3

New Get Ahead

SCIENCE

Teaching Guide

Bazila Ahmed

Based on Revised Pakistan National Curriculum

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Introduction to the Guide

The Teaching Guides for the *New Get Ahead Science* series provide guidelines for help of the teacher in classroom. This Teaching Guide includes:

- An introduction on how to approach *New Get Ahead Science* in class.
- Teaching strategies mentioned in the national curriculum.
- Sample lesson plans.
- Suggested answers to the exercises in the textbook.
- Suggested worksheet for assessments.
- Suggested scheme of work.

How to Approach *New Get Ahead Science*

To teach *New Get Ahead Science* in a more constructive manner, teachers are advised to make classrooms more Student-centered. Students are to be given a more active role in the classroom, to be encouraged to present their thoughts and ideas confidently, and be instructed to respect differing opinions. In order to achieve this, teachers are to facilitate students so that they can take more responsibility for their learning journeys. The following summarizes the methodology with which all units of *New Get Ahead Science* are to be approached, in order to make classroom more Student-centered:

- Students to be given a chance to work independently, as well as collaboratively i.e. in groups. Real-life examples to be discussed by teachers and students.
- Students to be given tasks where they share opinions with each other and with the teacher. They are to be encouraged to give reasons for their opinions.
- Teacher to role-model the ideals of respect, collaboration, and active learning in the classroom. During group discussions, all students should be encouraged to work together.
- Teacher should facilitate students only when directions are needed; most of the time, students should work on their own while reading, writing, and discussing the lessons in specific units.

Contents and Sequence of the Teaching Guide

The Teaching Guide for *New Get Ahead Science* contains suggestions for starting a lesson and provide teaching strategies for each unit. The instructional model focuses on exploring background knowledge, where students participate actively.

Recommended Schedule for an Active and Student-centered Classroom

Exploring knowledge through essential questions	5 minutes
Teaching Methodology/Activity	25 minutes
Assessment	10 minutes

The first part of each unit contains basic suggestions for taking the lesson forward in a constructive manner. The second part of the lesson contains answers to all questions present in the book. Students should be advised to come up with their own answers and teachers can use the Teachers Guide to assess students' understanding and knowledge.

Teaching Strategies as per General Science National Curriculum

Examples of effective instructional strategies include, but are not limited to, the following:

- inquiry
- questioning and discussion
- investigation and problem solving
- demonstration and laboratory work
- problem based learning
- utilizing whole class, group, and individual work
- incorporating literacy strategies (reading, writing, speaking and listening)
- using student work to inform instruction

For detailed support on teaching strategies of Science, please visit Chapter 7 pages 55 to 64 in the General Science National Curriculum 2006.

Assessment Strategies as per General Science National Curriculum

Teachers learn about student progress not only through formal tests, examinations, and projects, but also through moment-by-moment observation of students. To assess students' science knowledge, skills, and attitudes, teachers require a variety of tools and approaches, such as:

- selected response
- constructed/ created response
- performance assessment
- personal communication
- students' self-assessment

For detailed support on assessment strategies of Science, please visit Chapter 8 pages 65 to 73 in the General Science National Curriculum 2006.

Division of Syllabus into Three Terms:

1st Term Unit 1 Living Things
Unit 2 Living Things: Plants
Unit 5 Matter

2nd Term Unit 3 Habitats and Adaptations
Unit 4 Our Body and Healthy Living
Unit 6 Water
Unit 7 Force

3rd Term Unit 8 Light
Unit 9 Heat
Unit 10 The Earth

Scheme of Work

Unit	Lesson No.	Topic wise allocation of periods	Learning outcome
Living and Non-living things	Lesson 1	2 periods	Learn about living and non-living things.
	Lesson 2	2 periods	Understand the basic needs of living things.
	Lesson 3	2 periods	Growth in living things and identify the young ones of animals.
	Lesson 4	2 periods	Learn how living things move.
Living things: Animals	Lesson 1	2 periods	Understand that there are different types of animals.
	Lesson 2	2 periods	Differentiate between wild and domestic animals.
	Lesson 3	2 periods	Learn the needs of animals and their homes.
Living things: Plants	Lesson 1	2 periods	Identify parts of the plants and what plants need.
	Lesson 2	3 periods	Compare leaves shape and sizes.
	Lesson 3	2 periods	Identify the different types of flowers.

Our Body and Healthy Living	Lesson 1	2 periods	Name the parts of the body and their functions.
	Lesson 2	2 periods	Learn about the sense organs and their use.
	Lesson 3	3 periods	Understand the importance of cleanliness and taking care of themselves.
	Lesson 4	1 periods	Recognize the importance of taking care of themselves and understand the importance of exercise.
Matter	Lesson 1	2 periods	Learn what matter is and identify the states of matter.
	Lesson 2	3 periods	Compare the properties of solid, liquid, and gas.
	Lesson 3	2 periods	Identify heavy and light objects.
Material	Lesson 1	2 periods	Learn and understand what material are.
	Lesson 2	2 periods	Identify natural materials.
	Lesson 3	2 periods	Identify man-made materials.
Heat	Lesson 1	3 periods	Learn the different sources of heat and uses of heat.
	Lesson 2	2 periods	Understand shade.
Light	Lesson 1	2 periods	Identify the sources of light and explain how humans see.
	Lesson 2	2 periods	Understand importance of heat and light.
The Earth and the Universe	Lesson 1	3 periods	Identify the differences in day and night. Understand how day and night occur. Differentiate four parts of the day.
	Lesson 2	2 periods	Relate seasonal weather conditions to appropriate choice for clothing.
	Lesson 3	3 periods	Naming the four seasons and illustrate the key characteristics of four seasons.

UNIT 1

Living Things

Lesson Plan 1

Student learning outcome

Identify the characteristics of living things.

Material

A chart showing living things and non-living things

Keywords

specific, gradual, breathe, oxygen, carbon dioxide, function, senses, reproduce, excrete, energy, survival

Overview

This lesson will provide students with an understanding of the basic characteristics of living things. It is these characteristics which show the difference between living and non-living things.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Is there any difference between a living and a non-living thing?
2. What do living things need to live?

Method

- Ask the students to breathe in deeply and then to breathe out. They will be asked what they had for breakfast. They will be told to stand near their desks and jump three times, wave their arms in the air three times, etc. Continue giving them instruction to move around, then ask them if the desk, chair or books could also follow the instructions given to them all? No. It will then be explained that living things have seven characteristics. The ability to breathe, eat, move, grow, senses, reproduce and to excrete.

- Activity 1 on page 2 will be conducted.
- Living things breathe in oxygen and give out carbon dioxide. Animals, plants, and human beings all breathe in order to live.
- Living things need food and water. Animals and humans do not make their own food. Green plants make their own food.
- Food gives us the energy to move, grow, and work. Where do plants get their energy from? Plants get their energy from the Sun. Humans eat plants and smaller animals to provide them energy. Animals eat plants or smaller animals to provide them with energy.
- Water is also needed for the digestion of food. Plants need water to make food and grow.
- Humans cannot live three minutes without oxygen, three days without water and three weeks without food. Animals and humans can move. Plant also move in specific conditions, towards water or sunlight.

Assessment

1. Activity 2, page 4
2. Exercise question 4, page 9

Reinforcement/homework

1. Write the seven characteristics of a living thing.
2. Answer the following questions.
   i. What do humans and animals breathe in and breathe out?
   ii. Do animals make their own food?
   iii. Why do plants need water?
   iv. Where do plants get their energy from?
   v. Where do humans get their energy from?
3. Exercise question 2, page 8

Lesson Plan 2

Student learning outcome

Comprehend that air, water, and food are essential for living things.

Material

pictures of different animals

Keywords

function, provides, energy, swim, digestion, survival

Overview

Air, water, and food are the basic requirement of all living things. Food provides the energy to do work. Air and water is used by plants to make food. Humans and animals eat plants to give them energy to do work.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential question

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What do you do when you are hungry?
2. When you are thirsty what do you do?

Method

- Begin the lesson by reading Student Book with the students. A living thing cannot survive without food, water, and air. All animals and humans breathe in air. Even plants use carbon dioxide in the air to make food. It also gets it energy from the Sunlight. It gives out oxygen which is used by the humans and animals.
- Do humans and animals make their own food? Humans and animals do not make their own food. They depend on the plants and other animals for their food. Food that the living things eat, provides them with the energy to work, move, and grow. Some animals have to hunt smaller animals for their food. Birds have to fly to look for food.
- Large part of the body of living things is made up of water. Living things need water in order to digest their food.
- Living things have senses. They can react to things happening within their bodies and also around them.
- Waste product in the bodies of a living things are excreted out of the body. Even plants excrete. Do activity 5 as described on page 5 of the Students' Book.

Assessment

1. Activity 6, page 6 to be done in class with the help of the teacher.

Object	Does it breathe?	Does it eat?	Does it move?	Does it reproduce?	Living/ Non-living thing
Butterfly					
Fan					
Plant					
Bird					
Cup					

Reinforcement /homework

Answer the following questions.

i. What are the three things all living thing need?
ii. Do plants make their own food?
iii. Where do plants get their energy from?
iv. Does water help in the digestion of food?
v. Do plants need water to make food and grow?

Lesson Plan 3

Student learning outcome

Learn about the life cycle of living organisms.

Material

Pictures of animals and their young ones, trees and young plants. Chart showing the life cycle of a hen.

Keywords

nestlings, butterflies, parents, kittens

Overview

This lesson will explain animals give birth to young ones or as eggs which resemble them. An insect lays eggs, but the eggs first grow into larvae. The larvae grows and begins to look like the adult insect.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Name some animals and their young ones.
2 Do all young ones of animals like their parents?

Method

- Some animals like birds, snakes, and fish lay eggs. Explain the life cycle of a butterfly and the frog. After a period of time, a young animal comes out of the egg. The young of frogs and butterflies do not look like their parents when they come out of the egg. Do kittens look like a cat? Yes, they look like the mother cat.
- The young of animals are looked after by their parents. Have you seen cats or dogs feeding their young? Some animals are fed milk by the mother animal. Birds also feed their nestlings. Can you name some animals which feed their young ones? Cat, lion, dog.
- Some young ones cannot move when they are born and so need to be looked after by their parents. Kittens and puppies are good examples. The young ones are protected by their parents too.

Assessment

Exercise question 3, page 9

Reinforcement /homework

1. Answer the following questions.
   i. Name 3 animals that lay eggs.
   ii. Do baby butterflies look like their parents when they come out of the egg?
   iii. Who feeds the baby animals?
   iv. How does a sparrow feed its nestling?
   v. Can a human baby move by its self?
2. Exercise question 1, page 8

Living Things – Plants

Lesson Plan 1

Students Learning Outcome

Identify the function of different parts of the plants.

Material

An intact plant with all its parts. A chart showing parts of the plant.

Keywords

minerals, transport, reproduce, functions, structure

Overview

The students in this lesson, will learn about the different parts of the plants and their functions. Show them a plant and point out the main parts. Then elaborate on each part.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Where does the plant gets it food from?
2. What are the four things that a plant need to grow?

Method

- Place two potted plants in the classroom. One which has been watered daily and the other which has not been watered for a few days. The students should be directed to place a few bricks on a patch of grass in the school ground.
- Begin lesson on plant by reading pages 10 and 11 of the Students' Book.
- Ask the students why is one plant looking fresh while the other is looking dull? One plant has not been watered for a few days. The students will be taken outside to the school ground. The brick will be moved to see the grass, it showed have turned yellow or begun to get discoloured. The grass did not get sunlight. The teacher will now explain that plants need air, water, and sunlight to make food.

- Conduct activities 1, 2, and 3 on page 10.
- Plants have two main parts, the roots and the shoots. The roots grow underground and they hold the plant firmly in the ground. They absorb water and minerals from the soil and sends it to the stem. Sometimes they also store the food made by the plant.
- The shoot is the part of the plant which grows above the ground. The flowers, fruit, seeds, and leaf are part of the shoot.
- Flowers make seeds from which new plants grow. They attract the insects like the butterfly.
- Fruits are the fleshy part of the plant it protects the seeds.
- The seeds grow into a new plant, as it contains its own nutrients.
- A Leaf grows on the stem. They are of different shapes and sizes. The leaf helps the plant to make food.

Assessment

1. Activity 4, page 12
2. Activities 5 and 6, page 13

Part	carrot	Tomato	Onion	potato	lettuce	mango	pea	rose
root	*							
stem			*	*				
leaf					*			
fruit		*				*	*	
flower								*

Exercise question 3, page 15

Lesson Plan 2

Student learning outcome

Define and explain photosynthesis. Explain why plants need water, carbon dioxide, sunlight, and chlorophyll.

Material

a potted plant, a chart showing the process photosynthesis

Keywords

chlorophyll, substance, absorbs, glucose, released, organism

Overview

Students already have knowledge of how a new plant grows. In this lesson, they will learn about the process of photosynthesis, by which a plant is able to make food with the help of water, air, and sunlight.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What do plants need to make food?
2. Which part of the plant makes the food?

Method

- Make the students recall as to what had happened to the grass on which the bricks had been placed. The grass was no longer green. Now explain that the grass did not get sunlight, so it was unable to make food for itself.
- The green substance in the leaves is known as chlorophyll. This green substance absorbs sunlight, carbon dioxide from the air, and water from the roots to make food. This food is known as glucose.
- During this process, oxygen is also given out. Oxygen is also used by other living things. This process will be explained with the help of charts showing photosynthesis.

Assessment

Activity 7, page 14

Reinforcement /Homework

1. Draw the diagram on page 14, showing the process of photosynthesis.
2. Exercise questions 1 and 2, page 15

UNIT 3

Habitats and Adaptations

Lesson plan 1

Student learning outcome

Define a habitat as a place where people, animal, and plants live. Differentiate between different habitats like forest, desert, and rivers.

Material

Charts showing the different kinds of habitats—plants and animals particular to those regions.

Keywords

habitat, provide, environment, organism, survive, amphibians, protection, retain, inhabited

Overview

This lesson will explain to the students what a Habitat is. It is a home to different kinds of plants and wildlife. They will also be introduced to three natural habitats-desert, forest, oceans.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Do animals need anything special in order to survive?
2. Where do following animals live? Bear, fish, deer, snakes, camel, lions, frogs

Method

- Begin the lesson by dividing the board under different habitats-desert, forest, and rivers/lakes/ponds. Distribute one card to each student with either the name of an animal or plant written on it. Each student will be called to come to the board and write the name of the animal or plant in the correct column. It will then be explained that a habitat is a place where living things find all their necessities required to grow and reproduce.

- A fish cannot live on land and similarly, a lion or a bear cannot live in the desert or the ocean.
- A desert is hot, dry and sandy. What kind of plants are found there? There is very little vegetation, only cactus plants which have thick stems to store water survive in the desert. Which animal can survive in the desert? A camel can survive in the desert because it has a hump on its back to store water, flat feet which helps it to walk in the sand. The other animals found there are desert cats and snakes.
- What is the forest area covered with? The forest is a large area covered with many different kinds of trees, which provide homes to many kinds of animals and birds. Name the animals which make the forest their home? The forest is home to tigers, bears, monkeys, birds like the hawk and the hummingbird.
- The rivers/lakes are the habitats for fishes and water plants. The man-made ponds provide a home to frogs, ducks, and insect like the dragonflies, and mosquitoes. Water lily and weeds are also found here. Fishes feed on the insects and weed. Therefore, a habitat includes both, plants and animals.
- There are some animals that live both on land and water, like the frogs and crocodiles. They are known as amphibians.

Assessment

1. Activity 1, page 18
2. Activity 3, page 20
3. Exercise question 2, page 28

Reinforcement /homework

Answer the following questions.

i. What do habitats contain?
ii. What is a habitat?
iii. What is the habitat of an amphibian?
iv. Can you name things in your school habitat?
v. Name some animals which live on land and in water.

Lesson plan 2

Students learning outcomes

Differentiate between different habitats like rivers, grassland, and polar region.

Material

Chart about three different habitats.

Keywords

prawns, crabs, turtles, grassland, grazing, giraffes, zebras, ostriches, polar bears, penguins

Overview

This lesson will discuss the habitats of sea, grasslands, and the Polar Regions. The students will see the vast difference in these habitats, and how the plants and animals survive there.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Where do you could find polar bears?
2. What is a grassland?

Method

- Continue the previous lesson. The students will be told that there are three other kinds of habitat—sea, grassland, and the Polar Regions.
- The seas also have a large number of small and big fishes, turtles, crabs, and prawns. Many kinds of plants grow under the sea, together these plants and animals make the environment of the sea. How do the fishes survive in the sea? The small fishes eat plants, and the big fishes eat the small fishes. Is the sea deep? The sea is very deep in some place, even sunlight cannot enter there.
- What covers one fourth of the land on Earth? One fourth of the land on Earth is covered by grassland. Grassland are open space and do not have many trees but tall grass and bushes. What kind of animals can survive in grassland? It is suitable for animals that eat grass, the giraffe, zebras, and ostriches.
- Where are the Polar Regions? Polar Regions are situated at the North and South Pole of the Earth. What are the Polar Regions covered with? They are covered with snow throughout the year. No plants can grow there. How do the animals survive there? Polar bears and penguins survive there by eating fish.

Assessment

Activity 4, page 22

Reinforcement/homework

1. Answer the following questions.
    i. Does the grassland have large shady trees?
    ii. Which animals find their homes there?
    iii. Name the various animals found in the seas.
    iv. What do the small fishes eat?
    v. What areas of the Earth are known as the Polar Regions?
    vi. How do the penguins and the polar bear survive in the Polar Regions?
2. Exercise questions 1 and 4, page 28

Lesson plan 3

Student learning outcome

Identify the ways plants and animals adapt to their habitats.

Materials

pictures of camel, tiger, penguin, monkey, parrot, chameleon, cactus plant

Keywords

adaptation, particular, nostrils, prey, fur, protect, camouflage, chameleon

Overview

This lesson will explain to the students that animals come in different sizes and colours for a reason, in order for an animal to survive in its habitat. A parrot is green in colour, so that it can hide in the trees, a chameleon changes its colour, the monkey with its long tail swing in the trees.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How do animals protect themselves?
2. What is adaptation?

Method

- Ask the students: Why do parrot have green feather? Why is the Polar bear white? Why do monkeys have long tails? The answer to all these questions is that these characteristics help these animals to adapt to their surroundings or habitats. The polar bears' habitat is covered with snow throughout the year, so it fits into the environment. The parrot lives in the trees, so it can hide from predators. The monkey has a long tail to swing from branches of the trees. Camels have long eyelashes to protect the eyes in a sandstorm, it also has flat feet to walk in the sand, and its nostrils close in a sandstorm. Lions and Tigers have strong teeth which help them to kill other animals and strong legs, which helps them to run fast to hunt.
- Some animals also blend in their habitat by changing their colour. This is called camouflage.
- Trees that grow in cold areas shed their leaves in winter. The cactus plants in the desert have thick stems and branches to store water and thorns instead of leaves. They have deep roots which search for underground water. The lotus plant has hollow roots which help the lotus plant to float on water.

Assessment

1. Activity 5 and 6, page 24
2. Activity 7, page 26
3. Exercise question 4, page 28

Reinforcement /homework

1. Answer the following questions.
   i. Why does the camel have a hump on his back?
   ii. How do animals protect themselves from the cold in the Polar Regions?
   iii. Why do parrots have green feathers?
   iv. Why does the lotus plant have hollow roots?
   v. Why do ducks have webbed feet?
2. Use an A4 size paper to draw a picture of any one habitat. Show at least one kind of animal and the plants that can be found there. Colour the picture.

Lesson plan 4

Student learning outcome

Describe the effects of human activity on their habitats.

Materials

pictures of different kinds of pollution

Keywords

responsible, danger, pollution, chemicals, decreases, population

Overview

Humans have been exploiting the Earth, without taking care of the other living things existing there. Forests have been flattened to make farmland, homes and factories, while making the wildlife and plants extinct. Water and air, both have been polluted to an extent that ways of improving them are being discussed and debated.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How is pollution caused?
2. How can pollution be decreased?

Method

- Begin by asking students, what is the cause of pollution? Relate their answers to human activity. We have not taken care of the water, soil, or the air. This has put not only the animals and plants but the human life into danger. Read aloud page 27 of Students' Book in the classroom.
- The hunting of birds and animals also affects the population of animals in that particular habitat.
- Trees in the forests are cut to make farms, factories and houses. The cutting of trees in dense forests, make the animals homeless as they lose their habitat.
- The industries which use water for production of their products, the untreated water flows into the rivers. The harmful chemicals have put the lives of humans and animals in danger.
- Plant life is polluted by the water used to grow it, which is itself polluted by chemicals from industries or by the fertilizer used to grow crops. Another source of pollution of plant life are the pesticides used to protect plants from insects.
- The atmosphere in the cities is polluted with the smoke from factories and transport that we use.

Assessment

Exercise question 3, page 28

Reinforcement/homework

1. Draw a poster on an A4 sheet illustrating how we are polluting our environment and what we should do to eliminate it.
2. Ask the students to write a few lines on the effects of pollution on our environments in their notebooks.

Our body and Healthy Living

Lesson Plan 1

Student learning outcome

Identifying the sensory organs of our body.

Material

different object to feel and smell, bell, alarm clock

Keywords

sensory, organs, whisper, aeroplane, yelling, recognize

Overview

In this lesson, the importance of the five senses will be reinforced. Students will also learn how these sensory organs, help the humans in their everyday life.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What helps you to see?
2. What helps you to hear?

Method

- The students will be asked to name the sensory organs and their functions. E.g. eyes help us to see and recognize colours. The nose helps us to smell—good and bad. The ears help us to hear loud and soft sounds. The tongue helps us to taste things which are sweet, sour, or bitter. The skin helps us in feeling whether things are hot or cold.

Assessment

1. Activity 1, page 29
2. Activity 2, 3, 4, page 30
3. Activity 5 and 6, page 31

4. Activity 7, page 32 (to be done under teacher supervision)
5. Activity 8, page 32

Reinforcement /homework

1. Exercise questions 3 and 5, page 38
2. Exercise questions 1 and 2, page 38

Lesson plan 2

Student learning outcome

Explain that food provides us with energy. Classify food into basic food groups.

Materials

Students will be asked to bring picture of food they like to eat. Pictures of fruits and vegetables. Chart paper. Paper plates.

Keywords

nutrition, proteins, carbohydrates, vitamins, minerals, fibre

Overview

Students already know that food is the main source of energy for the growth and strength of human beings. Emphasis will be laid on the importance of eating healthy foods. These healthy foods can be arranged into food groups, which will help them choose their choice of food judiciously.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What do you think by meant by good food?
2. Do you think good food is also healthy food?

Method

- Ask all the students to put the pictures of food that they like, and of fruits and vegetables on their desk. The students will be given two paper plates. Each student has to pick the food they like from the pictures they have brought and put on their paper plate. Once the students are done, the teacher will begin discussion. Is eating a

burger, French fries, chip, biscuits, cold drinks healthy food? No because eating such food every day is not healthy for our body.

- Our body is like a machine, it needs the food to work and other activities. The food that we eat must include the following nutrients: Proteins, Carbohydrates, Fats, Vitamins, Minerals, Fibre, and Water. These nutritions are found in meat, grains, fruits, and vegetables. It is important to eat meals using all the food groups to stay healthy.
- Read pages 33 to 37 of Students' Book in the classroom.
- Food rich in proteins are called Food for Growth—eggs, meat, pulses, fish, milk
- Foods rich in carbohydrates are called Food for Energy—bread, potatoes, sugar, rice
- Foods rich in fats are called Food for Warmth and Energy—cheese, butter, oil, ghee
- Foods rich in vitamins, minerals, and fibre are called Food for Health—banana, okra, eggplant, apple, tomato, onion.

Assessment

1. Activity 9, page 35
2. Exercise question 7, page 39

Reinforcement/homework

1. Answer the following questions.
    1. What is the name given to food for growth?
    2. Name some foods which are known as carbohydrates
    3. Why are foods rich in fats not considered to be healthy?
    4. Is it important to have more food for health?
2. Make a small booklet with A4 sheets. On each page note down what you ate the whole day, from breakfast to dinner. Note down the snacks you had in school and in between meals. Do this for a week. At the end of the week check were you eating healthy food or unhealthy food. Count and write in the end what you should do to check yourself, in case if you are eating too much of unhealthy foods.

Lesson Plan 3

Student learning outcome

Recognize the importance of eating a balanced diet. Identify about different types of teeth.

Materials

paper plates, colour pencil

Keywords

balanced, important, molar, pre-molars, incisors, digestion

Overview

In this lesson, the students will learn why a proper diet is important for good health. They will also learn the need of taking care of their teeth.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What is important a balanced diet or junk food?
2. What helps us to digest food?

Method

- Ask the students to open the Students' Book to page 36. The students are to make a healthy plate of food from the given table. They can draw the food they like or paste pictures of the food. The plates can be then displayed in class. The students will then understand the role of each food group in a healthy diet. It is important that we eat one or two items from each group. Unhealthy foods are those with too much oil, sugar and other fats. These foods make you overweight and unhealthy.
- Our teeth are very important for good digestion, as they are the first step in the proper digestion of food. We must take care of them. The incisors are sharp teeth used for biting and cutting the food. The canines, help in gripping the food. The molars and premolars are used to crushing and chewing the food. Brush your teeth twice a day. If you have something sweet, wash your mouth after eating it, or avoid drinking or eating it.

Assessment

1. Activity 10, page 37
2. Exercise question 8, page 40

Reinforcement /homework

1. Draw the diagram of teeth given on Students' Book page 37, in your notebooks.
2. Write five sentences on why we should keep our teeth healthy.
3. Exercise question 6, page 39

Lesson plan 1

Student learning outcome

Comprehend that matter is anything that takes up space and has weight. Identify the three states of matter.

Materials

a book, pencil, chair, a glass with water, a thermos with hot water, balloon, two beakers, some pebbles, an inflatable ball

Keywords

states, matter, solid, liquid, properties,

Overview

This lesson will develop a clear understanding of what matter is. It will also explain that matter is found in the three states all around us. All matter has weight and occupies space.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Name some solids things in the classroom.
2. Do you think you have noted everything?

Method

- Read page 41 of the Student Book with the students. Now review all the things that the students noticed were solid. They may have missed something.
- Everything around us is in three forms. Solid, liquid and gas. All these three forms have weight. Solid have a fixed shape as an object, whereas liquid and gas takes the shape of the container.

- The glass of water will be emptied on a plate, or on the floor and the shape change observed.
- Ask a student to the front of the classroom and asked to blow up the balloon. The balloon which was flat, gets turned into a ball. Air getting filled into the balloon, changes its shape.
- Matter is found in three forms solid, liquid and gas. Matter has weight and takes up space. Some matter is light and some heavy.

Assessment

1. Activity 1, page 42
2. Activity 2, page 42 (to be done under the supervision of the teacher)
3. Activity 3, page 43 (to be done under the supervision of the teacher)

Reinforcement /homework

1. Instruct the students to make a list of solid things in the classroom in their notebooks.
2. Exercise question 2, page 46

Lesson 2

Student learning outcome

Identify the difference between solids, liquids, and gases.

Material

different shapes of solids, a bottle of cold drink, a glass of water, a packet of juice, balloons of different sizes

Keywords

volume, fixed, bend, stretch, twist, measured, beakers, cylinders, observe, poured

Overview

The students will learn that all matter has weight and occupies space. But there is a difference in the three states, solids have a fixed shape, liquids and air can take the shape of a container.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Do all desk in the classroom have the same shape?
2. Do water and air keep their shape?

Method

- Remind the students, that they already know solids have a definite shape and weight. Does liquid have weight and shape? Liquid also has weight and can take the shape of the container it is in. Gas also has weight and takes the shape of the container.
- Read page 43 and 44 of Students' Book in the classroom.
- A solid has a fixed volume, and may break if dropped. You can also change its shape by applying force. Solid can be soft as wool, hard as iron or wood, and small as rice or large as a building.
- A Liquid can be poured and can flow. It has a volume but no fixed shape. The bottle of cold drink, the packet of juice and the glass of water can all be poured into similar shaped glasses. Liquids can be measured using a measuring cup.
- We cannot see gas, but it is all around us. It does not have a shape or size of its own. Air is around us and we feel it when the wind blows. Gas also takes the shape of the container. The balloon filled up with air is an example.

Assessment

1. Activity 5 and 6, page 45 (to be done under the supervision of the teacher)
2. Activity 7 and 8, page 45

Reinforcement /homework

Exercise questions 1 and 3, page 46

UNIT 6

Water

Lesson plan 1

Student learning outcome

Identify the sources of water. Explain that all life forms need water for their existence.

Materials

picture of the different sources of water and living things.

Keywords

organisms, bathing, drinking, cooking, increasing, household, impurities, suspended, particles, dissolved, dissolved

Overview

Students already have an idea about the importance and use of water in our daily life. In this lesson, emphasis will be laid on where our water comes from, and how we use it.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How do we keep ourselves clean?
2. When we are thirsty what do we do?

Method

- Water is one of the most important liquids on Earth. All living things will not be able to survive without water. We use water in many different ways. Can you all name them? Drinking, cooking, washing, and bathing.
- Plants also need water to grow. Many factories and industries also need water. As the population on Earth is increasing, there is a large increase in the demand for water.
- Water is found naturally in three states, solid, liquid, and gas. Where do we get water from? We get water from different sources. Rain is the pure form of water, as it contains the least amount of impurities. Well water and pond water have dissolved

minerals. River water is a mix of melted snow and rain. Seawater cannot be used for drinking as it has a lot of salt.

Assessment

Exercise questions 2, 3 and 4, page 51

Reinforcement /homework

Answer the following questions.

i. What is one of the most important liquids on Earth?
ii. Do all living things need water?
iii. Is water found in all three states of matter? Name them.
iv. Name the liquid which can dissolve many things
v. Which is the purest form of water?
vi. Why can we not use sea water?
vii. What does pond and well water contain

Lesson plan 2

Student learning outcome

Explaining the water cycle with the help of the four stages involved in it. List the uses of water.

Material

Chart showing the Water Cycle.

Keywords

evaporation, condensation, precipitation, raindrops,

Overview

The students understand the importance of water in our life. In this lesson, they will learn about the Water cycle, and the terms related to the different stages.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How do we get water on Earth?
2. Where does the water that falls on the Earth go?

Method

- Read page 48 of the Students' Book in the classroom. Explain that water comes down to the Earth, in the form of rain and snow. Some of this falling water runs into rivers and streams. Some of this water is absorbed into the ground and used by the roots of the plants. Water from the rivers flows into the seas. Water is not created but it is naturally recycled for use. The water from the land goes into the air and falls back as rain.
- The first stage of the Water Cycle is known as Evaporation. The heat of the Sun turns water from the seas, rivers, lakes, and melted snow into water vapour.
- The water vapours then cool down and turns back into water. This stage of is called Condensation. Clouds are formed by these water vapours.
- The clouds in higher altitudes change the water into snow and when the clouds become heavy they fall as snow or rain. This stage is called Precipitation. Rain water falls on the Earth and fills up rivers, lakes and is absorbed in the ground.
- How do we use water every day? Water has many other uses besides drinking and washing. We put water in our gardens to help the plants grow. The ships and boats use the sea for travelling. We use water for firefighting. Water can be used to dissolve many solids.
- Discuss with the class about how we can save water. We have to conserve water. We must not leave the taps running Leaks in water pipes should be repaired quickly. Always keep water covered to protect it from impurities. Have a bath using the water in a bucket.

Assessment

1. Activity 1, page 50
2. Draw the water cycle on page 48, in your note copy.
3. Exercise question 6, page 51

Reinforcement/homework

1. Answer the following questions.
   i. What are the three stages of the water cycle?
   ii. What is evaporation?
   iii. How are clouds made?
   iv. What is precipitation?
   v. What happens to the rain water which falls on the ground?
2. Exercise question 1, page 51

Lesson plan 1

Student learning outcome

Comprehend what force is and conceptualise its role in the movement of object. Understand the importance of force of wind and water.

Material

a car, a small box, a pencil case, a school bag, a water bottle

Keywords

objects, muscles, machines, energy, generate, electricity

Overview

This lesson will reinforce the concept of force. Force just does not mean a push and a pull but force can cause movement of an object. Introduce the students that wind and water also exert force which is used in many ways.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Can we push or pull something?
2. What are we doing when we push a door closed or pull it open?

Method

- Read page 52 of Students' Book in the classroom. Explain when you push or pull an object, force is applied to move the object. Force is needed to move an object from its original position, move an object or to stop a moving object. A push and pull changes, or tends to change, the position of an object. While playing tug of war both the teams are pulling the rope towards their side and the team which is stronger wins the game.

- If a car breaks down, we have to push the car to start it. The students will give examples from the games they play in the playground. Cricket, football, tennis, are games in which players push the ball to make it move.
- You need force to push a heavy object. Animals also pull carts loaded with heavy objects.
- Water and wind are also used as a force. They can be used to move objects as humans and animals do. A large windmill is used to move turbines to produce electricity. Kites also require the force of the wind to fly. If the wind is blowing hard, it will be easier to fly the kite.
- Moving water has a lot of energy to move ships and boats on rivers and seas. The raging river during floods has enough destructive power to break houses and destroy properties and farmlands. This energy is known as hydropower and used in hydroelectric power stations.

Assessment

Activity 3 and 4, page 54. This can be done by providing A4 sheets to the students.

Reinforcement/ homework

Ask the students to draw 2 pushes and 2 pulls in the table below. Tell them to identify which push/pull they commonly use during the school day. Label each picture with either push or pull.

1.	2.
3.	4.

Lesson plan 2

Student learning outcome

Describe the force of friction.

Material

desk, chair, toy car, roller skates or a tea trolley with wheels

Keywords

friction, polished, smooth, rough, surface

Overview

In this lesson, the students will learn about friction. Friction is a force which stops a movement of an object. They will further learn that friction is everywhere. Friction is opposite to force.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Do things move more easily on a smooth surface or a rough surface?
2. Will you be able to stop quickly on your roller skates?

Method

- Read Page 55 of Students' Book in the classroom. Friction is the force which is opposite to force. Ask a student to take a toy car and push it on the floor. It goes a short way and then stops. Why did the car stop? The car stopped because the force of friction had acted on it. Now take a small box, or your school bag. Do these things roll easily on the floor? This is because of friction. The box and the bag do not have wheels and the floor was not smooth. Can you slide in the school ground? What about the school corridors? The ground is not smooth while the corridors have smooth floors. Again it is due to the presence of friction.
- Friction helps us to walk. Our shoes help to grip the floor or ground. The match stick is struck against the rough side of the matchbox to light it up. The roads are slightly rough to make the cars move easily. What happens when it rains and the roads become slippery? The cars begin to slip and slide on the roads, as there is no grip. Friction helps us to walk, run and hold things.

Assessment

1. Activity 5, 6 and 7, page 55 (to be done under supervision of the teacher)
2. Exercise question 1, page 59

Reinforcement /homework

1. Write three different ways in which friction help us in our daily life.
2. Exercise question 2, page 59

Lesson Plan 3

Student learning outcomes

Describe the useful and harmful effects of friction. Explain how simple machines make work easier. Name and recognise simple machines used in their surroundings.

Material

spoon, knife, scissors

Keywords

resistance, direction, applied, reduced

Overview

In this lesson, the students will learn how friction helps us in walking, and in stopping car tires from slipping in the rain. Friction is also harmful when it slows down the movement of a machine.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Why do our shoes wear out?
2. Why do car tires wear out?

Method

- Read pages 56 and 57 of Students' Book in the classroom. When something is used for some time, it wears out. In a machine, the moving parts are constantly rubbed against each other, friction slows down the efficiency of the machine. In order to

keep the machine in a good working condition, it should be oiled regularly. Shoes and tires also have to be replaced after some time of constant use.

- Machines make work easier. Machines can also be used to change the direction of the force applied. A pulley is a simple machine which makes it easy to lift heavy loads. The bicycle is also another example of a simple machine, it shortens the time needed to walk that distance. Scissors, knife and spoon are good examples of simple machines.

Assessment

Exercise questions 3 and 4, page 60

Reinforcement/homework

Answer the following questions.

i. Name and draw 3 simple machines we use daily.

ii. Do shoes provide friction or force?

iii. How do we remove friction in machines?

iv. Take a ball roll it on a rough surface and then roll it on a smooth surface. Write down your observations in your notebooks.

v. Why do car accidents take place, when it rains?

UNIT 8

Light

Lesson Plan 1

Student learning outcome

Discuss the importance of light. Understand how light travels. Comprehend concepts about how they are able to see.

Material

A-4 sheets, a torch, three square cards

Keywords

energy, particles, straight, opaque, transparent, translucent

Overview

The sunlight during the day and man-made light during the night enables us to see. Light is used by the plants to make their food. The students will also learn about transparent, translucent, and opaque objects.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How are you able to see in the dark?
2. Do plants need light to make food?

Method

- Read the page 61 of the Students' Book in the classroom. We can only see in the presence of light. When light falls on an object, it gets turned back (reflected), and then travels to our eyes. This is the reason why we are unable to see anything in the dark. The sun provides us with light during the day. We have electric bulbs to give us light at night. Plants use the light energy to make food. Light also provides us with heat.

- Have you seen the rays of light from a car? They are always straight. The car light rays can be seen because of the dust particles in the air. Sunlight that falls on Earth is always straight. That is why light cannot pass through an opaque object. Light passes through a transparent object and slightly through a translucent object.
- Conduct Activity 1, page 62 in the classroom. The teacher will hand out one A-4 size paper to each student. She will now divide them into pairs. Each student has to roll the paper into a tube. One student will look through the rolled paper tube, while the other will hold a pencil in front of the roll. Can they see the pencil? Or will they will bend the roll and try to see the pencil? Can they see it better if they bend the rolled paper tube? No, because the light travels in a straight line. Light cannot bend.
- Conduct Activity 2, page 62 in the classroom. The teacher will take three cards. She will punch a hole in the centre of each card. The three cards will be made to stand in a row. The students will see that light passes through the holes in the cards. Now the centre card will be moved. Can you see through? No. Light travels in a straight line. If we are near a light source, it is bright. If we are further away from light it is dim.
- If light passes through an object it is transparent. Can you name objects that are transparent. We can see through glass, clear water, air, thin clear sheet of plastic.
- Opaque material does not allow light to pass through it. Name some opaque materials. Metal, card paper, and wood are opaque materials.
- Translucent materials are those through which some light passes through. Tissue paper, plastic bowls and frosted glass.

Assessment

Exercise question 1, page 67

Reinforcement /homework

Make a list of 4 objects which are transparent and 4 things which are opaque. Draw them in your notebooks.

Lesson plan 2

Student learning outcome

Explain how shadows are formed. Identify the importance of light and heat for living things. Find directions with the help of the Sun.

Material

a torch, small objects, chart showing a picture of a healthy tree and a sickly tree

Keywords

sundial, warmth, presence, north, south, east, west

Overview

Students are already aware of the Sun is a major source of light. Plant use light and heat in order to grow and to make food for themselves. Light travels in a straight line. Students will learn about the sundial, and finding directions with the help of the Sun.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. What follows you around when you play in the sunlight?
2. Can heat help plants?

Method

- Read page 63 of the Students' Book in the classroom. Remind students that light travels in a straight line. That is why an image is formed of the object which has blocked the rays of light. This image is a shadow. Darken the room and with the help of an object and a torch, a shadow can be formed. The shadow is always on the opposite side of the light source.
- The shadows change direction during the day. It looks as if the sun is moving, but actually it is the Earth's rotation on its axis which changes the direction. In the morning the shadow is long, whereas in the afternoon the sun is directly overhead so the shadow is short. In the evening, the shadow is long.
- Opaque objects form good shadows. Transparent objects do not make a shadow. Translucent objects do not make clear sharp shadows. The teacher will use the torch on transparent objects and translucent objects to show the difference.
- In olden days people used the Sundial to see the time. The Sundial could not be moved.
- Direction can also be found out by the help of the Sun. If we face the east the north is on your right, south on your left and west behind you.
- Plants make their food in the presence of sunlight. The leaves of the plants fall as the plant is unable to make food in winter, due to lack of proper light and heat. In the summer, the plants are healthy and they grow due to the sunlight and heat. Most animals in cold countries sleep during the winter months, in order to keep themselves warm.

Assessment

1. Activity 3, page 64
2. Activity 4, page 64
3. Take two potted plants, place one plant on a window sill which gets the Sun. Place the second plant inside the room where the sunlight does not reach it. Water both plants daily. Make an observation sheet. Which planted turned weak and limp.

Day	Plant No 1	Plant No 2
1		
2		
3		
4		
5		
6		

Reinforcement/homework

1. Draw a picture of a sundial in your notebooks.
2. Write a few lines on why light and heat are important for plants and animals.
3. Exercise 3, page 67

UNIT 9

Heat

Lesson plan 1

Student learning outcome

Describing heat as a type of energy. Explain that heat changes the state of matter.

Material

a thermos of hot water, a bowl of ice, cups, a candle

Keywords

useful, steam engines

Overview

Students will be explained that energy is the ability to do work. Heat is also a kind of energy, as it has the ability to change the states of matter.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How does it feel to touch something, which has been kept in the sun for a long time?
2. How does ice feel like when you touch it?

Method

- Put some hot water from the thermos into a cup. Students will be called to carefully touch the cup with hot water. What did it feel like? Hot. Now students will be called to touch the bowl of ice. What does the bowl feel like? It feels cold. Put your hand near a burning candle, does it feel hot or cold. Hot. Put a spoon or a metal scale in the hot water cup. Was it hot or cold when you took it out? It was hot.
- Read page 68 and 69 of the Students' Book in the classroom.
- Explain to the students that we get heat from the sun in the day. We also get heat from burning wood, from coal, gas, and electricity. This heat is useful to us as it

helps us in cooking and keeping warm. The sunlight helps us to dry the wet clothes. The steam engines use heat to move.

- The teacher will take two tissues. She will sprinkle water on both to make then wet. She will put one in the Sun and the other on the desk. Which tissue dried quickly? The one put in the Sun, due to the heat.
- Give a piece of ice to each student, they have to observe if ice melts due to the warmth of their hands. What happens to ice cream, does it melt in our mouth or in the bowl. It melts due to the warmth in our mouth and in the bowl due to the heat of the room. Candles melt when they are burnt, due to the heat. Heat can change the states of matter. When the object is heated the molecules in it begin to move faster and heat energy is produced.

Assessment

1. Activity 3, page 69 (to be done under the supervision of the teacher)
2. Exercise question 2, page 71

Reinforcement /homework

Answer the following questions

i. Why does ice cream melt in your mouth?
ii. Can heat change the state of matter?
iii. Write three ways in which heat is useful for us?
iv. Name 3 natural sources of heat.
v. Name some other sources of heat.

Lesson plan 2

Student learning outcome

Explain how the thermometer is used. Measure the temperature of human body.

Material

thermometer from laboratory, clinical thermometer

Keywords

thermometer, temperature, degrees

Overview

Students in this lesson, will learn how heat is measured. They will be explained about the two scales used to measure the temperature, and how to take reading from the thermometer.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. How do we measure temperature?
2. Why do we need to check temperature of things/people?

Method

- When we touch something hot or cold, we do not know how much hot or cold a substance is, until we use a thermometer. This instrument helps us to know about the hotness and coldness of a substance.
- A thermometer is a glass tube which is filled with a liquid which expands on heating, and rises up in the tube. When it is cooled, it contracts. Are there scales on the thermometer to read the temperature? The scale on the thermometer is marked in degrees. The thermometer of the Celsius scale is marked from zero to hundred degrees. The freezing point is zero degrees and boiling point is hundred degrees. Show a Clinical thermometer from the laboratory to the students.
- When a person is ill, his temperature will rise on the thermometer. The normal temperature of a human body is 37°C.

Assessment

1. Activity 4, page 70
2. Exercise question 1, page 71

Reinforcement /homework

1. Draw a clinical thermometer, as shown on page 70 in your notebooks.
2. Exercise question 3, page 71

The Earth

Lesson Plan 1

Student learning outcome

Discuss the physical features of the Earth.

Material

pictures of various land forms

Keywords

millions, created, glaciers, valleys, mountain, plane, plateau, desert

Overview

This lesson will help the students understand the ratio of land and water on the Earth. It will further explain that land is not the same all over. There are different physical features.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Is there more land or water on Earth?
2. 2 .Is the land same all over the Earth?

Method

- Begin the lesson by reading page 72 and 73 from the Students' Book.
- Show a large map of the world showing the physical features. All the land area is coloured brown or green while the large expanses of water are shown in blue colour. The students will be asked to look at the map, is there more water or land? 71% of the Earth's surface is covered with water. And the rest is land in different shapes such as mountains, valleys and plains.
- The Earth was created four billion years ago. It was hot as it was still melted lava. After the lava cooled down after a million years, the upper crust began to form.

Then clouds appeared and water in the form of oceans came into being. The Earth is the only planet in the Solar System which has water and oxygen. Both these things are essential for life. The land is not the same all over the Earth.

- Valleys are the low lying land between two mountains. Most valleys have streams. The Hunza valley of Pakistan.
- Mountains are large high stretches of land with peaks. Their sides are sloping. Mountains are over 350 meters, if they are lower they are called hills. Margalla hills of Islamabad.
- Plain is flat land which does not have high places. They are usually at the bottom of a valley. The Indus plains.
- Plateau is a land having a level surface. It is high above the sea. The Balochistan Plateau.
- Desert is dry land. There is little rain, lots of sand with very few plants. Thar Desert.

Assessment

Exercise questions 2 and 3, page 80

Reinforcement/homework

Answer the following questions.

i. Name two big deserts of the world.
ii. Name two big oceans of the world.
iii. Name two polar regions.
iv. Name countries where forests are found in the world

Lesson plan 2

Student learning outcome

Identify natural resources, their uses and importance.

Material

pictures of things made of plant and animal resources

Keyword

transportation, medicines, biscuit, yoghurt, delicious, leather

Overview

The students will be explained that natural resources are plants animals, and the minerals which exist naturally in the Earth and are useful to human beings.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Can you name things made from plants, earth, and animal?

Method

- Begin the lesson by drawing three columns, for plants, animals and earth, on the board. The students have to name things which they know of, for each of the column. After this activity, explain that there are many natural resources on Earth which are useful to us. It could be plants animals or the minerals and metals.
- Our country Pakistan has a varied landscape, tall mountains, deserts, green plains with rivers and sea. The natural resources of our county are used in many ways.
- Water is used for drinking, washing, cooking, and even for transportation.
- Plants make the environment healthy and beautiful. We also have fertile farms which provide us with many kinds of fruits, vegetables, and grains. The plants also give us wood to make furniture, use as fire wood, and even medicines. Cotton is used in making cloth.
- Animals are as important for us as the plants. We get meat and milk. We also use wool. The skin of animals for leather. Animals like bullock are used for working on the farms. They pull carts, help to plough the fields, and draw water out of irrigational canals.
- Minerals are found underground and in the mountain. Marble, silver, coal, gas and oil are found in our country. Marble is used to decorate buildings. Oil, gas and coal are used to produce energy and for transportation.

Assessment

Activity 2, page 76

Reinforcement/homework

Activity 3, page 76

Lesson plan 3

Student learning outcome

Learn about endangered and extinct animals.

Material

pictures of extinct animals and endangered animals

Keywords

extinct, endangered, Markhor, dolphin, weasel

Overview

This lesson will explain that animals and plants are a natural part of the Earth's landscape. Many animals and plants have been lost due to the destruction of their habitat. Some animals are endangered if special care is not taken to protect them.

Teaching methodology

Exploring knowledge through essential questions	5 min
Method/activity	25 min
Assessment	10 min

Essential questions

Before starting the lesson, ask some questions to explore the background knowledge of students:

1. Can you name any extinct animal?
2. What do you understand by endangered

Method

- At the beginning of the lesson read page 77 of the Students' Book in the classroom. Many animals which were a part of the Earth many years ago are no longer there, they have been hunted for trophies to be displayed. In this way, we have lost many beautiful and useful animals. These animals are called extinct. Some animals which have become extinct are the dinosaurs and the dodo bird.
- The endangered animals are those which are in the danger of going extinct and so, we must try to protect them from dying out. The Markhor, tiger, and giant pandas are among the many animals which are in danger of being hunted and killed. We are also losing them to pollution, destruction of their habitat and hunting. If we do not take care we will lose them too.
- What must we do to save our environment from destruction? In order to save our environment from further destruction, we have to take drastic steps. Trees must

be planted and not cut. Trees are the homes of many animals. Hunting animals for their fur or other body parts should be banned. We should recycle things, reuse some of them and also reduce the use of things made of plastic.

Reinforcement/homework

1. Answer the following question.
   i. Which animals are known as endangered? Give one example.
   ii. Which animals are known as extinct? Give one example.
   iii. Why are trees important for our environment? Give two reasons.
   iv. Why are the 3 "R" used in keeping our environment clean?
2. Exercise question 1, page 79

Answers to the Exercises

Unit 1

1. Answer the following questions.
   i. Define respiration in plants.

      Plants take in oxygen and give out carbon dioxide. This is known as respiration.

   ii. Explain why animals move?

      Animals can walk and run, they move in search of water and food. They also move to protect themselves.

   iii. Explain why living things need food?

      Living things need food to provide them with the energy to grow, move and work.

   iv. Name two animals that lay eggs.

      The two animals that lay eggs are birds and fishes.

2. All living things have seven features. List them
   i. breathe
   ii. need food and water
   iii. move
   iv. grow
   v. have senses
   vi. reproduce
   vii. excrete

4. Complete the boxes in the book. Refer to the chapter for answers.

Unit 2

1. Answer the following questions.
   i. List three things which plants need to grow.

      Plants need water, sunlight and soil to grow.

   ii. List the parts of the plant the shoots consists of.

      The shoots consists of the flowers, fruit, seeds, and the leaves.

   iii. What is photosynthesis?

      Photosynthesis is the process by which the plants make their food.

iv. What part of the plant helps to absorb water from the soil?

The root absorbs the water from the soil.

v. What is the function of the flower?

The flowers make the seeds.

2. Fill in the blanks

i. two

ii. underground

iii. shoot

iv. blade

v. chlorophyll

3. Complete the chart.

Parts of the plants	**Characteristics**
Flower	The flower makes seeds for the plant
Fruit	Is the fleshy part of the plant. It protects the seeds
Leaf	Makes the food with the help of sunlight, water and carbon dioxide.
Seed	Makes new plants.

4. Draw a mango, an orange, an apple, and a watermelon showing the number of seeds present in them. Refer to page 13 for hints.

Unit 3

1. Answer the following questions.

i. What is a habitat?

A habitat is a place where living things lives and finds all it needs to grow and reproduce.

ii. Why do you think plants have thick leaves in the desert?

Plants have thick leaves in the desert to store food.

iii. Which animals are found in grassland?

Lions, zebras, giraffes, ostriches are found in grassland.

iv. What do you understand by adaption?

Adaption is the way in which an animal or plant survives in its particular environment.

v. How is the environment polluted?

The environment is polluted by the cutting of trees, hunting of animals, polluting the water and air with chemicals.

2. Fill in the blanks
   i. water
   ii. food
   iii. shelter
   iv. sunlight
   v. air
4. Write the name of the organism next to its adaptation.

Adaptation	**Organism**
Hump where fat can be stored so it can go without food and water	camel
Thick fur to keep the animal warm	Polar bear
Long roots which can grow deep in the underground to reach the water below.	Cactus plant
Covered in pointy projections called needles to protect from predators.	Cactus plant
Strong teeth and claws.	Tigers, Lions,
The Long eyelashes to protect the eyes from sand storm.	camel
Long hollow stem to float on water.	Lotus plant

Unit 4

1. Answer the following questions.
   i. What are sensory organs?
   The sensory organ are eyes, ears, nose, tongue,. and skin.
   ii. Why do you think food is important for us?
   Food is important for us, as it gives us energy to do work.
   iii. If you need to improve your eyesight which foods will help?
   Carrots and cod liver oil will help.
   iv. Why should we take a balanced diet?
   We should take a balanced diet to be healthy and strong.
   v. Why do you think unhealthy food should not be eaten?
   We should not eat unhealthy food as they make us weak and overweight.
2. Write true or false.
   i. False

ii. False

iii. False.

iv. True

v. True

3. Name three of your favourite dishes which you can recognise from their delicious smells. Answers depend on the students.
4. Draw a picture of something you can see.

   Draw a picture of something you can hear.

   Draw a picture of something you can feel.

   Answers depend on the students.
5. Name three things sweet, sour, bitter and salty

Sweet	**Sour**	**Bitter**	**salty**
Candy	Lemon	Bitter gourd	chips
Honey	Tamarind	grapefruit	French fries
Ice cream	Vinegar	medicine	Salted peanuts

6. Look at the chart of food items and parts of the body below. Match the food items with the parts of the body that they help most.

Body parts	**Food items**
skin	green vegetables, mangoes, peaches, apricots
eyes	carrots, cod liver oil, liver, eggs, cheese
teeth and gums	milk, vegetables, eggs, potatoes, mutton, tomatoes, oranges, lemon
tongue	liver, eggs, papaya
bones	fish, eggs, milk, mutton, butter, liver

7. Answer depends on the students' responses in the classroom.
8. Play the board game in the book.

Unit 5

1. Answer the following questions

   i. What is matter?

   Matter has weight and takes up space.

   ii. Can you give some examples of liquids?

   Water, juice, oil

iii. What will happen to ice (solid) when it is heated?
It will melt and become water.

2. Circle those things that are filled with air.
To be done in book.

3. Write true or false.
   i. True
   ii. False
   iii. False
   iv. True
   v. True

Unit 6

1. Answer the following questions.
   i. How many glasses of water do you drink in a day?
   We have to drink eight glassed of water in a day.
   ii. How do we use water?
   Name three ways.
   1. drinking 2. Washing 3. Cooking
   iii. What happens to animals and plants if they do not get water?
   The animals and plants will die without water.
   iv. What is the most natural source of water?
   Rain is the most natural source of water.
   v. What is condensation?
   When water vapours cool down and turn into water is known as condensation.
2. Name three sources of water.
   i. Rivers
   ii. Lakes
   iii. Wells

Unit 7

1. Answer the following question
   i. Is force needed to stop moving objects?
   Yes, force is needed to stop moving objects.
   ii. What would happen if there was no force of friction?

We would not have been able to walk, run or hold things.

iii. Ahsan is participating in a car race. What does he need to win the race?

smooth surface, new tires

iv. The floor of one room is made of cement. The floor of another is made of marble. Which surface has more friction? On which floor are you likely to slip?

The cemented floor has more friction. The smooth floor is the one on which you are likely to slip.

v. Look at these children and their shoes. Which one is more likely to slip and fall?

The second child, because he is wearing leather shoes.

vi. Why do shoes have patterned soles?

The patterned soles help us from not slipping.

3. Fill in the blanks.

i. force

ii. position

iii. less

iv. friction

v. heat

3. Name and draw four simple machines which we use in our daily life.

Refer to page 58 of Students' Book for the answer.

4. Look at the list below and fill in the chart.

Name of object	Smooth	Rough
Glass	*	
Table		*
Science book	*	
Blackboard		*
Dust		*
Oil	*	
Sandpaper		*

Unit 8

1. Answer the following questions.

i. Name the natural source of light in the day.

The natural source of light in the day is the Sun.

ii. How do you think light travels?

Light travels in a straight line.

iii. Illustrate how any eye is able to see a book.

Refer to the chapter.

iv. Differentiate between opaque and transparent.

Opaque objects are those through which light does not pass. Transparent objects are those through which light passes.

v. What would happen to the trees if there was no light?

The trees will die as they will not be able to make food.

2. Fill in the blanks.
   i. sunlight
   ii. straight
   iii. light
   iv. shadows
   v. warm
3. Practice making fun shadows with a torch.

Unit 9

1. Answer the following questions.
   i. What happens when ice or ice cream are kept in the Sun?

   They will both melt.

   ii. What is temperature?

   Temperature is the hotness and coldness of a substance.

   iii. How would you measure your temperature if you had fever?

   We will use a thermometer to check the fever.

   iv. List down some uses of heat.

   Cooking, heating, drying

   v. Write a few sources of heat.

   The Sun, gas, electricity, wood, and coal.
4. Write true or false.
   i. False
   ii. True
   iii. True
   iv. False
   v. False

Unit 10

1. Answer the following questions.
   i. What are natural resources?

      Natural resources are things which grow or exist naturally on earth and useful for human beings.

   ii. Name four natural resources.

      Plant, animals, oil, and coal

   iii. What do you understand by endangered animals?

      Name two endangered animals of Pakistan. Endangered animals are those which are on the verge of extinction. Dolphin and the Markhor are two endangered animals.

   iv. What are extinct animals?

      Name one extinct animal and give reason for its extinction. Extinct animals are those which have completely died out. Dinosaurs are an example. They died out due to lack of food.

   v. Write two ways in which we can save trees.

      1. Stop cutting trees.
      2. By planting new trees.

   vi. Why are animals hunted and killed? Give two reasons.

      1. Animals are hunted for their fur and other body parts.
      2. To be used as hunting trophies.

2. Write true or false
   i. False
   ii. True
   iii. True
   iv. True
   v. False
3. Draw a picture of each landform. Refer the students to pages 72 and 73.

Notes

Notes

باب 6

سبق شروع کرنے سے پہلے طلبا سے پوچھیے کہ ہم پانی کیسے استعمال کرتے ہیں۔ انھیں پانی کے مختلف مآخذ یا ذرائع سے آگاہ کیجیے۔ انھیں آبی چکر کا چارٹ دکھایئے اور اس کی وضاحت کیجیے۔ بحث کیجیے کہ ہم کیسے پانی کو ضایع ہونے سے بچا سکتے ہیں۔

باب 7

طلبا سے پوچھیے کہ قوت کیا ہوتی ہے؟ ہم کیسے اس کا استعمال کرتے ہیں؟ طلبا کو مثالوں کے ذریعے بتایئے کہ قوت کیا ہوتی ہے جیسے دروازوں، باکس اور بوتل کو کھولنے اور بند کرنے کے ذریعے، یا گاڑی کو دھکا لگا کر۔ طلبا سے کہیے وہ اس کی مختلف مثالیں بیان کریں کہ چیزوں کو حرکت دینے کے لیے ہم کس طرح قوت کا استعمال کرتے ہوئے انھیں دھکیلتے یا کھینچتے ہیں۔ بیان کیجیے کہ بجلی پیدا کرنے کے لیے کیسے پانی اور ہوا کی قوت سے کام لیا جاتا ہے۔

باب 8

بیان کیجیے کہ ہمیں دیکھنے کے لیے روشنی کی ضرورت کیوں ہوتی ہے۔ روزمرّہ زندگی میں روشنی کے کردار پر بحث کیجیے۔ یہ بیان کرنے کے لیے سرگرمی 2 انجام دیجیے کہ روشنی خط مستقیم (straight lines) میں سفر کرتی ہے۔ طلبا کو باہر دھوپ میں لے کر جایئے اور بیان کیجیے کہ سائے کیسے بنتے ہیں۔ مختلف اشیا جیسے شیشہ، کاغذ، گتہ وغیرہ لے کر آیئے اور پوچھیے کہ کون سی چیز غیر شفاف، شفاف اور نیم شفاف ہے۔

باب 9

باب میں دی گئی سرگرمیوں 1 تا 3 کا عملی مظاہرہ کرتے ہوئے حرارت کے تصوّر کی وضاحت کیجیے۔ طلبا سے پوچھیے کہ گھر پر حرارت کے کیا استعمالات ہوتے ہیں۔ برف کے ٹکڑے (ice cube) کا استعمال کرتے ہوئے مادّے پر حرارت کے اثر کو بیان کیجیے۔ تھرمامیٹر لے کر آیئے اور طلبا کو عملی مظاہرے کے ذریعے بتایئے کہ اس کا استعمال کیسے کیا جاتا ہے۔

باب 10

طلبا سے کہا جاسکتا ہے کہ اہم زمینی خدوخال (landforms) کے نام اور محل وقوع تلاش کریں۔ پہاڑیوں کی بلندی، سمندر کی گہرائی اور میدانوں کی وسعت یا پھیلاؤ پر گفتگو کیجیے۔ طلبا سے زمین اور اس کی شکل یا ہیئت کے بارے میں استفسار کیجیے۔ زمین کی مختلف خصوصیات کو زیر بحث لایئے۔ پہاڑ، میدان، سطح مرتفع، اور وادی کا باہمی فرق بیان کیجیے۔ طلبا جو چیزیں استعمال کرتے ہیں ان کے بارے میں پوچھیے کہ کون سی چیز زمین یا جنگلات سے حاصل ہوتی ہے۔ طلبا کو ڈائنوسارز کی تصویر دکھایئے اور بحث کیجیے کہ یہ کیوں معدوم یا ناپید (extinct) ہوگئے۔

نوٹس برائے اساتذہ

باب 1

طلبا کو جان دار اجسام کی بنیادی ضروریات سے آگاہ ہونا چاہیے۔ مختلف تصویریں لے کر آیئے اور جانوروں، انسانوں اور پودوں میں جان دار اجسام کی خصوصیات کا موازنہ کیجیے۔ باب میں مذکورہ سرگرمیاں انجام دینے میں طلبا کی مدد کیجیے۔ طلبا سے پوچھیے کہ کیا انھوں نے مرغی کے انڈے میں سے چوزہ نکلتے یا کسی جانور کو اپنے بچے کو غذا کھلاتے یا پلاتے ہوئے دیکھا ہے۔

باب 2

طلبا سے پوچھیے کہ پودے ہمارے لیے کس طرح مفید ہیں۔ استفسار کیجیے کہ پودوں کو زندہ رہنے کے لیے کس چیز کی ضرورت ہوتی ہے؟ طلبا پر واضح کیجیے کہ پودے کیسے ضیائی تالیف (Photosynthesis) کے ذریعے اپنی خوراک تیار کرتے ہیں۔ ایک پودا کلاس میں لے کر آیئے اور اس کے مختلف حصوں کو بیان کیجیے۔

باب 3

طلبا کو بتایئے کہ مسکن (habitat) کیا ہوتا ہے۔ ان سے کہیے کہ اپنے گھر یا کلاس کے اطراف کو بیان کریں۔ طلبا کو ان کے گھر اور کلاس کے ماحول میں فرق بتایئے۔ ان کے گروپ بنادیجیے۔ ہر گروپ کو اس بارے میں چارٹ بنانے کی ہدایت کردیجیے کہ ہر مسکن کے پودے اور جانور کیسے زندہ رہتے ہیں۔ ہر گروپ ایک مسکن کو زیر بحث لائے گا۔

باب 4

طلبا کو ہمارے جسم کے حسی اعضا کی اہمیت سے آگاہ کیجیے۔ ان سے پوچھیے کہ انھیں کھانے میں کیا کیا پسند ہے۔ انھیں یاد دلایئے کہ کچھ غذائیں جو انھیں پسند ہیں، وہ پودوں یا جانوروں سے حاصل ہوتی ہیں۔ طلبا سے کہیے وہ صحت بخش غذا کھانے کی اہمیت پر 5 سطریں لکھیں اور پھر کلاس کے سامنے پیش کریں۔

باب 5

کلاس میں موجود مختلف چیزوں کی طرف اشارہ کیجیے اور پوچھیے کہ یہ اشیا کس حالت میں ہیں۔ ان کی وزن اور جگہ گھیرنے کی خصوصیات پر گفتگو کیجیے۔ یہ دکھانے کے لیے سرگرمی (سرگرمی 2 اور 3) انجام دیجیے کہ مائع اور گیس بھی وزن رکھتی اور جگہ گھیرتی ہیں۔ طلبا پر واضح کیجیے کہ کیسے مائعات بھی تین حالتوں میں پائے جاسکتے ہیں۔

قومی نصاب برائے جنرل سائنس کے مطابق جانچ (Assessment) کی حکمت عملیاں

استاد طالب علم کی تعلیمی کارکردگی سے نہ صرف روایتی ٹیسٹ، امتحانات اور عملی کام (پروجیکٹ) کے ذریعے واقف ہوتے ہیں بلکہ طلبا کا لمحہ بہ لمحہ مشاہدہ بھی اس میں معاون ہوتا ہے۔ سائنس کے بارے میں طلبا کی معلومات، سائنسی مہارتوں، اور رویوں کو جانچنے کے لیے اساتذہ کو مختلف النوع اوزار (tools) اور طریقہ ہائے کار کی ضرورت ہوتی ہے۔ مثلاً:

- ☆ مخصوص ردعمل
- ☆ تعمیری/تخلیقی ردعمل
- ☆ کارکردگی کی جانچ
- ☆ ذاتی ابلاغ (personal communication)
- ☆ طلبا کی خود تشخیصی (self-assessment)

سائنس کی تشخیصی حکمت عملیوں پر مفصّل ہدایات کے لیے قومی نصاب برائے جنرل سائنس 2006 کا باب 8، صفحہ 65 تا 73 ملاحظہ کیجیے۔

رہنمائے اساتذہ کے مشتملات اور ترتیب

رہنمائے اساتذہ برائے نیو گیٹ اہیڈ سائنس میں سبق کا آغاز کرنے کے لیے تجاویز شامل ہیں نیز ہر باب کے لیے تدریسی حکمت عملیاں بھی فراہم کی گئی ہیں۔ ہدایاتی ماڈل کا مرکز ومحور سابقہ یا پہلے سے موجود معلومات کو کھنگالنا ہے جس میں طلبا کی سرگرم شرکت کی حوصلہ افزائی کی جاتی ہے۔

ایک فعال اور طالب علم محور کمرۂ جماعت کے لیے سفارش کردہ ترتیب کار (شیڈول)

سابقہ/ پہلے سے موجود معلومات کو کھنگالنا بذریعہ بنیادی سوالات	5منٹ
آموزش (learning) بذریعہ بحث/ سرگرمی	25 منٹ
نتیجہ/ ماحصل بذریعہ جانچ	10 منٹ

ہر باب کا ابتدائی حصہ تعمیری انداز میں سبق کو آگے بڑھانے کے لیے بنیادی تجاویز پر مشتمل ہے۔ دوسرے حصے میں کتاب میں موجود تمام سوالات کے جوابات دیے گئے ہیں۔ طلبا کی حوصلہ افزائی کی جائے کہ وہ اپنے ذہن سے کام لیتے ہوئے جوابات دیں اور پھر استاد ان جوابات کی بنیاد پر طلبا کی تفہیم اور معلومات کی جانچ کر سکتے ہیں۔

قومی نصاب برائے جنرل سائنس کے مطابق تدریسی حکمت عملیاں

مؤثر ہدایاتی تدریسی حکمت عملیوں میں مندرجہ ذیل شامل ہیں (تاہم حکمت عملیاں انھی تک محدود نہیں ہیں):

- تحقیق وتفتیش (انکوائری)
- سوالات اور گفتگو
- تحقیق اور مسئلے کا حل
- عملی مظاہرہ اور تجربہ گاہی کام (لیبارٹری ورک)
- مسائل پر مبنی آموزش (problem based learning)
- پوری جماعت، گروپ، اور انفرادی کام سے استفادہ
- خواندگی کی حکمت عملیوں (پڑھنا، لکھنا، بولنا اور سننا) کی شمولیت
- طالب علم کے کام کی بنیاد پر ہدایات کی فراہمی

سائنس کی تدریسی حکمت عملیوں پر مفصّل ہدایات کے لیے قومی نصاب برائے جنرل سائنس 2006 کا باب 7، صفحہ 55 تا 64 ملاحظہ کیجیے۔

تعارف

نیو گیٹ اہیڈ سائنس سیریز کے لیے تیار کردہ رہنمائے اساتذہ کمرۂ جماعت میں استاد کی معاونت کے لیے ہدایات فراہم کرتی ہیں۔ اِس رہنمائے اساتذہ میں شامل ہے:

- کمرۂ جماعت میں نیو گیٹ اہیڈ سائنس کی مؤثر تدریس کا طریقہ
- قومی نصاب میں مذکور تدریسی حکمت عملیاں
- سبق کی تدریس کی منصوبہ بندی کے نمونے
- نصابی کتاب میں دی گئی مشقوں کے مجوزہ جوابات
- جانچ (assessments) کے لیے مجوزہ ورک شیٹ
- کام کی مجوزہ اسکیم

نیو گیٹ اہیڈ سائنس کی تدریس کیسے کی جائے

نیو گیٹ اہیڈ سائنس کی مزید تعمیری انداز میں تدریس کے لیے اساتذہ کو مشورہ دیا جاتا ہے کہ طالب علم کو کمرۂ جماعت کا محور بنائیے۔ طلبا کو کمرۂ جماعت میں زیادہ فعال کردار دیا جائے، اُن کی حوصلہ افزائی کی جائے تاکہ وہ اپنے خیالات اور تصورات کو اعتماد کے ساتھ پیش کریں، نیز انھیں مختلف آرا کا احترام کرنا بھی سکھایا جائے۔ یہ تمام مقاصد حاصل کرنے کی غرض سے اساتذہ کے لیے ضروری ہے کہ طلبا کی معاونت کرتے ہوئے انھیں آسانیاں فراہم کیجیے تاکہ وہ زیادہ ذمے داری کے ساتھ اپنا سفرِ آموزش (learning journeys) طے کرسکیں۔ مندرجہ ذیل سطور میں ان تدریسی طریقوں کا خلاصہ کیا گیا ہے جن سے کام لیتے ہوئے کمرۂ جماعت کو زیادہ سے زیادہ طالب علم محور بنانے کے لیے نیو گیٹ اہیڈ سائنس کے تمام ابواب پڑھائے جائیں گے:

- طلبا کو انفرادی اور اجتماعی، یعنی گروپ میں، کام کرنے کا موقع فراہم کیا جائے۔ اساتذہ اور طلبا حقیقی زندگی سے مثالیں زیر بحث لائیں۔
- طلبا کو ایسے کام / ذمے داریاں تفویض کی جائیں جنھیں انجام دیتے ہوئے وہ آپس میں، اور استاد کے ساتھ تبادلۂ خیال کرسکیں۔ طلبا کی حوصلہ افزائی کی جائے کہ وہ اپنی رائے یا خیالات کے پس پردہ وجوہ بیان کریں۔
- استاد کے لیے ضروری ہے کہ وہ کمرۂ جماعت میں خود کو عزت و احترام، شرکت اور فعال آموزش (active learning) کے آئیڈیل کے طور پر پیش کریں۔ گروپ کے مباحثوں کے دوران مل جل کر کام کرنے کے لیے طلبا کی حوصلہ افزائی کی جائے۔
- استاد کو طلبا کی معاونت اس وقت کرنی چاہیے جب انھیں رہنمائی کی ضرورت ہو؛ پڑھتے، لکھتے اور مخصوص ابواب میں اسباق پر بحث کرتے ہوئے بیشتر وقت طلبا اپنے طور پر کام کریں گے۔