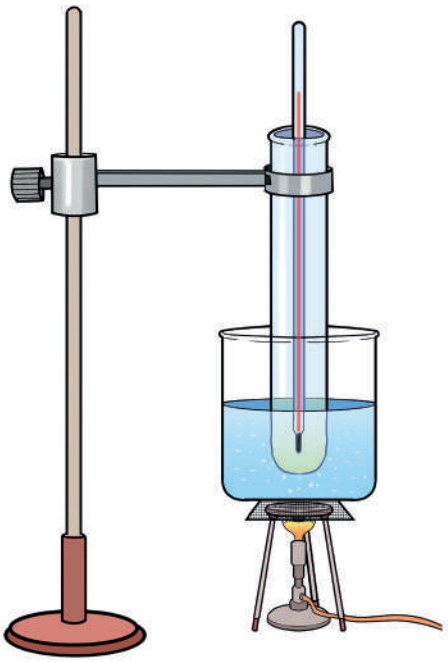
You have already known that when heat is applied, solids turn into liquids and liquids turn into gases. But do all solids melt at the same temperature? Again, do all liquids become gaseous at the same temperature? Let us do an experiment-

Materials required:

Test tube, some small pieces of wax, beaker or any pot for heating water, water, candle or spirit lamp, thermometer, wire mesh (তারজালি) or tall stand etc.

What to do:

- Take some small pieces of wax in the test tube. Take water in the beaker and place it on the spirit lamp.
- Immerse the test tube and thermometer in the beaker which is to be attached with the stand as shown in the image so that none of them touches the bottom of the beaker.
- Keep heating the bottom of the beaker with a spirit lamp.
- Pay attention to the thermometer and the wax kept in the test tube. Is the temperature rising in the thermometer? Is there any change in the condition of wax?
- Take a temperature reading on the thermometer when the wax starts to melt. This reading is the melting point of the wax. মোম জমেছে
- Now observe water. If the temperature rises, the water will start boiling at some point.
- When the temperature on the thermometer is 95 degrees Celsius, carefully look at the boiling water and the thermometer.
- Take the reading of the temperature on the thermometer at which water begins to boil. This reading is the boiling point of water.
- Now remove the water beaker, wire mesh and lamp from the bottom of the test tube.
- Note that the temperature at which wax will begin to freeze is the freezing point of wax.



The temperature at which the wax melt (Melting point)	
The temperature at which the water boil (Boiling point)	
The temperature at which the wax freez (Freezing point)	

Think a while and write the answers to the following questions-

If we used a pot with a low melting point for cooking, would it be possible to cook? Think about it, why is it convenient to cook in metal pot?

Why is cooking faster in a closed pot or in a pressure cooker than in an open or lidless pot?

Will you use metal or clay or plastic pots to keep food hot longer?

Those Who Are Our Neighbours

Do you know who our neighbours are? Don't you want to know about them? Not only human beings but also all kinds of trees, birds, animals, insects around us are also our neighbours! We also want to know about them! At the same time, we also want to know which living things have disappeared from our neighborhood. Our job this time is to look for these neighbours around us and find the ones that have disappeared.

Session One

- Have you ever noticed how many kinds of creatures there are in your home, at school, or in your neighbourhood? Let's just talk about birds, have you ever noticed how many kinds of birds are actually in your area? Just think a while! The same can be said for four-footed animals, insects, even for trees! Have you ever noticed how many flower plants can be found around you, how many vegetables are grown in your area?

- Let us do this work at the beginning of this learning experience. What do you think? First, sitting in small groups, try to remember, how many kinds of creatures have you seen while moving around?
- Now it's your turn to find yourselves! Now if everyone starts looking for all kinds of creatures, it will take a long time, right? It would be more convenient to do the work in groups. Divide into several groups with the help of the teacher. Each of the groups decides what kind of creature you will be looking for. A group might note just how many kinds of birds are in your area. Another group might list just how many insects there are. Let's start the work from the school boundary.
- Choose a nice name before you start working! Suppose your group's job is to make a list of how many types of insects there are. What could be the name of the group? 'Grasshopper' or 'Ant'? Finalize a name through discussion among all!

- Take 30 minutes time to explore the area around the school and make a list. If you want, instead of a whole team, you can go in pairs!
- Have you finished your work? Then note down on the next page the names of all the creatures that your group has seen!

Name of the Group:

Type of Creature	Name of Creature
For example: (Tree)	For example: mango tree, plum tree, etc. ..
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If you just look around the school, you will not be able to recognize all the neighbours! Now your job is to find out how many species live around each of your homes. For that, you can get the help of parents, or brothers and sisters!

Session Two

Surely you want to know what creatures your friends found around their houses! Show them how many types of creatures you have seen. Then, discussing in group, make a table by gathering all the information obtained by all of you! Now you need to share the group work with the rest of the class! If possible, share your group's information with everyone on poster paper, or in any other way.

After seeing the work of all the

groups, many lists have been found! Now, which is your favourite creature on this big list? Do you want to know more about this creature? Imagine, what will happen if everyone in the class chooses different creatures and finds out more about them! Most of the creatures in your area will be known to you then!

- Decide who will collect information about which creature with the help of the teacher.
- Now talk to your friends to find out which information would be most useful to know about a creature or an organism? What kind of information can you find by observing? For example, the eating habits of an organism can be a feature of it. Make a list of all the features that you will see.
- Now take five or seven days to gather information about the creature you have chosen.

The name of the creature:

Physical structure:	Food habits	Type of residence	Any special feature

Sessions Three, Four and Five

- Since you have been observing your chosen organism for this week, let's utilize the time more! Some of you have probably already known that the smallest unit of an organism is the cell. Take a week to develop an idea about the structure and function of cells, and how the cells of multicellular organisms form their properties. Also, on the basis of this discussion, look at the characteristics of the organism and how the classification of the organism is done from the Investigative Study book.

Sessions Six and Seven

- Whatever information you have got for a week, now share it with the rest of the team and see what others say. Compare the information you get with the information about other organisms collected by others in the group, what are the similarities and differences between the organisms.
- Now it is important to see the work of other groups. Through discussion in the class, find out about the organisms that they have gathered information from in class.
- Have you seen a wonderful thing? Gathering all the information from all of your class together gives a detailed picture of how many plants or animals there are in your area! What if it could be shared with others? And if the class six students of all the schools do the same thing, then a lot of information about hundreds of plants and animals all over Bangladesh will be gathered!! Imagine what a wonderful job that would be!
- As a start to this work, you can take the initiative to make a catalog or information chart compiling all the information in your class. That's why, fist sitting in a group, read about how organisms are classified on the basis of different characteristics from your Investigative Study book- from the chapter named 'Plants, Animals and Microorganisms'. Now decide how to create this catalog or information chart by discussing it with all the classmates as well as teachers. A sample of how information about different organisms can be presented in your catalog is given on the next page, but this is not the way to do it. But this is not at all that you must do it like this. Follow the way you want to arrange the features of all the plants and animals on your list and present them. This is just a sample!

Name of the Organism:

Name and ID of the data collector:

Type of organism (plant / bird / insect / animal):

Physical structure::

Picture of Organism
(Camera picture or hand drawing)

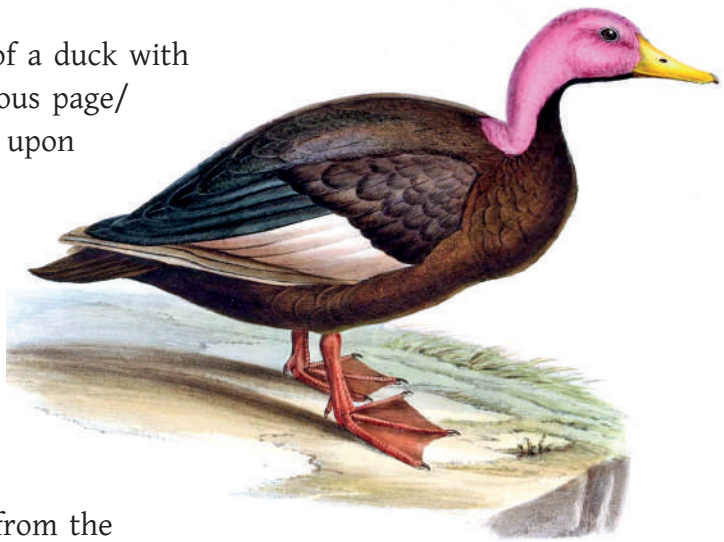
Food habit (for plants, description of flower and fruit):

Type of residence (for plants, grow in which type of soil) :

Breeding (for plants, types of seeds and propagation):

Home Task

- Has it ever happened that a next-door friend of yours has changed his residence and moved to another city, whom you will never meet again? Isn't it hard to think? Now, imagine, 'though not right next door', there were probably a lot of neighbours around us who got lost over time. The catalog that you prepared with the biodiversity in your area might include many more animals or plants that have been lost over time.
- Can you see the picture of a duck with a pink head on the previous page/ in the right/above? Once upon a time, this strangely beautiful bird could be seen in Bangladesh and India. It has not been seen anywhere else in the last few decades. It is thought that this bird has become extinct from the earth forever.



- Now your job is to find the neighbours who were once in your area, near your house. But now they are no longer seen. Maybe it's a tree, flowers you have never seen! Again, it may be a strange insect, a small bird, a snake, a fox or a wild cat!
- These neighbours were lost long ago. So, you must have never seen them! Now, can you tell how you can know about them? You're right; those who are older than you may have seen many of them. Those of you who have grandparents in your homes can ask them. You can even ask your parents, teachers, neighbours, relatives if they know about any creatures that used to be seen in your area but now are no longer seen. Write it down below what you have known after talking to different people before the session starts or during the session-

Name of the lost creature	Description of the lost creature	Was seen how many days ago	From whom you got the information

Session Eight

- Everyone in the class divide into small groups. Show the other friends in your group what you know. Surely they have also written the names of many creatures that you may not know!
- Now discuss what the reason for the loss or extinction of these creatures is? Listen to the opinion of everyone in your group, what do you think? Now, choose any plant/animal from your list, you want to find out the cause of its extinction. The rest of the group will also choose a creature as they wish.

- Write the name of the creature you have chosen here- .....
- Now think, exactly at what point of time this creature disappeared from your region. What happened in the environment of this region at that time that caused a creature to become extinct? To know that, first you have to know what the eating habit of this creature was. Where was its place of residence? Did the change in the environment in this region cause the lack of food or a place to live? Or have humans or other animals killed them? To get this information, you have to go to those who are older than you. During the session, you can get information from schoolteachers or other adults who are there. And after the session, you can get information from the older members of the family or from the neighbours.
- After getting the information, write it down in the table below-

Name of extinct creature:	
Eating habit, habitat, and other features	Reason for extinction (environmental or any other reason)

Session Nine

- In today's session, share the information you got with the rest of your group. What are the reasons for the loss of the creature you have chosen? Let them know about that too. The information obtained by your friends can also be useful to you.
- Now, all the members of your group together, read the chapter "Interdependence of living things and sustainable environment" in your investigative study book well. With the help of the teacher, join in the discussion with all the other groups in the class.
- Now look at the previous table again. You have known what kind of changes in the environment can cause a creature to be lost forever. Now, see which environmental and man-made disasters have relation with the reasons you found out about the extinction of the creature you chose.

Session Ten

- You have known the causes of extinction of many animals or plants lost at different times in the past. Now think about it, even now we are going through a lot of environmental or man-made changes. Is there s as much jungle in your area as before? Again, are the bushes, ditches, ponds in this area the same as you saw when you were younger, or are they changing year after year? When an old house is demolished, the forest is cleared and a multi-storied building is built, there is a crisis in the habitat of various species of insects, birds or rats living in that forest, isn't there?
- It is not possible to bring back previously lost creatures even if we want. But now it is your responsibility to ensure that you don't create such a threat of extinction for those who are your neighbours. Now think a little about what kind of changes are taking place in the environment around you at the moment for which plants or animals in the environment are in danger of being lost in the near future? After thinking for a while, note it down in the table below-

Creatures that are at risk of extinction	Reasons for being at risk

Creatures that are at risk of extinction	Reasons for being at risk

You have known the reasons of the fear of losing these creatures. So, if you want, you can now work to reduce the risk of their danger. You can also make others aware. Sit down with your group and make some plans on how to save these neighbours from extinction. Note down the three ideas that seem most important during the discussion –

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Session Eleven

- Now, think about how to share the catalog or information chart you made with the whole school and find out what awareness activities you can take to reduce the risk of your neighbours getting lost. Decide together and act accordingly.
- Take the teacher's help if required. You can design posters or leaflets or anything else to spread your ideas to others. Posters of all the groups can be hung inside the classroom or on the front wall so that the rest of the school becomes aware of this.

Retrospection

- How have you considered this whole thing?

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What new things have you learned that you didn't know before?

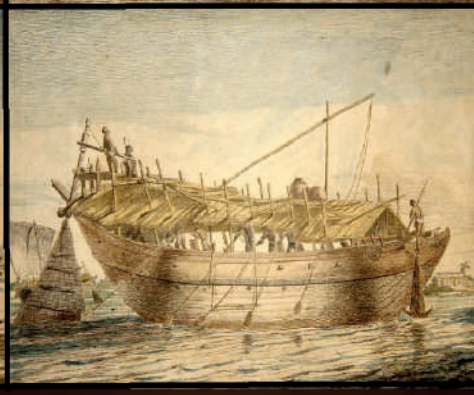


Let's make a boat!

There is no one among you who has not seen the boat! There are hardly any people in this country who have not made a paper boat and left it in the ditch on a rainy day! What if we repeat the techniques of making a boat together? But this time, let's not just make a paper boat, let's make a boat that can float in water with real weight. How do you feel?









Session One

- Bangladesh is a riverine country. Many rivers, canals, beels and haors of this country have spread in this country like a net. In the months of Ashar-Shravan, the canals, beels and rivers of Bangladesh are filled with water. Boats are, therefore, an ancient and urgent means of transport in riverine Bangladesh.
- Do you know that boats are still one of the most popular means of transport in many parts of the world, including Bangladesh? It is also important for transporting goods. Boats are widely used in Bangladesh during the rainy season. There are different types of boats in Bangladesh depending on the structure and transportation. These boats have funny names, such as- dingy, donga, kosha, sampan, bajra etc. and many more.
- Many of you must have funny experiences with boat trips. Talk to your classmates and you will see they have many stories about this boat and the river! If you remember any song or poem about river and boat, you can also perform it.
- Which of the following pictures of the boat on the other page are known to you? That is, you have ridden or seen. Write it down in the next table. Look carefully at the pictures again. With all the members of the team, think and try to answer which boats can be used for what purpose. Do the structures of the boats have any relation with their work?

Image Caption: From top, raft made of banana tree, kosha boat, rowing boat, bajra and sampan.

Table - 1

Name of boat	Ridden or seen	Not seen but heard of	Learned newly today	What is the boat used for and why?

- You must have made a paper boat and floated it in the ditch on a rainy day! Let's repeat the childhood skill now! Make a boat with a piece of paper and see how it is!
- Well, can a paper boat transport objects just like a real boat can transport people or goods from one place to another? Let's try. We can check it with the little things that are at hands in the class!
- Float everyone's boat in a big bowl or bucket one by one. Then put a small weight on top of it and see what happens! Notice well! Will the boat float like this for lifetime? Share the results you get with a friend near you and see what he thinks!
- Well, if you could make a real boat in place of a paper boat, what would it be like?
- Discuss in groups what materials can be used to make a boat. Keep in mind that the boat is durable and can carry a lot of weight!

Boat making materials-

☑	☑
☑	☑
☑	☑
☑	☑

Session Two

- You must have noticed that many objects float in the water and some of them sink. There are some objects which submerge some part of them under water and some part float above, when released into the water.
- It is very important to understand, how much the materials you have taken to make the boat will float on water.

All you need to do this experiment- Bucket or cistern, water, shola, jute stick, plastic bottle, marble, coin, nails, ice etc. small things.

Let's start the experiment now-

- First take water in a large container. Now leave the materials in the water one by one and observe - which one is sinking or which one is floating? Which one takes longer time and which one takes less time to sink? Notice which one is about to sink but is floating.
- What are the main differences between the objects quickly sinking into the water and the objects floating? Brainstorm yourselves and then discuss in groups.
- Now read the part the properties of matter from your investigative study book. Take note of the properties of matter, such as mass, volume, density, etc. Now measure the mass and volume of the objects in your experiments. Density can be easily calculated from there.
- Do you notice any easy difference considering the density?
- At the end of your observation, you will complete the picture of the pot below, drawing the pictures of the objects inside the pot. Put the sinking objects at the bottom, floating objects on top and place the objects that float in partially submerged state in the middle of the liquid's surface.
- Now, again look at the materials you have in mind for making the boat. Do you want to make any changes now?

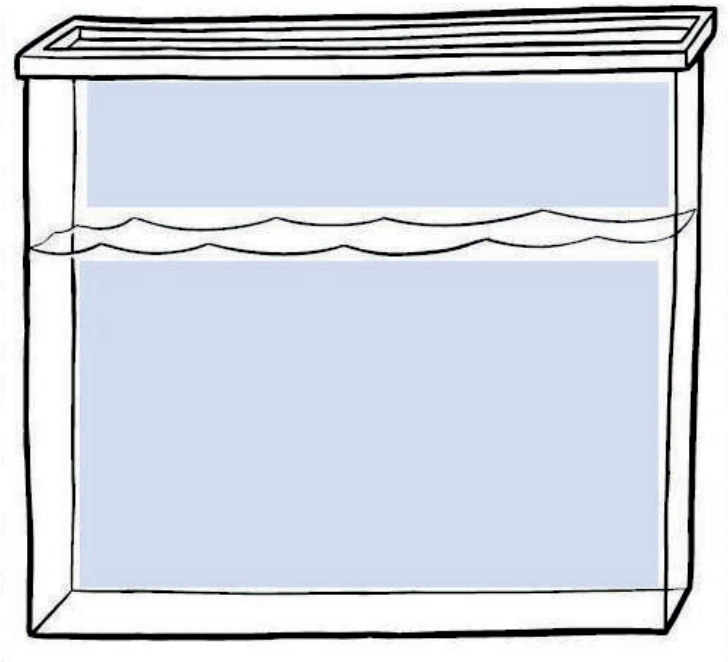


Image 1

Sessions Three and Four

- In the previous session you have seen that all objects do not sink in water in the same way. But if you give oil or sherbet instead of water, will the same result come?
- You must have seen that oil and water never mix. Oil floats on water. And in different density what happens if you leave different types of objects in water? Let's do another experiment:

  - What things you need to do the experiment-
  - Glass or large test tube, honey, water, edible dye, edible oil, nail, raisin, plastic bottle cap, ping pong ball, 50 ml beaker for measuring volume of liquid.
  - Now divide into the team given by your teacher and pour 2 drops of edible dye in 10 ml of water in a large

glass jar or large test tube. Then pour 10 ml of honey on the water. What do you see? Is honey going under water or staying on top? Now carefully pour the same amount of edible oil and see what happens? Leave the pot like this for a while and draw a picture of it.

- Then carefully drop the screw or small nail first, then raisins, plastic bottle cap, ping pong ball into the container. Then observe which one is sinking or floating in the liquid of which density.
- At the end of the observation, in the table beside, draw the picture of the floating or sinking position of the objects and do the labeling.

Now read well the part of the relationship of density with floating and sinking in water from your investigative study book. Do you find any similarities with the group work you have done? Complete Table-2.

Table 2

Serial	Name of object	Floats on which liquid	Sinks on which liquids	Why floats or sink
1				
2				
3				
4				
5				

Sessions Five and Six

- You have understood the relation of density with sinking and floating of objects in water. Now surely you have to get less suffering than before to make the boat?
- Now let's start making the model of the boat?
- You can do this group work given by the teacher outside of school taking time. But for this you need proper planning and coordination of group work. So first you sit in the classroom and finalize - what materials will be used to make the model; what kind of model will you make etc.
- Record the ideas in the notebooks and collect the easily available materials. You will try to make the boat with waste materials.
- For the convenience of floating the model boats at a certain place, the limit of its area will be fixed. The teacher in the class will tell. An example may be of length 16 cm. and width10 cm.
- Different tasks have to be shared to ensure the participation of everyone in the group. Everyone in the group will discuss and decide who can easily get which material. Then in the notebook you will sketch the draft of how and which model you will make. Try to build the structure of the boat in such a way that it can float with more weight.
- There are many ways to make a boat. Now it's your turn to brainstorm. The teacher will give you some ideas. You can get help from other books or internet if you want.

Let's draw a sketch of our boat model-

Sessions Seven and Eight

- After listening to the experience of travelling by boat and at the end of the experiment on what objects float or sink on water and experiment on liquids of different density, you have made some excellent boat models in groups. At this stage, it is time for exhibition of the boats and for experimenting which of the boats can float with the heaviest weight.
- Arrange the boats of different groups that you have made for the exhibition nicely on the classroom benches or tables or on the veranda.
- With the help of the teacher, float the boats one by one in a large pot / bucket or cistern. Then place weights of different mass on the boats. Measure how much weight which boat can carry and note it down in Table-3.

Table 3

Group name	Member	Weight on the boat	Remarks

- In this way complete the observation table -4 based on the discussion on which team's boat floats with more weight. Then decide for which technical sides of those boats, the model they have built has been able to carry more weight than the other boats.

Table 4

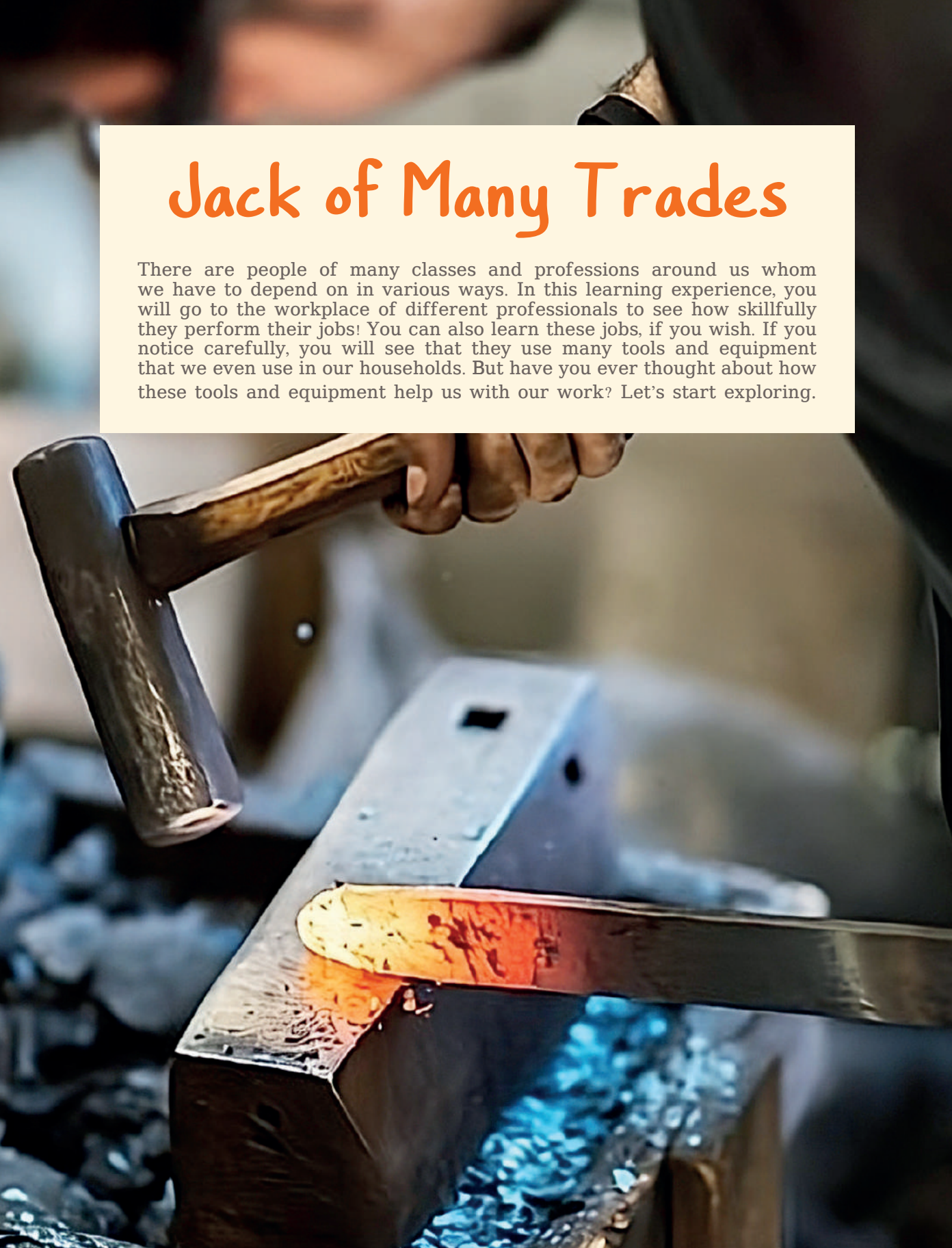
Group name	What kind of technical strategy has been used?

You all made paper planes, didn't you? If made well, it hangs in the air for quite some time even after it is thrown.

Do you find any similarity between this incident and the floating of the boat in the water?

Jack of Many Trades

There are people of many classes and professions around us whom we have to depend on in various ways. In this learning experience, you will go to the workplace of different professionals to see how skillfully they perform their jobs! You can also learn these jobs, if you wish. If you notice carefully, you will see that they use many tools and equipment that we even use in our households. But have you ever thought about how these tools and equipment help us with our work? Let's start exploring.



Session One

- First, think a while about what kind of professionals are present in your area who do different manual works (such as blacksmiths, potters, barbers, gardeners, masons, tailors, carpenters, etc.). Sit together in pairs to make a list of such professionals and keep it written below.

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- Now, think about what kind of tools these professionals use for their work to make it easier for them. Some may use heavy equipment and machinery, but you will also see many using lighter tools that don't require electricity or fuel; everything from scissors to screwdrivers falls into this category. To recognize these tools and equipment and know how they work, it is necessary to observe them in their respective fields. You can even learn how to do some tasks yourself if you want.
- Divide into groups. Decide which group will observe the work of which professionals through a lottery system or if the house is nearby, you can make this decision by taking into account the convenience of transportation. With the help of a teacher, plan a convenient day to observe their work on the spot.

What is the name of your profession?		
Where do you work?		
What tools or equipment do you use?	Tools/ Equipment	In which tasks are these used?
What are the benefits of using these tools or equipment?		
What skills are required?		

Session Two

While observing the handiwork of different professionals, you must have noticed that they use various tools or equipment that are specifically made for each task. Draw pictures of the tools or equipment in the empty space below-

Name of the Tool:	Name of the Tool:
Name of the Tool:	Name of the Tool:
Name of the Tool:	Name of the Tool:

You have seen how these tools make the user's work easier, but how? Discuss in groups for some time.

Now let's do a little experiment.

Arrange the books one after another on your bench to form a tall pillar. Now, take a ruler or any long and flat object like a board, as shown in the picture, and place it leaning on the books. Tie a bottle filled with water or any other heavy object with something and try to drag it up the slope. Does it take less or more force compared to the amount of force required to lift the object directly upwards? Can you tell why this happens? Why there is a difference? Discuss with your friends and write down your answers below.

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Now reduce the height of the slope by reducing the height of the books, or increase the length of the slope with a slightly longer board. Now try to pull the heavy object again in the same way. Do you feel lessor more weight than before? Discuss with your friends and take notes below-

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Now, think for a moment, at what angle should the slope be inclined so that the heavy object can be lifted most easily?

Collect some rubber bands for ease of understanding. Tie the rubber bands to the heavy object when lifting it. Now, adjust the height of the slope by decreasing or increasing the number of books and observe at what angle the board needs to be placed for the most effective lifting. When the rubber bands are least stretched, it indicates the least amount of force being applied.

Measure the angle of the slope using a protractor and write it down here-

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If the slope is rough, would the difficulty be less or more? Why?

- You see, it is less difficult to roll things down a slope than to pull them straight up. In our daily lives, we use this inclined plane or ramp in various areas. Besides, we also use many simple machines or techniques that make our work easier. You have observed many such tools while gathering information about different professionals. Now let's learn how these tools make our work easier.
- Read Chapter 9, Section 9.2, about simple machines thoroughly in your Science Investigative Study book. Can you understand the characteristics of simple machines? Discuss it with the rest of the class.

- Now it's time to see, the tools or techniques that we talked about so far fall into what type of simple tools. Therefore, before the next session, read and learn about the six types of simple machines mentioned in the Investigative Study.

Session Three

- You have surely learnt about different types of simple machines from home, right? Now, sitting in pairs, discuss the simple machines that you have learnt from the Investigative Study book and revise them once again.
- Now think about it- do you see any use of these different types of simple machines in your daily life? Discuss among yourselves and write down in the table below, in which technologies are these used?

Type of simple machine	In which every day used technology, there is the use of it?
Lever	
Inclined plane	
Screw	
Wheel and axle	
Pulley	
Wedge	

Let's go back to the previous discussion. You gathered information about the tools and machines used by various professionals. Now think about the professional tools that you have written in the table above- is there any use of simple machines? Which of these fall into which kind of simple machine? Discuss in pairs and write the table below. Once you have completed writing, listen to what other classmates have written. Also, share your thoughts and opinions with others.

What types of simple machine?					
Lever	Pulley	Inclined plane	Wheel and axle	Wedge	Screw

Home Task

- If you pay a little attention in your home, you will find various types of simple machines. Go home today and find them and fill in the table below. An example is given.
- For the next session, bring three types of simple machines to the school. You can write your name or roll number on the machines when bringing them so that they don't get mixed up with others. Because you have to take them back home again!

Name of simple machine	Type	The work where it is used
1. Knife	Wedge	To cut the fruit

Session Four

- At the beginning of this session, set up a few benches in the classroom and arrange the simple machines that you brought from home. While arranging them, group the machines according to their types, that is, all the levers in one place, all the pulleys in one place, and so on.
- Observe each simple machine carefully. Are all the machines of the same type? When you look at the several screwdrivers or scissors that have come here, do you think they are all the same? If not, why? You can definitely notice a difference in their shapes. Does the difference in shape provide any

specific advantage in working?

Discuss in pairs and write down...

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Let's do a small experiment to see the relationship between the size and shape of the simple machines and their mechanical advantages. A little while ago, while reading about six types of simple machines, you have known about their mechanical advantages. Now, based on that, discuss with your friends.

Now you can surely understand that each simple machine is designed differently to increase or decrease its mechanical advantage according to specific needs.

If you do the test, you will understand more easily. For that fill a sack or shopping bag with some sand or soil. If you don't find sand or soil nearby, you can use any other heavy object instead. Gather a brick or stone or a piece of wood and a long bamboo or stick.

In the beginning, try to lift the sack yourself by the hands. It seems very heavy, doesn't it?

Now, make a lever using bricks and bamboo. Here, the brick acts as a fulcrum. The weight-bearing side (x) (ভারবাহু), which is where the sack is placed, is opposite to the force side (y) (বলবাহু), which is where you apply the force. See if you can easily lift the sack upward in this position by applying force.

- Experience the mechanical advantage of applying force to the lever by changing the position of the brick or fulcrum and placing it in different places.
- Measure the lengths of weight-bearing side (x) (ভারবাহু) and force side (y) (বলবাহু) from fulcrum by using a tape measure or ruler. Now, determine the ratio between these two lengths that would make it easiest to lift the weight. In the same way, find out the ratio between these two lengths that would make it most difficult to lift. Discuss to calculate and write down the calculations on the side.

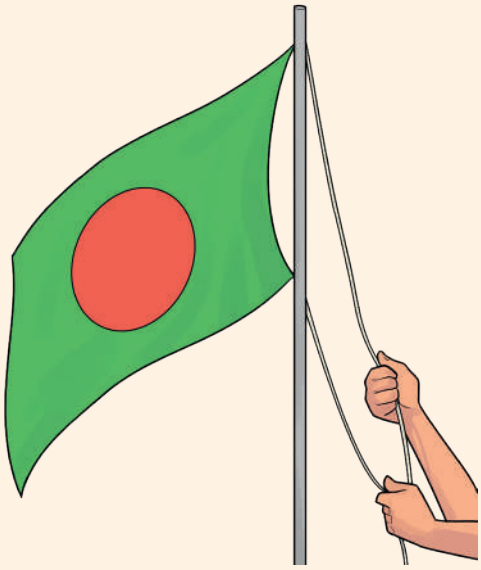
Applicable Field	length of weight-bearing side (x)	lengths of force side (y)	Ratio
Lifting weight is easy			
Lifting weight is difficult			

- After completing the experiment, draw a picture about the position of the fulcrum at which the sack could be easily lifted with the lever.

- Wouldn't it be necessary to thank the professional whose work your team observed and gained so much knowledge about simple machines? How would it be if you make something with your own hands as a gift for him?
- Discuss in groups and make a basic plan first. Determine the tools and equipment you will need to perform the task in the next session. Some items are already in your classroom. Keep aside the ones that are necessary for the task and take the rest back home.

Home Task

From the images below, identify what kind of simple machine is used for what purpose or where, and write down in your notebook.



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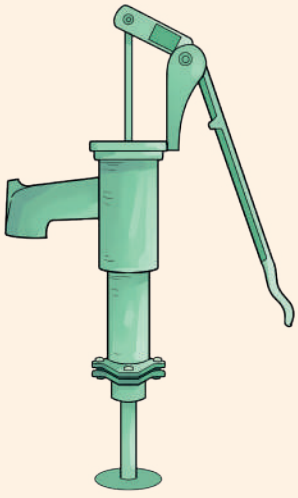

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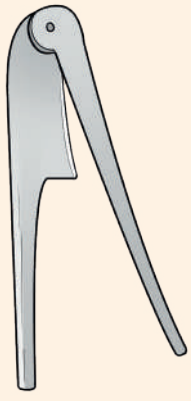

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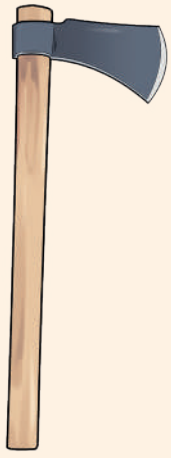


(d)

(e)

Session Five

- In today's session, you will spend half of the time working on preparing a gift. In the remaining half, in the classroom you will spend talking to the invited professional whom you have observed. If it is not possible to bring him to the classroom (as he might be very busy to work constantly to earn his living), then after school, you will go and give him the gift.
- You must have used knives, scissors or other such tools to make the gift? Now think about it, do they fall into any kind of simple machine? If yes, then how is the mechanical advantage available? Discuss again in groups and write the answers in the table below-

List of tools needed to make the gift	What kind of simple machine?	How do you get the mechanical advantage in terms of use?

- Well, does any part of our body work like a simple machine? Do we directly use any body part as a simple machine in our daily activities? Discuss in pairs and think carefully before writing down below. In this case, you can mark the parts like fulcrum, axis (অক্ষ) etc. by drawing picture.

- Finally, think about one more thing. Is there anything that increases or decreases friction in the simple machines that you have used? Read the section on 'Reducing and Increasing Friction' from the Investigative Study book and answer with a little thought.

- Can you write about how friction force in your daily life helps in some cases and causes difficulties in some cases?

How friction force helps	How friction force causes difficulties

- Now, spend time with the invited guest. Discuss his work and the tools (simple machines) that uses in his work. Let him know how observing his work practically helped you learn about simple machines. He will surely be pleased to know. Finally, hand over the gift that you made to him and say goodbye.

The Course of the Moon and the Sun

It is hard to find anyone who has not been overwhelmed by the moonlight on a full moon. Almost everyone has experienced a full moon or a new moon (Amabasya in Bangla), but have anyone of you ever seen a lunar or solar eclipse? From the ancient times, people have seen these strange phenomena; have searched for the reasons for them; have come up with various rational and irrational explanations; have been in danger due to misunderstandings. In this learning experience, you will get some acquaintance with the experience of the ancient people, but you will also search for the scientific explanation of these events yourselves.

Sessions One and Two

Let us read a story at the beginning of this learning experience. Calling it a story might not be right as the incident is true, taken from the pages of history.

The Cursed Moon

One evening in February 1504, the indigenous or native people of Jamaica were horrified to discover that the full moon was engulfed in darkness. So, was God's wrath really coming down on them?

The beginning of the incident started several months ago. Many of you might have heard one of the characters of the incident whose name is Christopher Columbus. Yes, we know that the famous Spanish explorer Columbus was the first white man to set foot on the soil of America.

The fleet of Columbus anchored off Jamaican beaches in the middle of 1503. The native people of Jamaica were absolutely harmless and peaceful, and they gave a warm welcome to these foreign sailors. Therefore, Columbus did not face any difficulty to get food and other supplies from them in exchange for only a few things.

The problem started six months later. The native people were naturally getting a little annoyed at this regular supply of food to them month after month. Moreover, the people with Columbus were arrogant. They started chaos in the area. The indigenous people were very annoyed and made it clear that they would not help any of them. The foreigners needed to arrange their food supply themselves.

Columbus fell into a great trouble. Because there was no way for them to leave the area before the rescue ship from Spain would arrive. There were only two ships in his fleet, the rest of the ships had already been abandoned. The bigger danger was that there was no food on the ship. These indigenous people had been the last hope; but they were not any more ready to supply their food. Finally cunning Columbus desperately made a strange trick!

Columbus called the leader of the indigenous natives! Upon his arrival, Columbus solemnly stated that the white men's God was very angry with the natives for not helping his people with supplies. Now the people there would face the consequences of that anger. Three days from that day, the full moon supposed to be in the sky, would be swallowed by the dark power, and the great disaster will descend on the indigenous people!

Naturally, the local leader did not pay much attention to his threats. Three days passed. That evening, the natives of Jamaica discovered with surprise and horror that the moon of that night was no longer the same as other nights. It was as if some evil force was swallowing the full moon; darkness was slowly covering the moon's light. All the simple natives came running to Columbus in fear and panic. They apologized with folded hands, held hands and feet so that Columbus would convince his God to withdraw that curse! In return, they would not mind providing the supplies for that whole team for as long as they needed!

Columbus was waiting for it. He closed the door of his cabin to talk to God in private. Hour after hour went by, while the moon was almost engulfed by black darkness, everyone's fear was at its peak! After much time, the door of the cabin opened, and Columbus came out with good news. God calmed down, he agreed to lift his curse. It indeed happened so. Within short time, the darkness on the moon began to disappear. That previous bright moon slowly returned to the sky. The people of the area breathed free. After that incident, Columbus had to stay in this area with the team for a few more months, but their supply crisis never happened again!

- Some of you must have already understood what really happened that night. You guessed it right, there was a lunar eclipse that night and Columbus was aware of it. Using this information, he came up with the idea of cheating the simple natives there. He was helped in that work by a calendar prepared by a famous German astronomer, in which the course of the moon and the sun was calculated for several years. In those days, the only way to keep a ship's course on a voyage was the movement of the moon, stars, and sun in the sky. Sailors used to keep such calendars with them. And it was no problem for Columbus to find out the exact date of the lunar eclipse by using this calendar. He also knew how long the lunar eclipse would take place, so he sat in the cabin and closed the door the whole time!
- How did this whole story come to light? Columbus was accompanied on this expedition by his own son - Ferdinand. This strange story is known later in the essay written by him.
- Although Columbus did not use the knowledge of astronomy for a very good purpose, it is not the fault of science! The astronomer who made this calendar

had to calculate the date of the lunar eclipse by doing a lot of calculations. Even if we do not get into that difficult calculation, can you tell what exactly happens during a lunar eclipse?

Divide yourselves into small groups and discuss on your own. Based on the discussion, write or draw below your explanation of how lunar eclipses occur-

Now you can share your ideas with other groups. However, it is necessary to check how correct your explanation is. The best way to check is to make models yourselves. We all know that the earth revolves around the sun and the moon revolves around the earth. Besides, you all know that the moon's light is not its own but borrowed from the sun. By making a model of the orbits of the moon, sun, and earth, you can prove that a lunar eclipse will occur if the sun, moon, and earth are in some specific position. You already know that no object in the space, including the sun, is completely static. However, since we do not have to worry about any object outside the solar system at the moment, it is convenient to make the model by assuming the sun to be fixed for the time being.

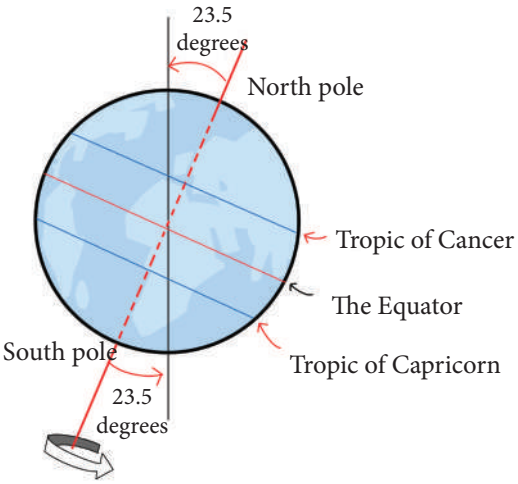
Discuss among your group mates how you want to build the model. Since you need to observe where and how the sunlight is falling, it is useful to assume one of the light sources as the sun. It can be a candle light or a lamp- think about what to use. Again, to make the Moon and the Earth, you can use an object

like a round ball- you can paint a light ping pong ball, or make a ball with cork sheet. Apart from this, a thousand ideas can come, you think and decide which one to apply. In order to know when the lunar eclipse will be visible from which area, it is necessary to observe where and when the light will fall on the surface of the earth. That is why you can draw the continents on the model of the earth by observing a globe. But before that, draw the geographical lines.

- At the very beginning, fix the positions of north pole and south pole. Now at the globe, observe the north and south sides of the equator and place the continents. It is even more fun if you can identify a few countries on the model of the earth. For example, countries like Bangladesh, America, Australia, England and Brazil can be marked with the locations of the countries. Then you can easily understand when the sun and moon will be seen in which positions from which country.
- The Earth's orbit around the sun and the moon's orbit around the earth can be hung with strings to show. If you want, you can find other ideas. The model is expected to be ready before the next session.

Geographical line

In order to analyze the geographical position of the earth, some lines are imagined on it. The most important line of these is called the equator and it runs east-west right along the belly of the earth. The equator divides the earth into northern and southern hemispheres.



The next two important lines are Tropic of Cancer and Tropic of Capricorn. Tropic of Cancer lies 23.5 degrees north of the equator and Tropic of Capricorn 23.5 degrees south and is extended east-west.

Sessions Three and Four

- All teams must have brought their own models to today's session. At the end of making your model, set different positions of the earth and the moon to show where and how the sunlight is falling. Before going to the explanation of the lunar eclipse, let us revise the knowledge learnt earlier in today's session, what do you say?

- In the previous class, you studied the earth's rotation/diurnal motion and annual motion. You have also seen why there is a difference between day and night. Can you show in your model the rotation of the earth around the sun, when it is day and when it is night?
- Here is a short question- if it remains the way that you just showed it, will the length of day and night be the same anywhere in the world? Choose a place and observe it well. Think about it now, what does our real experiences say? Does the Sun set at the same time throughout the year? Write down your experience-
  - ➲ Is the length of day longer or shorter than the length of night in winter? .....
  - ➲ Is the length of day longer or shorter than the length of night in summer? .....
- Now read the section on earth's rotation/diurnal motion and annual motion from Chapter 9 of your investigative study book and discuss it with the rest of the class. You can surely understand why the length of day and night is different? Is the earth tilted at an angle of 23.5 degrees in your model? If not, fix it now.
- Now let us talk about the change of season. You have studied it too in the previous class. Yet, let us revise it a little further. Do you remember the countries that you marked while creating the model? Now again in your model, rotate the earth around the sun and note how the sunlight falls on a country. Then note down which country will be cold and which country will be hot on the following dates. But before that, you can read the section on 'Seasons' and 'Differences of Weather in Different Regions of the Earth' from your investigative study book and discuss it in groups.

Name of Country	Feelings of temperature at certain times of the year (cold/hot/ between cold and hot)			
	21 June	23 September	22 December	21 March
Bangladesh				
Australia				
America				
Brazil				
England				

Sessions Five and Six

- We have talked plenty about the sun and the earth. Now let us pay attention to the moon. The discussion started with lunar eclipse, and we will go back to that. But before that, let us visualize two of our most familiar experiences about the moon. All of you must have seen full moon and new moon; maybe many of you know why they happen. You can set the positions of the sun, moon and earth in your model to show when the full moon and new moon occur? All the team members try together.
- Now draw in the blank space below how the full moon and new moon occur according to your explanation - Now read the section on Crescent from your investigative study book and match it with your ideas.

The Full Moon

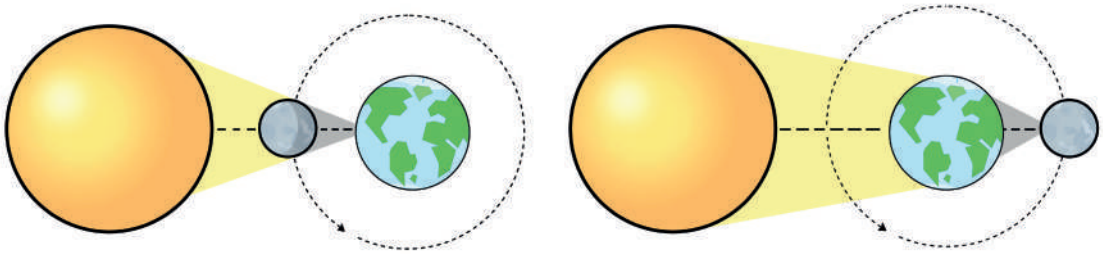
The New Moon

- Now read the Crescent section from your investigative study book and match it with your ideas.

Home Task

- Since you have known about crescent, look up at the sky tonight to see what the moon looks like. Draw a picture of today's moon in the blank space beside.
- Can you understand by looking at the size of the moon whether it is now bright fortnight (শুক্লপক্ষ) or dark fortnight (কৃষ্ণপক্ষ). Write down your ideas and compare them later-

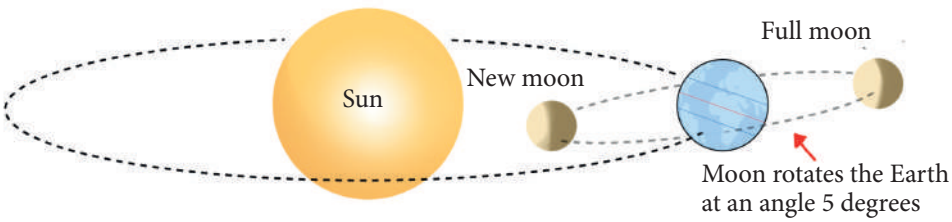
- Now let us go back to the lunar eclipse. From the explanation that you gave in the first session, show in the model how the positions of the earth, the sun, and the moon will cause a lunar eclipse? Can you also figure out when the solar eclipse will occur? Show this explanation from your model to others, you also see other's models.
- In simple terms, many of you might have said that a lunar eclipse occurs when the earth's shadow falls on the moon. That is, when the sun's light is intercepted by the earth midway before it falls on the moon. Among the earth, the moon, and the sun, the sun is the only one that has its own light, and it is because that light is reflected off the back of the Moon. So, we see the light of a full moon. Thus, whenever the Earth rotates and comes between the sun and the moon, the earth's shadow falls on the moon. From the earth we see the moon as if it is being swallowed by a thick darkness; we call this event lunar eclipse. Similarly, if the moon comes between the earth and the sun during its rotation, it covers the light of the sun. This is the shadow we see on the sun from earth, and this event is called a solar eclipse.



Think about it now and see if you have any doubt. Do you find any similarity between the explanations of full moon and lunar eclipse? Compare the positions of the Earth, Sun and Moon in these two events. Write your thoughts below-

If these two events are similar, think about it now, why don't we see a lunar eclipse every full moon? Similarly, why doesn't a solar eclipse occur in every new moon? Discuss among yourselves and see what others think. Now sit in groups and read the lunar eclipse section from your investigative study book and join the discussion with the whole class.

By now you must have understood that the earth revolves around the sun, and the moon revolves around the earth-the surface of these two circular paths is not the same. Does your model need to be revised? Discuss how to do it. If necessary, you can do corrections even after the session.



Now let us come to another new topic. You already know that everything in the universe attracts each other. The heavier the objects and the closer they are to each other, the stronger is this attraction. Since the moon is closer to

the earth, the moon's attraction on the Earth is much greater, and because of this, some of very strange phenomena occur.

- If any of you have visited Cox's Bazar, you might have seen that red flags fly on the beach at low tide, and people are warned not to go too far into the water. During low tide, the water in the sea decreases, and during high tide, it increases. The main reason for this phenomenon is the attraction of the moon towards the earth. But can you guess how this happens?

- Discuss with friends and try to guess. Then read from your investigative study book the explanation of tides, spring tide-neap tide and join the discussion with the rest of the class including the teacher.

- Find out the date of the next lunar eclipse from the Internet or any other means, then you can witness this great phenomenon yourselves!

- Can a lunar eclipse be seen from anywhere in the world? What do you think? Try to understand from your moon-sun-earth model, you can also discuss among your friends. After the discussion, write down what you think, do not forget to write arguments for your opinion!

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Mechanism of Body Clock

The job of science is to look into everything, from the structure of the vast universe to how a tiny wristwatch informs the time by ticking, and we have no end of questions. But have we ever wondered how the machine called our body works? Let us turn our eyes a little and try to understand this strange machine called human body!

Sessions One and Two

Coming to study science, so many things we have known and seen, haven't we? In the last few months, from the galaxy of the universe to tiny ants on the wall - you have brainstormed on so many things! But have you ever taken a good look at yourself in the crowd of so many things? Have you ever wondered how the mechanisms of this incredible machine called the human body work? In this learning experience, we will take a closer look at this device.

First of all, think about the parts of your own body that you can see with bare eyes from outside. If you notice carefully, you will see that these organs are of some use to us; For example, we see with our eyes, we hear with our ears. In this way, think a little more about what other external organs are useful for us. Take notes of what you have got in the table below-

The parts of the body that can be seen from outside	Why you need these

Now let us come to the internal mechanisms of the body. For example, our hands or feet can be seen from the outside, but can we see the very important brain inside our head from the outside? There are many other parts of our body that we do not see from outside, but if they do not work properly, we

will be immobilized! As before, now remember the organs inside the body, put them in the following table. Besides, do not forget to write what these organs do!

The organs that are inside the body	The functions that they do

- Talking to the friend next to you, see what organs he has written about. Has he written about any important organ that you missed?
- Discuss with the rest of the class including the teacher. Surely all of you have written about various organs, all of which do all the important works of our body. Heart, lungs, brain, stomach, all these organs may have been discussed.
- Now we will play a fun game! First, divide the class into six groups. Now write these six names on a small piece of paper and fold them - heart, lungs, brain, stomach, kidney, and bone or skeleton. Now do a lottery and pick one piece for each group.
- Your team's name is the organ name that has come to your team's fate. What is the name of your team? Now you have to organize a debate competition. You

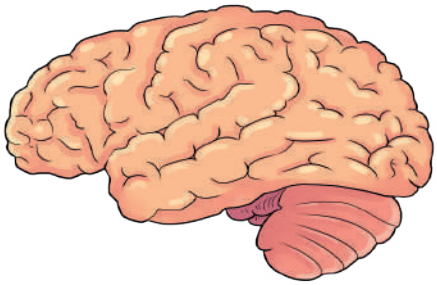
can also call it acting rather than debate. Because each of you will act as that organ. Each group must explain to others why they are the most important organ or system in the body! For example, the brain group will argue why it (that is, the brain) is the most important part of the human body! Again, the stomach group will argue that there is nothing more important than the stomach in the human body!

- Don't you need a bit of preparation before you organize your team's arguments? If you do not know well about the organs in the human body, it will be difficult to argue! That's why, everyone in the group can read the chapter 'Human Body' (Chapter Eleven) in your science investigative study. You will get in this chapter the discussion how different organs are formed in our body, how they work. If there is a problem in understanding something, you can talk in groups, and you can also take the help of the teacher.

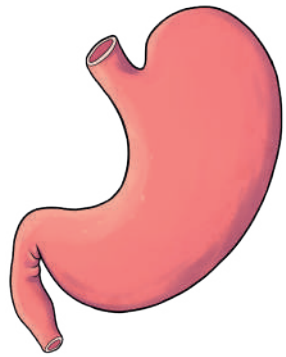
Sessions Three and Four

- Debate competition will be held in this session. So, get all the preparations of your team before the session starts. Arrange the arguments of your team-how to make others understand that you are the most important part of the whole human body!
- Write down your team's name and other information in the table below so that you do not lose the arguments later.

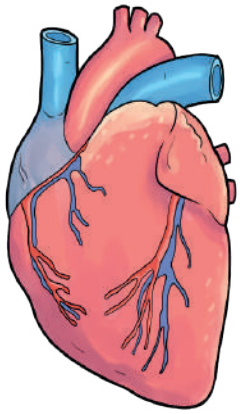
Name of Group:	
Description of the prescribed organ:	
Part of which system? What does this system do in the body?	
Why is it the most useful organ?	



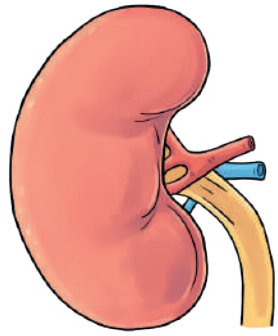
The brain



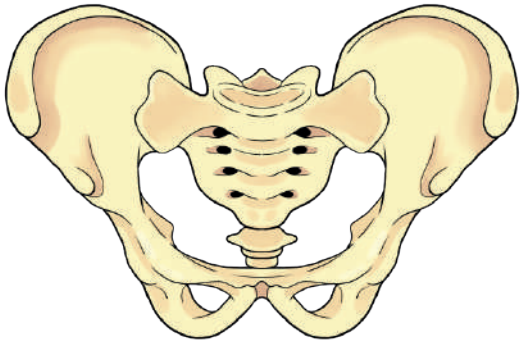
The Stomach



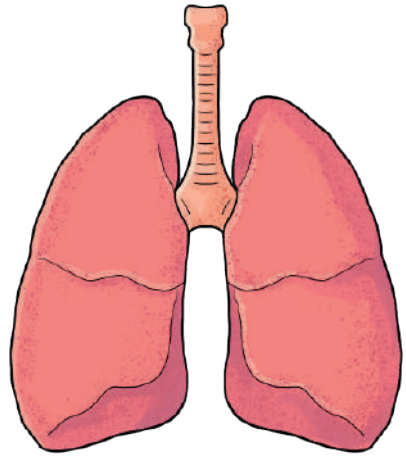
The Heart



The Kidney



The Bones



The Lungs

- Is the preparation over? Now it is time to debate. On the next page, there are pictures of these six organs, if you want you can draw on paper, or use poster paper to design a picture, logo, or symbol of your team. Thus, just seeing you, everyone will understand what organ your team represents! (These pictures are given like this for the convenience of drawing. How big is the real lung or kidney, where is it in the body — you will know more details about these issues in higher classes.)
- In the debate, each team will have five minutes to present their arguments. Your job is to score the other team during their debate. Again, while you are presenting, the other teams will also mark you in the same way. But no one can give marks to their own team!
- Marking will be done keeping in mind three things: presentation, use of information and argumentation. If you want, you can evaluate each team within the total of 30 marks by taking 10 marks in each of these three subjects. Thus-

Name of the Team		
Issues to consider	Total marks	Marks obtained
Presentation	10	
Use of information	10	
Argumentation	10	
Total marks obtained by the team =		

- Who won the debate? Write down the name of the winning team here, ...

Sessions Five and Six

- Here is a quick quiz - the six organs that you argued about are directly involved in the work of the six systems. But beyond these, there are three other systems which do some very important work. You must have come to know about them from the investigative study. Write the names of those three systems in the table of the next page, and then write their functions in very few words, in two or three lines in your own language. If you want, you can look at the book again and discuss it with your friends.

Name of System	Function

Someone must have won the debate! Those who won must be very happy! And others may have been a little bit upset! But now think about one thing with a cool head. Although the winning team won by arguing that their organ is the most important in the body, what would happen if the other organs stopped working in the body? If there was a real competition among the body parts like your class groups, and everyone thought of everyone as a rival, what would happen- think about it!

- You can understand if you consider the body as a running system, the system runs not through competition among its different parts, but through cooperation. We go around, return, eat, do our daily work, enjoy - if any part of the body is damaged, the joy is far away and the daily life seems full of trouble. So, to be healthy, you have to take care of this entire body system so that all the systems can work together.

  (Since the competition itself is quite ridiculous, there is no prize involved. Rather, the winning team can feed everyone a piece of chocolate for this occasion, what do you say?)

- Since the topic of body care has come in discussion, what do you say if we make some plans for our own body care at this time? Discuss among friends- how to do that, what will keep all the systems of this incredibly complex machine called the body working properly and keep you healthy. If you want, you can also take the help of the investigative study.

- Better to know a little more about yourself before planning your own care. You are teenagers now, just a few days ago you were children. Now in this adolescence, all humans have to go through some strange experiences, as a result of which we grow up slowly. If you do not know about them well, there may be lack of taking care of your body and mind, and on the other hand, many misconceptions or superstitions may enter your mind.

- Read the Adolescence section of Human Body chapter from your science investigative study book and discuss among yourselves, so that no misconception can get rooted in your mind.

- You must have known how important it is to eat well, sleep timely, and stay clean. Now your task is to create a short routine for yourself. Eating, showering, studying, exercising, hanging out with friends, reading story books, painting or any other hobby can all come into the routine. It may seem difficult to follow minutely every day, but what is the harm in trying?

- The table on the next page provides a draft of a weekly routine with possible tasks (for example, a daily routine is also timed. You decide the time and tasks at your convenience). Apart from this, if you want to keep your other work, you can put it in the empty space of the table. There is no obligation to do all the work every day. Set the day of the week, when, what work you will do at your convenience.

	Time Distribution							
Task	Sunday (Example)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Waking up	Morning 6:30							
Breakfast	Morning 7:30							
School time	Morning 8:00-2.00							
Shower	Noon 2:15							
Lunch	Noon 2:30							
Reading story book/ drawing/ gossiping with family members	Noon 3:00-4:00							
Exercise/ Playing	Afternoon 4:30-6:00							
Afternoon snacks	Evening 6:15							
Chatting with friends	During the school tiffin time							

Task	Time Distribution							
	Sunday (Example)	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Study	Evening 6:30-8:00							
Dinner	Night 08:00							
Going to sleep	Night 09:00							

This routine is solely for your own use, not to be held accountable to anyone by the clock. But it is not a problem to share with everyone, right? You can share this routine with your friends, or teacher if you want. But do not forget to share your feelings after following the routine!

Lives All Over The World

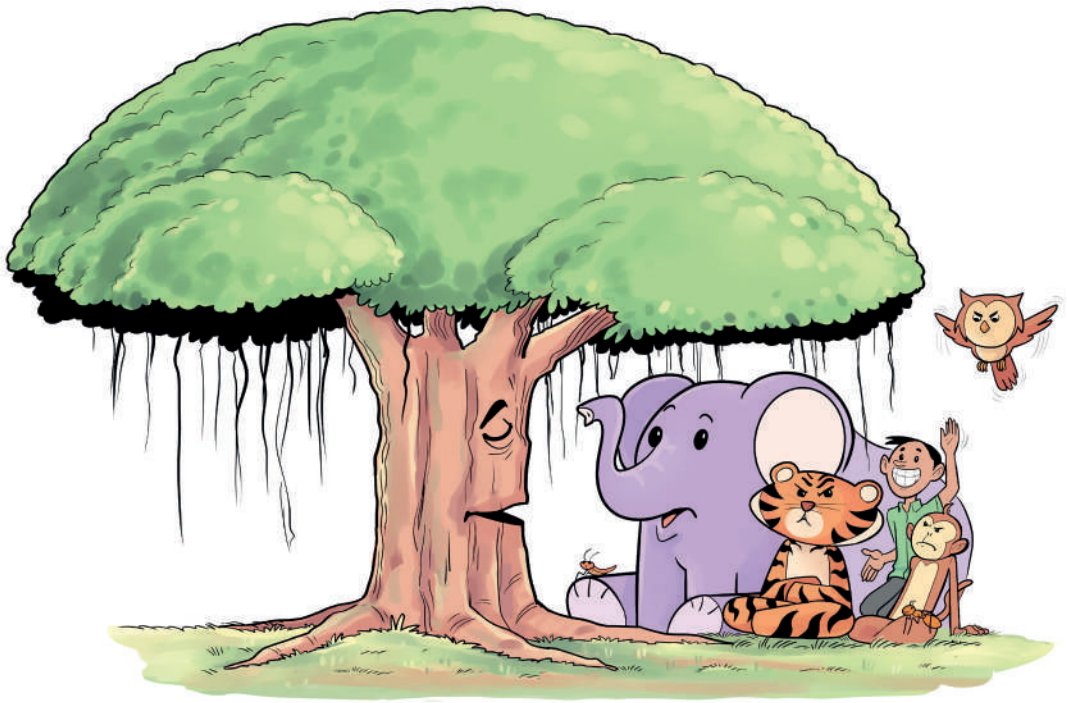
How do you like to read story books or watch dramas? What if characters in the drama are something other than human beings? What if the story is your own? Let's see-

Session One

- A few days ago, you found out all the neighbours in your area (you must remember the learning experience of 'our neighbours)! Some of these neighbours live inside your own homes (e.g. small but hard-working ants), some live in nests on tree branches (e.g. crows with a hoarse voice but very intelligent birds), and others spend their lives sitting at one place spreading their roots in the posture of meditation (e.g. huge banyan tree near the school). Now think if there are any neighbours whom we don't see? Take for example, numerous microorganisms live around us, even in our bodies, which are almost invisible! We can't even see them with our naked eyes.
- Let's make the list of neighbours a little longer by including all those we see or don't see. What do you say? No, don't be afraid! You don't have to observe the invisible viruses or bacteria for a week! Instead, let's do a fun thing together.
- Here is a story for you (Leader of the Living Beings). But the characters in this story are not just human rather you can find some of your neighbours in this story. There's a surprise at the end of the story, but I'm not saying that right now! For now, everyone in the class should be divided into a few groups. Then read the story together in the group!

Leader of the Living Beings

Writer : Muhammed Zafar Iqbal



With a coughing sound, the old banyan tree started talking, “Friends! Today we are all here for a special purpose.”

Those who had been very impatient for so long became silent. All the living creatures of the world were called to today's meeting with a very urgent notice. From viruses, bacteria to plants, spiders, elephants and rhinos all are present. However, no one knows why everyone has been called.

The banyan tree says, “Friends, there is extreme chaos among our living creatures. There is extreme violence among one another. There is no love and coordination among us. The climate has changed so much that at some point the earth's fauna could become extinct. We have to decide how to protect ourselves..”

The elephant says, “No use of it. No one will listen. Everyone will continue to quarrel among themselves.”

"We really need a leader," the cockroach says, “Then everyone will listen to that leader.”

The monkey says, "It's true. We monkeys are the most intelligent, we should be the leader! What is the importance of so much discussion about this?”

The man at the meeting stands up and says, "But I knew we humans were the most intelligent."

As soon as the man finishes speaking, everyone from all around protests by chirping, squeaking, rumbling, cawing, barking, mewing. Everyone keeps saying, “What did you say? Are people intelligent? People are the most foolish. This state of the environment is due to their stupidity; because of them the world is in such a catastrophe today!”

That's right. So, the man quickly sits down with his head down.

The monkey says, "Yes, what I was saying is that only we, as truly intelligent creatures, have the ability to be the leader."

The tiger grits his teeth and says, "If you become a leader, there will be no more law and order in the forest!"

The banyan tree looks at the others and says, “Oh! I say, stop the quarrel. Let me listen to others.”

Suddenly a soft voice is heard, "I want to talk a bit ..."

Everyone looks left and right, but there is no one! "You won't see me," says the soft voice. “I'm a virus! We are the only ones to compare to ourselves. So, we should be the leader! We survive like an inanimate object, but who stops us if only one of us can enter your body? Then we capture the cells one by one like a living creature! Humans also become overwhelmed by our fear! A few days ago, our Corona brothers hit the humans very hard. Have you forgotten that?”

As soon as everyone starts shouting, another invisible voice stops everyone and continues, “There is no point in shouting. The virus did not say anything wrong! What does it matter though the animals are big in size; everyone is a coward inside! If you see something bigger than you in size, you just run away. And think of a bacterium like me! Our brothers and sisters are inside all animals. They live even inside people's stomachs, inside their mouths, under their skin, as if they made a colony there. But no animals can even feel it! From that point of view, you all should accept us the bacteria as the leader!”

"Stop arguing so much!" The tiger says in an annoyed voice, “The tiger was the king of the forest all his life, now I see that everyone wishes to be a leader! If you can, come and fight with me! Let's see who wins!”

There was a hushed buzz in the meeting, but everyone becomes a little scared and silent when they hear the tiger.

“Now, listen to us ---,” says an ant from the branch of a tree. “This is a problem for all of you! Only quarrels and quarrels! How much work do we ants do together! If you learn a little by watching it! Humans are so proud of themselves, but we are much more industrious than humans. The tiger is so fond of being a leader. When there are a few tigers in an area, they start fighting. And we live in a family of hundreds of ants together. The way we build a city under the ground

will make everyone's eyes glaze over!"

The owl had been trying to sleep in the hollow of the banyan tree for a long time. Unable to tolerate the sound of talking, he comes out and with a yawning he says, "Look, a lot has happened! Now stop for a moment and listen to me. Whatever you are saying, there is logic in everyone's words. But one thing is for sure, you observe everything standing on the ground. You don't even come to know if the enemy does not come very close to you! But the birds see everything from above. Especially the owls like us — we roam in the night sky in complete silence, no one knows more than us where what is happening. That is why we should be the leader; we will be the first to know when there is any danger."

As soon as the owl's talk is over, uproar starts again in the meeting. The banyan tree tries to calm everyone down clearing his throat but is in vain. In a frustrated voice, the banyan tree then begins to say to itself, "Stop it all! The tigers, the ants, the owls have all been talking so much for so long, none of them can even make their own food! They have to kill and eat other creatures. It's a little embarrassing to speak for ourselves, but I am to speak now. Like you all, we do not live by eating other creatures, but when we get a little sunlight, water and air, we make our own food. So, if there is a leader, then there should be someone from among the trees ..."

Before the banyan tree could finish speaking, all the creatures start shouting, "Autocratic decision! We don't accept it! We will not accept it!" There is a lot of noise and chaos in the meeting. Then the man stands up in fear and says, "If you allow me, I can say something."

The frog says, "Say quickly whatever you want."

The man says, "We humans do a job to select the leader. That is called election. The best will be if everyone chooses a leader with a secret ballot."

The lizard says, "All right!"

The frog says, "We want an election! Election!"

All the other animals say, "Yes, yes. We will decide our leader by election."

Then there is a great excitement about the election among living beings. Meetings, processions are all around. Pastors, festoons and banners have covered everything. No one can sleep at night at the sound of slogans.

One day the election was held with great fanfare. Waking up at night, everyone started counting the votes together. There is excitement inside everyone, who will be the winner? Who will be the leader of the living beings?

Once the vote counting is over. It is found that the winner is .....

(You can see the story doesn't end here. What will happen next? Who will win the election? And what will happen

then? You will decide what will happen in the next part of this story!)

Have you finished reading? Then you have known the first surprise! Yes, this story is unfinished; you will decide the end of the story! But before that, think of the characters in the story. As per your opinion, who will win the election? What kind of living being is he? What does he eat? Where does he live? Think and immediately write down your thoughts in the blank space below. If you don't know the answer to any question, don't worry, for now you can write by guessing. Check later whether your guess is correct-

Who will win the election?	
What kind of living being is he?	
What do you know about him? What does he eat or where does he live?	
Why do you think this character will win?	

The end of the story can be thought of later. Let's see if your thoughts match with your friends'. Let's talk a little about the story with the rest of the group.

Sessions Two, Three and Four

In the previous session, you talked about the story. Now let's take a closer look at all the characters in the story. Write down the main characters of the previous story and what kind of creatures (plants/ animals /microorganisms) below —

Name of the character	What kind of living being

Name of the character	What kind of living being

- Now let's know a little more about them. You have already read about the plants and animals part of the fourth chapter of your science book. Now have a look there again.
- Now we need to read the microorganism part of the same chapter. By microorganisms we promptly refer to viruses or bacteria, but you can't imagine how many kinds of microorganisms there are in nature. In this chapter you will find all the interesting information about them. Everyone in the group sit together and read these parts by yourselves, or if you don't understand, take the help of others. If someone in the group has problem understanding somewhere, you can help. And if it is more difficult to understand something anywhere, your teacher is there!
- You have learned a lot of information about animals, plants, microorganisms! But everyone in the story was arguing about who survives by eating what, who can make their own food - all of this. So, before you finish the story, it's important to study a little bit about how these different kinds of animals eat, isn't it? There is a detailed discussion on this subject in the thirteenth chapter 'Nutrition and Metabolism of Organisms' of your book. Let's read that chapter giving a bit more time! Teachers will help if there is any problem understanding somewhere.
- There has been a lot of study. Let's go back to the story. Everyone in the group discuss how the story can end. Talk about all the ideas that come to everyone's mind and draft the end of the story.
- The beginning of the story is the same but as each group has finished the story from their own ideas, in the end the story of each group will be completely different, won't it? Think how new stories have been written!
- Now the second surprise— How about doing a drama with the story? Talk about who will play which character in your group. This discussion can be done outside the class. Again, it is necessary that everyone in the group has to

act. Everyone will discuss but someone has to write the dialogues of the next part of the play. Again, someone has to design the clothes of those who will take part in different characters. Thinking about clothes? This is very easy! All you have to do is paint on the paper or use poster paper to draw or make all the characters and put them on the actors!

Remember, since many groups will perform, do not take too much time! Each group will stage a play of five to seven minutes, so get ready accordingly.

Session Five

Everyone must have come to school with a lot of preparation for the drama at home! In today's session, dramas of all the groups will be staged one by one. Write down what role you played in your team. Don't forget to write the names of not only actors, but also those who have done everything from writing dialogues to writing.

Names of group members	The role played in the group drama (Write with the name of the character played)

Retrospection

You have watched the dramas of all the groups. Which story do you like best? Why?

Whose performance was the most beautiful? Write down your feelings about today's event.

The World of Colour

As we open our eyes, we see the show of countless colours in this colourful world! But why do we see red rose as red, and why the green leaves are green? Again, why don't we see the colour in ordinary water, glass or air? Have you ever thought about that? This time your job is to solve all the mysteries of the colours of this colourful world!

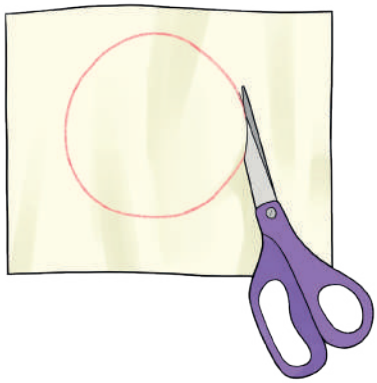
Session One

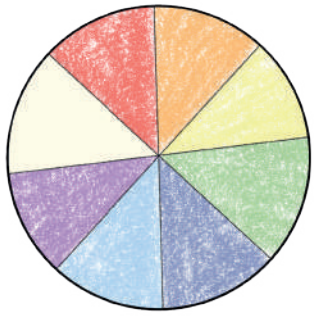
When we match the eyes, we see many colours are around us! The sky above the head looks blue in the morning, again in the evening the same sky becomes pinkish! Not only the sky, but also we see many trees, flowers, vines, leaves in the surrounding nature. Even if you look inside your classroom, you will see many colourful things, which you have never noticed before! But do you know a funny thing? There are probably some people in your class who look at the colours in a completely different way. When you say green, the color that comes in your eyes may be completely different in another person's eye! There are even many famous people in the world who have never seen some colours! The list ranges from the famous scientist John Dalton (in the upper class you can find out how important a scientist he was) to the famous writer Mark Twain, and even the founder of Facebook, Mark Zuckerberg! Most of them do not see the difference between red and green. Again, there are many of us who cannot see at all. But in many cases their other senses are sharper than those of ordinary sighted people.

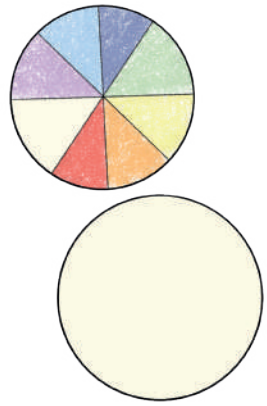
How about doing one thing? Find out what colours you have in the classroom, around the school, at home, on the way to school. With the help of pastel or colour pencil you can note down the colours by making small lines in the empty space below.

Talk to your friends; did they find any such colored things that you didn't notice? Now, notice the above colours well. Can you tell how many shades of colour there are in total? For example, there are many shades of green - yellowish green, olive green, dark green, bluish green. If you take a good look at all these colours, you will see that all the colours here are in fact different shades of a few colours. Can you distinguish the original colours? You discuss it with your friends too. One colour is mixed with another colour to create new colours. But what is the colour if all the colours we see are mixed into one?

Now let's try to understand the matter of colour better by doing an experiment. Scientist Newton was the first to perform this experiment. You can do this with a friend beside you. If you want, three friends can do it together.







- Draw a circle on a piece of paper as shown in the picture in the next page. Cut a piece of thin cardboard or a piece of sponge into circles in the same size.
- Now divide the paper into eight equal parts by drawing lines as shown in the picture. In the eight parts, paint these seven colours respectively - violet, indigo, blue, green, yellow, orange, red (you have got it right, the seven colours of the rainbow!). Leave the eighth part white.
- Now paste the paper on the piece of cardboard or sponge with glue. Right in the middle of it, that means near the center of the circle, make two holes side by side. Insert two thick strings through the holes and place the circle in the middle of the string like a colourful wheel.
- Now, it has to be spun very fast. How can that be done? One way is – spin the wheel while holding the string on both sides (almost the same way as the rope is spun in Jumping Rope). At a point of spinning, when the two strings are twisted many times, the hold the two ends of the

string tight. You will see that the wheel will continue to spin in the opposite direction at a high speed (if you want, you can also find out other ideas of spinning the wheel).

➲ Now notice, when the wheel of seven colours is spinning very fast, can all the colours be separated? If not, what colour can you see? Write down your observations below –

What colors do you see?

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What is the reason for this? Guess it?

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✎ Match your group's observations with those of other groups. What did they see? If the wheel spins fast enough, then the only colour you should see is white. But what is the reason for it?

✎ The small experiment that all these colours V-I-B-G-Y-O-R mix up and produce white colour has been done! This means that even if you see the light of the sun white during the day, there are many colours in it.

(One thing has to be mentioned here. If you try to mix these seven colours by rubbing with watercolor or pastel, you will get black instead of white. Can you say why? There is no problem you do not know the answer, keep the question. Think about it later.)

Well, think of a matter. Do you see any colour in the dark? Of course not, we see different colours when we are in the light only. That can be accepted, but why do we see the China Rose (joba flower) red and its leaf green? If you see a green leaf in red light, will you see the leaf green? Those who have seen the yellow light of the sodium lamp must have noticed that, at night, many of the colours in this yellow light look completely different. What does that mean? The colour we see on an object depends not only on that object, but also on the light in which we see that object.

Now let's do another experiment. If you want, you can do this experiment at home. But do not forget to discuss it with everyone the next day!

Take water in a glass or transparent polybag and mix a little red colour (water colour, food colour, or any colour that dissolves in water) in it and try to see what is on the other side through it. Do you see the original colour of different things on the other side of the glass, or does it look different? Try to see any green leaf through this red colour.
Write down your observations below-

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Have you seen green leaves green? If not, why? Discuss your explanation with friends and see what they think. To know more about this, read the paragraph 'Colours of Light' at the beginning of the chapter 'Light' in your science investigative study book.

Sessions Two and Three

There are many such things whose colour we don't see even in bright light. For example, water or air. Think yourselves why there is no colour of water? In the meantime, many may have guessed that the water has no colour, because the water is clear and all the colours go through it. So is glass. So, through the glass windows we can clearly see the colour of everything outside!

Now let's do a small task. Fill a glass fully with water and keep it at a place where the sunlight directly enters the house through an open window or door. Notice what is happening. Do you see the following events happening? Write down on the right side-

Possible events	Your observations
Sunlight is reflected from the surface of the water and falls on the roof of the house	
The sunlight has entered the glass through water	

Did your observations match with the above events? Leave the glass like this till the end of this session.

- You already know about the reflection of light. We only see the colour that is reflected in all the colours of light - we know it. Now let's discuss another context and that is the refraction of light.
- You have seen in the above experiment that light went straight through the glass of water. Now the question is, what actually happens during this 'going through inside'. Let's do another experiment - put a coin in an empty cup so that you can see the coin. As light goes in a straight line, it can be said that now the coin and your eyes are in a straight line. Now, move your head back slowly so that the coin is no longer visible.
- Now, keep pouring water on the cup. What's going on? Can you see the coin again? I don't think so. Doesn't it look like the coin has come up? How do you think it happened? After discussing with your friends, write down your guess-

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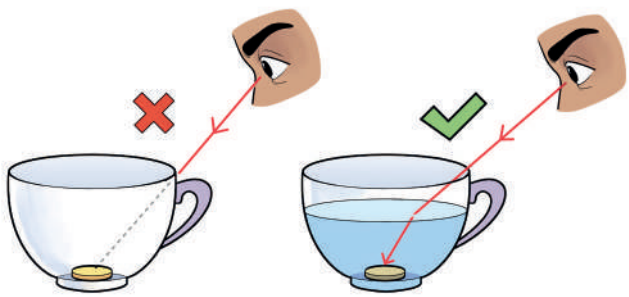
- According to science, the cause of the above incident is the refraction of light. A very interesting incident takes place during the refraction of light and that is the path of the light bends. Look at the picture beside. The coin is actually in its place. You can see it because the light has bended and is coming to your eyes.



- To know more details on when and how the refraction of light occurs, read the 'Reflection, Refraction and Absorption of Light' section from your investigative study book.
- Now let's give some food for thought! Did you notice that everything looks crooked when you look through high power glasses? Can you guess why it happens? Discuss among friends and write down your opinion-

Do you remember you left a glass of water in the sun a while ago? Now take the glass in hand and if it feels a little warm. Write down your observations on the right side-

Possible event	Your observation
After leaving the water in glass in the sun for a long time, it is seen that the water has become a little warm.	

You already know that in addition to reflection and refraction, water also absorbs light to some extent. Can you tell where this absorbed light went? Whatever you think is right! Light energy is converted into heat energy and makes the glass a little warm!

Session Four

We started the discussion about colour, so let's go back to it. When it comes to color, the word rainbow comes to our mind. After the rain, many of you must have seen the rainbow of seven colours curved like a bow in the sky!

There is a science comic about rainbows in your book. Together with a friend next to you, read the comic in the meantime. Don't forget to let everyone know how it felt!

After you finish reading, discuss with everyone in the class, including the teacher, how is the rainbow formed? Do the events of reflection and refraction have any role in creating a rainbow? Keep notes of your thoughts-

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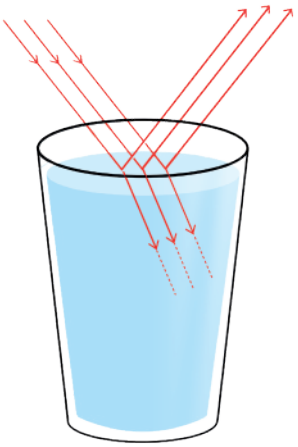

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- Like the boys and girls in the story, you are also scientists, aren't you? Now how about making a rainbow? You can make a rainbow if you want, just as it is said in the comic! Give it a try!
- Draw in the notebook how the rainbow made by you looks like. If you want, you can make it by cutting poster papers and sticking them with glue. In that case, you can cut the papers gradually thicker to thinner from violet to red and paste them so that even if you move your hand with your eyes closed, you can understand which one is which colour.

Conclusion

- In the first session of this learning experience, it was said that if you try to rub and mix the colours on the paper, all the colours will turn into a blackish colour instead of white. Many of you must have tried! But has anyone ever figured out why this happens? You will find the answer to this riddle in the 'How We See and Types of Colours' paragraph in the 'Light' chapter of your investigative study book.

Retrospection

- The reflection of light is a very familiar matter to us. We see our face in the mirror every day! One thing we have noticed all the time while looking at our own appearance in the mirror, is that the right and left in the reflected appearance always interchange. Have you ever wondered why this happens? Can you make a mirror where we can see that our right and left have not interchanged?

- The task is not difficult. As shown in the picture, place two mirrors are at a 90-degree angle. You will see that there is no inter change in your appearance. If you raise your right hand, the reflected appearance will also raise the right hand! Can you tell why it happens? Write down your explanation below-

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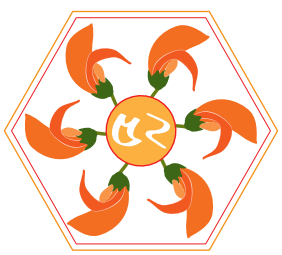


করোনাভাইরাসের (কোভিড-১৯) প্রাদুর্ভাব রোধে
জনসচেতনতা মূলক তথ্যাবলি
করোনাভাইরাস সংক্রমণের ঝুঁকি রোধে করণীয়
১
ঘন ঘন দুই হাত সাবান পানি দিয়ে কমপক্ষে ২০ সেকেন্ড যাবৎ পরিষ্কার করুন। প্রয়োজনে হ্যান্ড স্যানিটাইজার ব্যবহার করতে পারেন।
২
যেখানে সেখানে কফ ও থুতু ফেলবেন না। হাত দিয়ে নাক, মুখ ও চোখ স্পর্শ থেকে বিরত থাকুন।
৩
হাঁচি-কাশির সময়ে টিস্যু অথবা কাপড় দিয়ে বা বাহুর ভাঁজে নাক-মুখ ঢেকে ফেলুন। ব্যবহৃত টিস্যু ঢাকনামুক্ত ময়লার পাত্রে ফেলুন ও হাত পরিষ্কার করুন।
জ্বর
কাশি
শ্বাসকষ্ট
করোনাভাইরাস (কোভিড-১৯) এর লক্ষণসমূহ

Academic Year 2024
Class Six Science | Exercise Book

সমৃদ্ধ বাংলাদেশ গড়ে তোলার জন্য যোগ্যতা অর্জন করো

– মাননীয় প্রধানমন্ত্রী শেখ হাসিনা

মিতব্যয়ী হওয়া ভালো

তথ্য, সেবা ও সামাজিক সমস্যা প্রতিকারের জন্য **'৩৩৩'** কলসেন্টারে ফোন করুন

নারী ও শিশু নির্যাতনের ঘটনা ঘটলে প্রতিকার ও প্রতিরোধের জন্য ন্যাশনাল হেল্পলাইন সেন্টারে **১০৯** নম্বর-এ (টোল ফ্রি, ২৪ ঘণ্টা সার্ভিস) ফোন করুন

Ministry of Education

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