

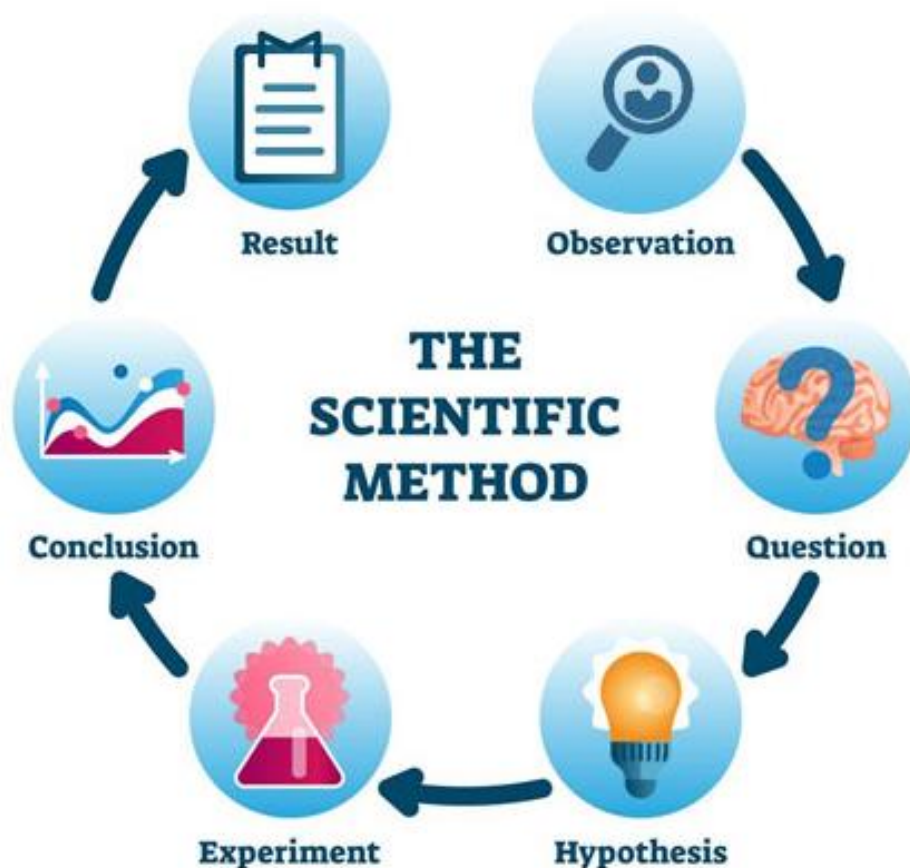


EDUCATIONAL RESEARCH INSTITUTE

Explore Your World

Science Book IV

Teachers Guide



Head Office: C-10 Block-J North Nazimabad, Karachi

Phone: 021-36624151 | +92 309 6664297

Email: contact@eri.edu.pk Website: www.eri.edu.pk

Table of Contents

01 Characteristics and Life Processes of Organisms

4

02 Our Body at Work

15

03 Ecosystems

27

04 Health and Hygiene

40

05 Matter and its Characteristics

53

06 Forms of Energy and Energy Transfer

61

07 Forces and Motion

78

08 Earth and its Resources

88

09 Earth in the Solar System

96

Important Notes for Users

Dear Teachers,

Explore Your World - Science Book IV Guide is in your hands. We suggest you to keep in mind the following points before/ while using it:

- a. This Guide aims to provide guidance to teachers of Science Book IV – Explore Your World
- b. It includes suggested hands on activities, quizzes and worksheets. You are advised to use them, keeping in view your time and resource limitations.
- c. Suggested video links have also been shared. We would strictly advise you to watch the suggested video in full before showing it to the class and download on your system.

Playing a video directly from YouTube is not advised. It brings in a host of other suggestions, distracting students.
- d. Kindly note that at the end of each lesson, Reflections need to be jotted down, to understand the shortcomings of the lesson conducted and challenges faced. This helps a great deal for the next lesson.
- e. Reinforcement Sheets must be prepared for each Unit, covering all important learning points from the Unit.
- f. A project that helps students show what they understood can also serve as Reinforcement.
- g. Soft boards should also display important concepts and vocabulary from each Unit.

Unit 01: Characteristics and Life Processes of Organisms

SNC Learning Outcomes for Unit 01

All the students should be able to:

- Compare and contrast characteristics that distinguish between major groups of living things (plants and animals).
- Classify animals in terms of vertebrates and invertebrates with examples and compare the differences and similarities in vertebrates and invertebrates.
- Classify plants in terms of flowering and non-flowering plants with examples and analyse the differences and similarities between them.
- Identify parts of a plant (leaves, stem, flowers, seeds, roots).
- Relate the structures of plants to their functions (i.e., roots absorb water and nutrients and anchor Allah made the plant, leaves make food, the stem transports water and food, flowers produce seeds, and seeds produce new plants).

Lesson 1: Living things

Estimated Time Required: 40 minutes

Lesson Objectives:

By the end of this lesson, students will be able to:

- Sort out living and non-living things on the basis of their characteristics.
- Compare and contrast characteristics that distinguish major groups of living things i.e. plants and animals.

Teacher's Resources:

- A potted plant, a bird (if possible), some plastic objects in small size and some plastic animals in small size
- Soft board Display
- Explore Your World – Science Book IV



















Islamic Integration: Allah SWT is the creator of everything. This whole universe and its creatures are created by Allah SWT. He made living and non-living things so that each and everything benefits humans.

And in the creation of yourselves and the fact that animals are scattered (through the earth), are Signs for those of assured Faith. [Al-Jathiyah 45:4]

NAME: _____ CLASS: _____ DATE: _____

LIVING & NON-LIVING THINGS

Identify the images, and if it's a living thing color the adjacent box as green, else as red.

وَفِي خَلْقِكُمْ وَمَا يَبُتُّ مِنْ دَابَّةٍ آيَاتٌ لِّقَوْمٍ يُوقِنُونَ

Indeed, Allah is the One Who causes seeds and fruit stones to sprout. He brings forth the living from the dead and the dead from the living. That is Allah! How can you then be deluded 'from the truth'?

إِنَّ اللَّهَ فَالِقُ الْحَبِّ وَالنَّوَى يُخْرِجُ الْحَيَّ مِنَ الْمَيِّتِ وَيُخْرِجُ الْمَيِّتَ مِنَ الْحَيِّ ذَٰلِكُمُ اللَّهُ فَالِقُ تُوَفِّكُونَ

When to instil it: After the lesson discussion is complete.

Soft board Display: Image given

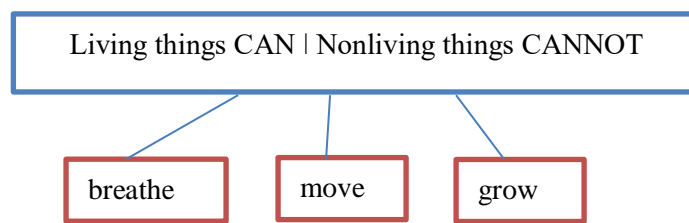
Instructional Stages:

Warm-up activity: Learners will look at the items teacher has brought and

will sort out everything into living and non-living things.

Direct Instructions: Teachers will discuss with class:

Characteristics of living and non-living things



Comparison between Animals and Plants (Can be used as soft board material or can be drawn on board.)



Guided and Independent Practice:

- Discuss with peers living and non-living things from the given picture in notebook.
- Next, the teacher can help them compare the qualities of living and non-living things given in book through a T- chart, by drawing it on the board.
- Characteristics of plants and animals given in Venn diagram will be discussed as a review.

Class Work:

- List down living and non-living things from picture given in book.
- Comparison between living and non-living through T-chart.
- Q 1 from STOP AND ASK YOURSELF.

Home Assignment: Do 2 and 3 of STOP AND ASK YOURSELF in the notebook.

Vocabulary
Venn
divide
breathe
reproduce

Suggested Videos for this Lesson

<https://www.youtube.com/watch?v=HGJVrZ2-DVo>



Reflection

Teacher must note down her Reflections at the end of each lesson.

What went well

What I couldn't accomplish

Students' response on activity

STOP AND ASK YOURSELF

Q. 1: Give reasons why plants are considered living things.

Ans: Plants are living things because they breathe, grow and reproduce.

Q. 2: Write three differences between plants and animals.

S. No	Plants	Animals
i	They are mostly green.	They are of various colours.
ii	They are fixed due to their roots	Animals can move from place to place
iii	They make their own food	They feed on plants and other animals

Q. 3: Write three similarities between plants and animals.

Ans: They both:

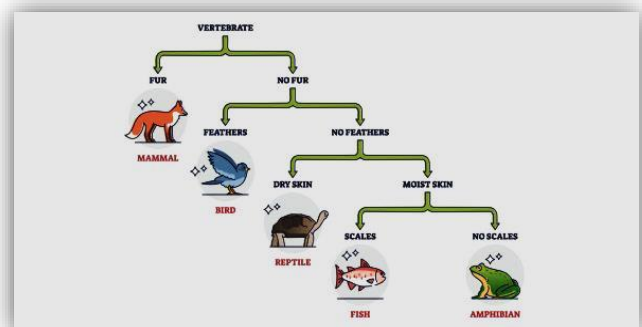
are living things	breath oxygen	grow
die	reproduce	

Lesson 2: Animal kingdom Vertebrates | Qualities of Vertebrates Immune System | Warm/ Cold Blooded Animals

Estimated time required: 2 Lessons of 40 minutes

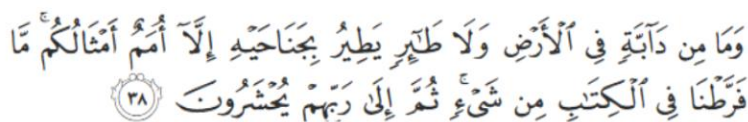
Lesson Objectives: By the end of the lesson, students will be able to:

- Define vertebrates as animals with back bone.
- Identify five kinds of vertebrates.
- Compare warm blooded animals with cold blooded animals.



Teacher's Resources:

- Soft board Display
- Explore Your World – Science Book IV



Islamic Integration: Allah SWT created animals for you, that provides for humans: meat, skin and other beneficial things.

There is no animal that crawls on the earth, no bird that flies with its two wings, but are communities like you. We have neglected nothing in the Book (of decree). Then to their Lord will they all be mustered.

[Al-An'am 6:38]

When to instil it: At the beginning of the lesson

Instructional Stages:

Warm-up Activity:

Through probing questions:

- Living things that can move from place to place are called _____
- What allows animals to move while plants cannot move? Answers may vary. (bones, skeletal systems, muscular system, nervous system)
- Bones-Skeletal system

Direct Instructions:

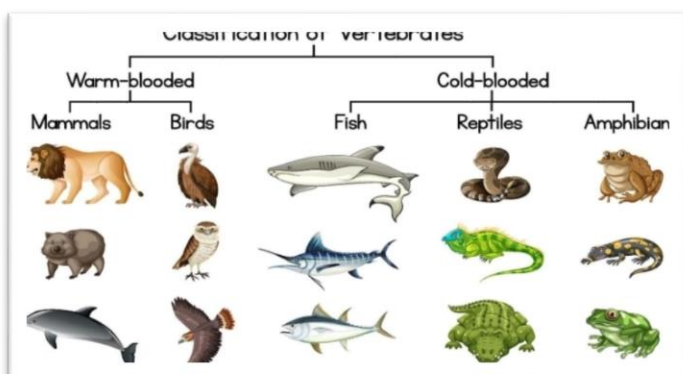
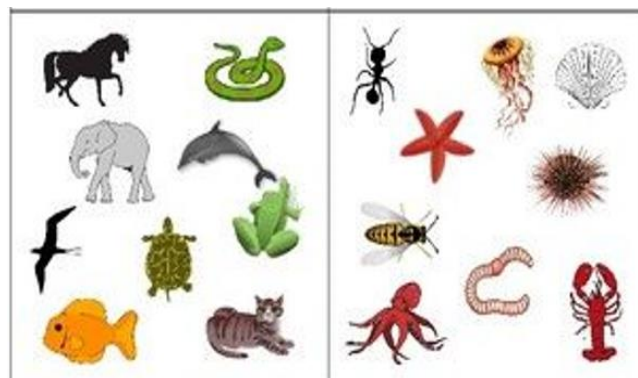
- Information given in the book under the following headings will be discussed with the class:
 - Vertebrates
 - Qualities of vertebrates
 - Immune System
- Classification of vertebrates: Teacher can draw a concept map on the board to explain this.

Guided and Independent Learning:

Students will watch a video and then will try to sort animals on the basis of the knowledge they gained. Teacher will provide a list of animals. (Find worksheets)

- Warm blooded - can maintain their body temperature
- Cold blooded - cannot maintain their body temperature-

Vocabulary
vertebrates
invertebrates
backbone
skeletal
muscular
excretory
nervous
immune
regulates
warm-blooded
cold-blooded
regenerate



Class Work: Discuss Q2 and Q3 STOP AND ASK YOURSELF.

Homework Assignment:











- Do Q2 and Q3 STOP AND ASK YOURSELF.
- Draw/ paste different pictures of 5 types of vertebrates in notebook

WRITE:		
mammal	bird	reptile
amphibian	fish	arthropod
	mollusc	
ANIMAL	TYPE	
1. bee		
2. beetle		
3. crab		
4. crocodile		
5. frog		
6. lobster		
7. owl		
8. polar bear		
9. shark		
10. snail		
11. snake		
12. spider		
13. squid		
14. tortoise		
15. zebra		

MAMMALS	
TICK (✓) THE CORRECT ANSWERS.	
Mammals	
- have got <u>feathers</u>	_____
- have got <u>fur or hair</u>	_____
- lay <u>soft</u> eggs	_____
- have <u>live babies</u>	_____
- are <u>viviparous</u>	_____
- are <u>oviparous</u>	_____
- drink <u>salt water</u>	_____
- drink their <u>mother's milk</u>	_____
- <u>don't</u> walk, they <u>fly</u>	_____
- <u>move</u> in different ways	_____
- only live in <u>water</u>	_____
- live in <u>different habitats</u>	_____
- can be <u>herbivores</u> , <u>omnivores</u> or <u>carnivores</u>	_____

Write BIRD, FISH or BOTH.

- | | | | |
|-------------------------------|-------|--------------------------------|-------|
| 1. has got <u>feathers</u> | _____ | 2. has got <u>scales</u> | _____ |
| 3. has got <u>fins</u> | _____ | 4. has got <u>two legs</u> | _____ |
| 5. has got a <u>tail</u> | _____ | 6. has got <u>wings</u> | _____ |
| 7. lays <u>soft</u> eggs | _____ | 8. lays <u>hard</u> eggs | _____ |
| 9. breathes with <u>lungs</u> | _____ | 10. breathes with <u>gills</u> | _____ |
| 11. has a <u>beak</u> | _____ | 12. live in <u>water</u> | _____ |

VERTEBRATES	INVERTEBRATES
	
VERTEBRATE <input type="checkbox"/>	VERTEBRATE <input type="checkbox"/>
INVERTEBRATE <input type="checkbox"/>	INVERTEBRATE <input type="checkbox"/>
	
VERTEBRATE <input type="checkbox"/>	VERTEBRATE <input type="checkbox"/>
INVERTEBRATE <input type="checkbox"/>	INVERTEBRATE <input type="checkbox"/>
	
VERTEBRATE <input type="checkbox"/>	VERTEBRATE <input type="checkbox"/>
INVERTEBRATE <input type="checkbox"/>	INVERTEBRATE <input type="checkbox"/>
	
VERTEBRATE <input type="checkbox"/>	VERTEBRATE <input type="checkbox"/>
INVERTEBRATE <input type="checkbox"/>	INVERTEBRATE <input type="checkbox"/>
	
VERTEBRATE <input type="checkbox"/>	VERTEBRATE <input type="checkbox"/>
INVERTEBRATE <input type="checkbox"/>	INVERTEBRATE <input type="checkbox"/>

liveworksheets.com

Lesson 2: Animal kingdom Invertebrates

Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- Compare vertebrates and invertebrates
- Sort out invertebrates into three types.

Teacher's Resources:

- Soft board Display
- Explore Your World – Science Book IV

Islamic Integration:

[Surah Al-Hajj 22:73]

يَا أَيُّهَا النَّاسُ ضَرْبٌ مَثَلٌ فَاسْتَمِعُوا لَهُ إِنَّ الَّذِينَ تَدْعُونَ مِنْ دُونِ اللَّهِ لَنْ يَخْلُقُوا ذَبَابًا وَلَوْ اجْتَمَعُوا لَهُ

O humanity! A lesson is

set forth, so listen to it 'carefully': those 'idols' you invoke besides Allah can never create 'so much as' a fly, even if they 'all' were to come together for that.

When to instil it: At the beginning of the lesson

Instructional Stages:

Warm-up Activity: Teacher will induce the session with a question on the board.

Can you think of an animal that has no backbone?

Direct Instructions: Teacher will discuss with students:

- Invertebrates and its classification
- Comparison between vertebrates and invertebrates.

Guided and Independent Learning: Learners will sort out invertebrates in the table given in book.

Class Work:

- Sorting invertebrates in the given table in book.
- Do Q1 STOP AND ASK YOURSELF Lesson 2 in notebook.

Home Assignment: Do Ex 3 in book.

STOP AND ASK YOURSELF

Q. 1: How are vertebrates different from invertebrates?

Ans: Vertebrates are different from invertebrates in various ways:

1. All Vertebrates have a backbone to hold their body; while invertebrates do not have backbone or skeleton.
2. Invertebrates can usually regenerate their missing body parts, while if a vertebrate misses a body part, it does not regrow.
3. Vertebrates breathe through their lungs or gills while most invertebrates breathe through their skin.
4. Some vertebrates can also regenerate.

Q. 2: What are warm-blooded animals?

Ans: Animals that can maintain their body temperature are called warm blooded animals.

Examples: birds and mammals.

Q. 3: How do warm-blooded animals keep their body temperature the same?

Ans: These animals can maintain their body temperatures because of the internal heat produced by their bodies. The warm-blooded animals, therefore, need more energy and consequently more food compared to cold blooded animals.

Lesson 3: Classification of plants Flowering and Non-flowering plants

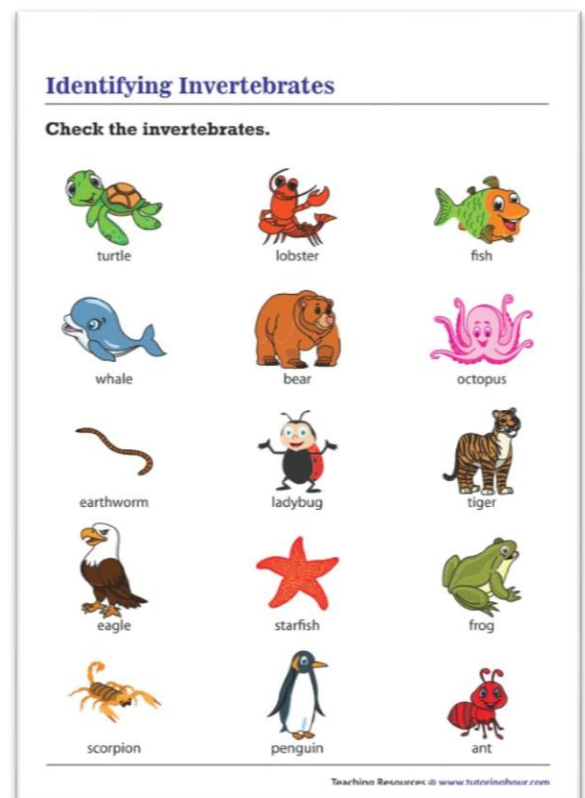
Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

1. Sort out given plants into flowering and non-flowering plants.
2. Analyse the differences and similarities among flowering and non-flowering plants.
3. Outline the role of flower in plants.

Teacher's Resources:

- Different flowers
- Soft board display



Vocabulary

flowering

non-flowering

angiosperm

spores

cones

earthen

- Explore Your World – Science Book IV

Soft board Display: Some dried flowers can be displayed.

Islamic Integration: Allah (سبحانه وتعالى) has made the flowers colorful and fragrant and gave some of them special nectar so they can attract various insects and birds, the bees, butterflies, wasps, insects and birds get their nourishment from flowers and help the plants in producing seeds.

And your Lord inspired the bees: "Make 'your' homes in the mountains, the trees, and in what people construct..."
[Surah Nahl 16:68]

وَأَوْحَىٰ رَبُّكَ إِلَى النَّحْلِ أَنِ اتَّخِذِي مِنَ الْجِبَالِ بُيُوتًا وَمِنَ الشَّجَرِ وَمِمَّا يَعْرِشُونَ ﴿٦٨﴾

Indeed, Allah is the One Who causes seeds and fruit stones to sprout. He brings forth the living from the dead and the dead from the living. That is Allah! How can you then be deluded from the truth?

[Surah Al Ana'm 6:95]

﴿٩٥﴾ إِنَّ اللَّهَ فَالِقُ الْحَبِّ وَالنَّوَىٰ يُخْرِجُ الْحَيَّ مِنَ الْمَيِّتِ وَمُخْرِجُ الْمَيِّتِ مِنَ الْحَيِّ ذَٰلِكُمُ اللَّهُ فَأَنَّى تُؤْفَكُونَ

When to instil it: In the middle of the lesson

Soft board Display: Images of flowering and non-flowering plants

Instructional Stages:

Warm-up Activity: Teacher will collect some flowers for the class and will ask them to look at them carefully:

- Do all plants bear flowers?
- Why?

Direct Instructions: Teacher will discuss with students:

- Plant: Flowering and Non-flowering (Can be used as soft board material)
- Role of flowers
- Seeds in non-flowering plants

Vocabulary

coriander

mustard

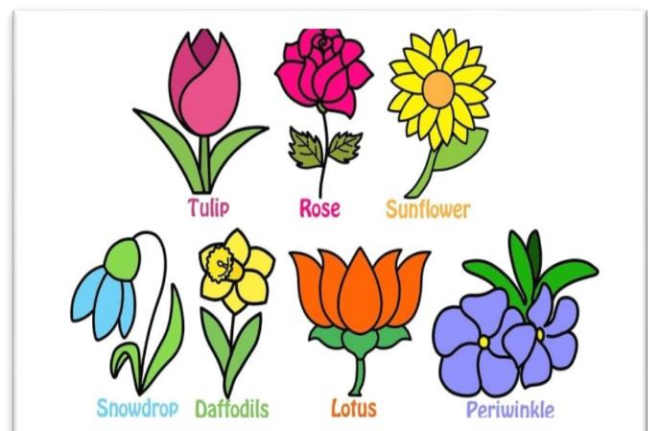
sprouts

soil

photosynthesis

stomata

process



Guided and Independent Learning: Through class discussion:

- Plants will be classified into two main groups. Angiosperm-Flowering plants-produce fruits with seeds inside
- Gymnosperm-Non flowering plants- produce seeds in cones etc. and they don't have fruit.
- Learners will collectively list down examples of flowering and non-flowering plants and teacher will help them with it on the board.
- Role of flowers. When no flower present, there will be no fruit.
- Formation of seeds in non-flowering plants.


Class Work: Do Q1, 2 and 3 of STOP AND ASK YOURSELF.

Home Assignment:

- Do Ex 4 in textbook.
- Draw pictures of 3 flowering and 3 non-flowering plants in the notebook

Note: Bring a small planting pot for the activity.

Grouping Plant:
I. Type the name of these plants below into the correct group.



Flowering Plants	Non-Flowering Plants

Suggested Videos for this Lesson

Flowering and non-flowering plants: <https://www.youtube.com/watch?v=tDrbTf5--Zw>



Lesson 3: Classification of plants Parts of a plant

Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- Plant a seed
- Identify parts of a plant (leaves, stem, flowers, seeds, roots)

Teacher's Resources:

- Potting soil
- Seeds
- Few previously sprouted plants (seedlings) or its picture otherwise.
- Soft board display
- Explore Your World – Science Book IV



Islamic Integration: Planting a tree is Sadqa-e-Jaria (hadith).

When to instil it: _____

Soft board Display: Image given

Instructional Stages:

Warm-up Activity: Teacher will ask and discuss with students about the steps of planting a plant.

Guided and Independent Learning:

1. In groups students will plant their seeds.
2. Teacher will let the kids observe parts of a previously grown seedling.
3. Through soft board display main parts of a plant will be reinforced
4. Roots will be discussed in details.

Class Work: Learners will write down their planting experience.

Home Assignment: Read the lesson thoroughly for class quiz.

Lesson 3: Classification of plants Parts of a plant-II

Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

1. Identify main parts of a plant
2. Relate parts of a plant to its functions.

Teacher's Resources:

- Quiz questions
- Soft board display
- Explore Your World – Science Book IV

Islamic Integration: Studying science enables us to know our creator more clearly; who has designed everything exquisitely. Holy Quran frequently reminds how His creatures carry signs for the people of wisdom.

When to instil it: _____

Soft board Display:

Instructional Stages:

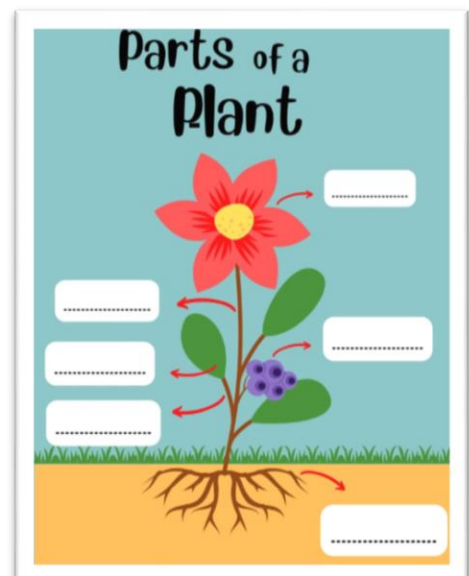
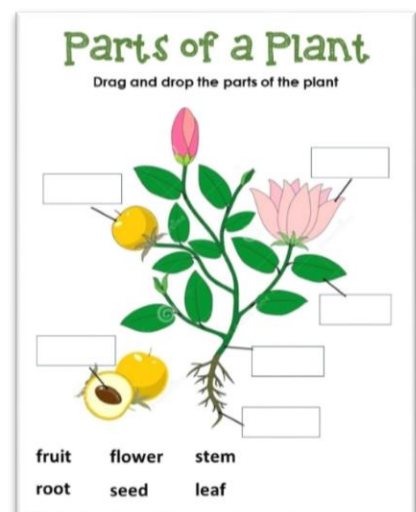
Motivation: A class quiz will be taken. Class will be divided into 3-4 teams and teacher will conduct the quiz.

Guided and Independent Learning:

- Students will recall parts of a plant through soft board display.
- Role of stem - carries salts and water to leaves and prepared food to all parts.
- Roles of leaves - preparing food for plants
- Flowers bear fruits and seeds

Table of numbers of seeds will be filled in book.

- **Class Work:** Q4 and Q5 STOP AND ASK YOURSELF in the notebook.



- **Home Assignment:** Students will:
- Do Ex 1 and 2 in book.
- Do Ex 5 in notebook.

Suggested Videos for this Lesson

<https://www.youtube.com/watch?v=X6TLFZUC9gI>



STOP AND ASK YOURSELF

Q. 1: Name some flowering and some non-flowering plants.

Ans: Flowering plants:

Flame
Rose
Blossom Apple

Non-Flowering plants:

Ferns
Pines
Cypress

Q. 2: What is the importance of flowers?

Ans: Flowers are very important part of the plants. They produce seeds while the inner part of the flower turns into fruit to protect the seed.

Q. 3: How do non-flowering plants make their seeds?

Ans: Non flowering plants either produce spores or cones which contain seeds.

Q. 4: Which part of the plant do you think is more important? Give reasons for your answer.

Ans: I think the leaves are the most important part of a plant. As they make the food for plants to perform all other activities. (Answers may vary. Teacher should openly accept different answers that provide a valid reason.)

Q. 5: Write the function of leaves and stem in the plants.

Ans: Function of leaves

The leaves prepare the food for the plants by a process called photosynthesis.

Function of stem

Stem carries water and minerals absorbed by the roots to the leaves. It also carries the food made by the leaves and water to various parts of the plant.

It is sort of a ladder for a plant to supports the other parts to reach closer to sun.

EXERCISES

1. Fill in the blanks.

- Plants are living things but they cannot move like animals.
- Some animals are so tiny that they cannot be seen by naked eyes.
- The vertebrates have a definite shape of the body because of their skeletal system.

- Warm blooded animals have protective **layer** to keep them warm.
- Invertebrates' breath through their **skin**.
- **Root** is the part of plant under the soil and keeps the plant anchored.
- The parts of plant that bear **fruits** and seeds are the flowers.

2. Write if statement is True or False.

- | | |
|--|-----|
| i. All animals have an immune system to save them from germs. | (F) |
| ii. Warm blooded animals have the same body temperature in winter and summer. | (T) |
| iii. Invertebrate do not have a backbone or skeleton. | (T) |
| iv. Non-flowering plants do not produce seeds. | (F) |
| v. Stem carries water and minerals from the soil to other parts of the plants. | (F) |

3. Sort out the vertebrate animals and non-vertebrate animals in the following;

Vertebrate

Elephant
Cat
Hen
Fish
Frog

Non-Vertebrate

Star fish
Butterfly
Earthworm
Crab
Cockroach

4. Identify the flowering plants and non-flowering plants.

Figure 1 Non-flowering plant (Kingly check according to the book)

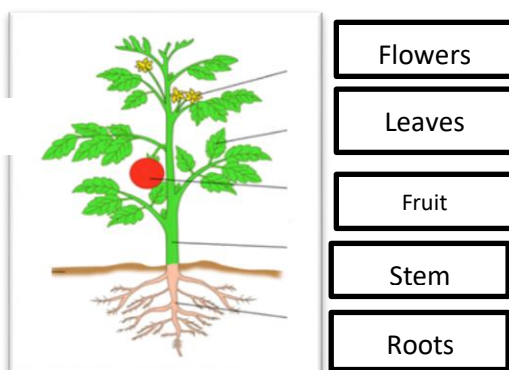
Figure 2 Flowering plant

Figure 3 Non-flowering plant

Figure 4 Non-flowering plant

Figure 5 Flowering plant

5. Label the following parts of the plants. Also write the function of each part.



Unit 02: Our Body at Work

SNC Learning Outcomes for Unit 02

All the students should be able to:

- Describe that human body has a number of systems working in it.
- Describe that each system has parts that work together to carry out a particular function.
- Identify major parts/organs in animals (teeth, bones, lungs, heart, stomach, muscles, brain etc).
- Relate the parts/organs of body of animals to their functions (e.g., teeth break down food, bones support the body, lungs take in air, the heart circulates blood, the stomach helps to digest food, muscles move the body).
- Describe how human body grows.
- Explain the growth pattern of the human body.

Watch Your Heart Work

Estimated Time Required: 40 minutes

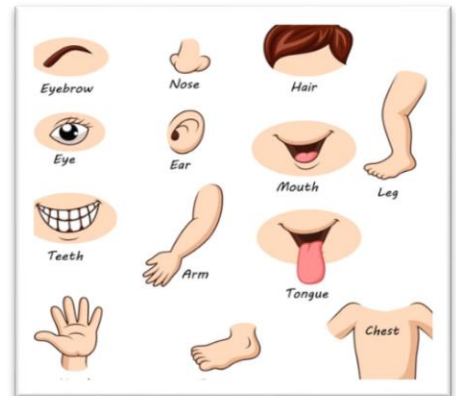
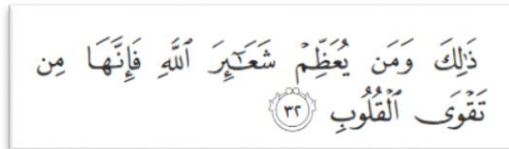
Objectives: Students will insha'Allah be able to:

- Record pulse.
- Name external organs in the human body and associate them to their functions.

Teacher's resource:

1. Watches
2. Soft board Display
3. ERI-Science Book IV

Softboard Display: Images given



Islamic Integration: Allah SWT had created human beings with extraordinary skills, abilities and complex parts. We should be thankful to ALLAH S.W.T for this. Always be grateful to Allah SWT.

That is so. And whoever honours the symbols of Allah, it is certainly out of the piety of the heart. [Al Hajj: 32]

When to instil it: _____

Instructional Stages:

Warmup activity: In pair learners will note the pulse of their partner as explained in the book with teacher's guidance.

Vocabulary

pump

movement

beating

vibrate

Direct Instructions:

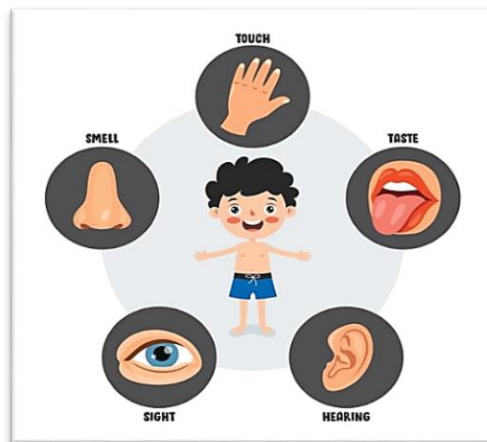
1. Teacher will discuss with class parts of human body especially the external organs: eyes, nose, ear, hands, legs etc.
2. Students will understand the terms internal and external organs.

Guided and Independent Practice - Activity time:

- Learners will feel the pulse of their partners, with teacher's assistance.
- Using wrist watches, learners will note down their pulse in their books.
- Teacher will relate how the vibrating pulse shows the rate of heart beat.

Class Work: Table of external organs and their functions will be done in book.

Home Assignment: Do Q1 STOP AND ASK YOURSELF lesson 1 in your notebook.



Lesson 1: Our Body and Its Systems

The Human Body | Digestive System

Estimated time required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- List down different systems working inside the human body.
- Name the main organs involved in the digestive system.
- Associate the breakdown of food with the organs in the digestive system.

Teacher's Resources:

1. Soft board display
2. Model/ large drawing of human torso
3. Digestive system cut out organs (3-4 each)
4. Other organs (not related to digestive system)
5. Explore Your World – Science Book IV

Soft board Display: Image given

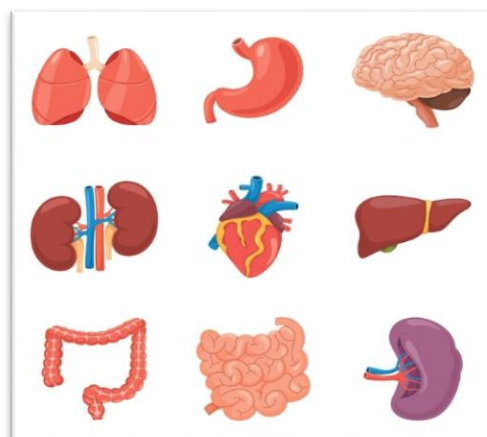
Refer to the pictures given on page 14 or teacher can display models if available.

Islamic Integration: Human beings are the creation of the great creator. Studying the details of human body enables us to be more thankful and show much more gratitude towards Our Lord.

(Saying) Eat from the good things We have provided for you, but do not transgress in them, or My wrath will befall you. And whoever My wrath befalls is certainly doomed.

[Surah Taha: 81]

Vocabulary
organ
machine
external
internal
digest
digest



When to instil it: _____

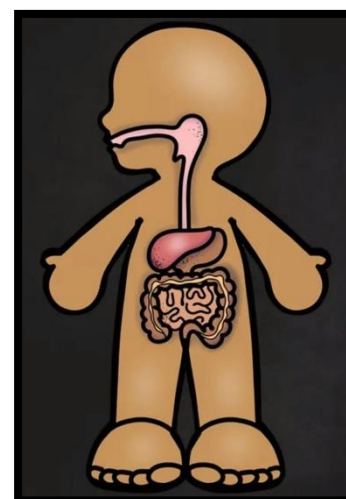
Instructional Stages:

Warm up Activity: Human Torso will be demonstrated (if available) or soft board display otherwise. Teacher will ask students to identify them and tell what's connected to what. Concept map will be made on the board.

Direct Instructions: Teacher will discuss the following points:

- Organ system - Human body as a series of organ system.
- Major internal organs:
 - Brain
 - Heart
 - Lungs
 - Stomach
- Organ systems: Organ system- a team of organs works together to run each system in the body, performing special jobs. 5 main organ systems will be listed with students' engagement.
 - Digestive system
 - Circulatory system
 - Respiratory system
 - Nervous system
 - Skeletal system
- Digestive system: Stomach – an internal organ associated with digestion of the food we eat. It is connected with a series of organs that help it perform.
 - Parts of digestive system
 - Jobs of digestive system

Vocabulary
break down
distribute
food pipe
intestine



Guided and Independent Practice - Activity time:

Students will work in groups to build a System: Students will use the cut out organs to build digestive system and tell how organs are connected. By now they should be able to know which organs are part of digestive system and which are not.

Class Work: Q2 from STOP AND ASK YOURSELF will be done in the notebook.

Home Assignment: Students will do Q3 STOP AND ASK YOURSELF lesson 1 in the notebook.

Suggested Video:

Digestive system: <https://www.youtube.com/watch?v=ZBZWgrfZFbU>
<https://www.youtube.com/watch?v=3pjkQcQBTtc>



STOP AND ASK YOURSELF

Q 1. What is pulse rate?

Ans. Pulse tells us our heart is beating. Pulse rate tells us number of time it beats in a minute.

Q 2. Name the different systems in the human body.

Ans. The different systems in the human body are:

- i. Digestive System

- ii. Circulatory System
- iii. Respiratory System
- iv. Nervous System
- v. Muscle and Skeletal System

Q 3. What is the name of the system responsible for digestion of food? What are the names of the different parts that make up this system?

Ans. The system responsible for digestion of food is Digestive System. The parts that make up digestive system are: Mouth, food pipe, stomach, intestines, liver

Q 4. How do food and oxygen reach all parts of the body?

Ans. The blood carries oxygen and nutrients to all parts of the body.

Q 5. What is the job of the respiratory system?

Ans. The job of the respiratory system is to take oxygen and removes carbon dioxide from the body.

Lesson 1: Our Body and Its Systems Circulatory and Respiratory Systems

Estimated Time Required: 40 minutes

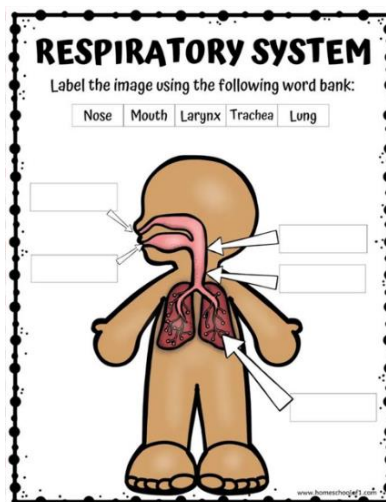
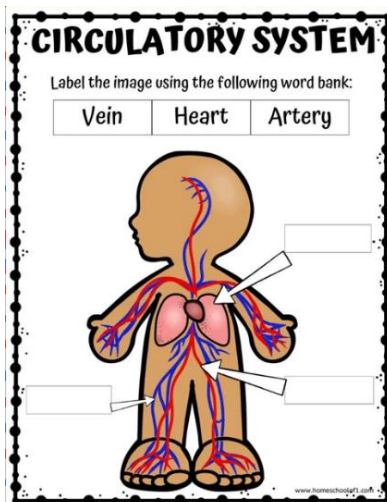
وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ سُلَالَةٍ مِّن طِينٍ

Lesson Objectives: By the end of this lesson, students will be able to:

- Name the main organs involved in the circulatory system, respiratory system.
- Recognise circulatory system as a transport mechanism.
- Recognise the job of respiratory system.

Teacher's Resources:

1. Soft board display
2. Model/ large drawing of human torso
3. Digestive system cut out organs (3-4 each)
4. Other organs (not related to digestive system)
5. Explore Your World – Science Book IV



Vocabulary

tubes

vessels

veins

arteries

nutrients

oxygen

carbon dioxide

lungs

Soft board Display: Images are given to use. Besides, pictures on page 15 and 16 can be used for it.

Islamic Integration: Prophet S.A.W. used to say: "All praise belongs to God who took out from me that which harms me and left in me that which benefits me."

And certainly did We create man from an extract of clay. [Al Mu'minun: 12]

When to instil it: _____

Instructional Stages:

Warmup Activity: Probing questions will be asked:

1. After digesting our food, how does our bodies use it?
2. Other than food, what do we need to live?
3. How do we get it?

Direct Instructions:

- Circulatory system - transport system - Heart - pumping organ in the body. Works with a series of organs to transport things in the body.
- Respiratory system – provides oxygen - Oxygen we breathe in; carbon dioxide we breathe out.
- Nervous System - transmit messages -take action - maintains a contact system in the body lets you feel and respond. Learning is also carried out by the nervous system.

Guided and Independent Practice – Activity time

Teacher will share unlabelled handouts to students and they will label them.

Class Work: Students will do Q4 and Q5 of STOP AND ASK YOURSELF in the notebooks.

Homework Assignment: Read lesson 1 Unit 2, thoroughly for class quiz.

Suggested Video: Respiratory System <https://www.youtube.com/watch?v=mOKmjYwfDGU>

Circulatory System <https://youtu.be/i1DYbsxPYrg?si=1GOrX1mjHbaj-i6C>



Lesson 1: Our Body and Its Systems Nervous, Muscular and Skeletal Systems

Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- Recognize the importance of bones in our bodies.
- Highlight that muscles are attached with bones to help them move.

Teacher's Resources:

1. Soft board display
2. Model/ large drawing of human body
3. Explore Your World – Science Book IV

Vocabulary
transmit
spinal cord
nerves
upright
skeleton

Soft board Display: : Images are given to use. Besides, pictures on page 15 and 16 can be used for it.

Islamic Integration: Smile-it's a Sunnah of our beloved Prophet SAW and is a Sadaqa from the beholder.

When to instil it: _____

Instructional Stages:

Warmup Activity: Teacher will ask, “Do you know how you are able to walk upright? How are you able to lift yourself off the bed when you get up in the morning?”

Direct Instructions: Discussion about nervous, muscular and skeletal systems

Skeletal system provides our bodies the required support to stand upright. Teacher will provide the names of major bones in the body.

Muscles are attached with bones. They are responsible for all movements in the body.

What roles does nervous system play?

Guided and Independent Practice – Activity time

A short class quiz will be carried out to review all learnt concepts.

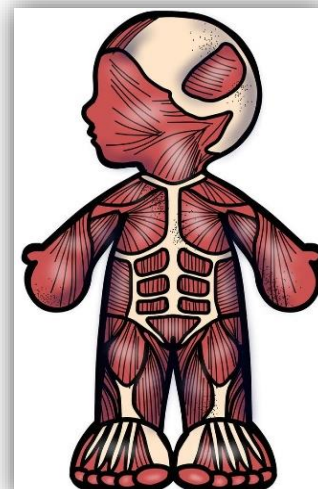
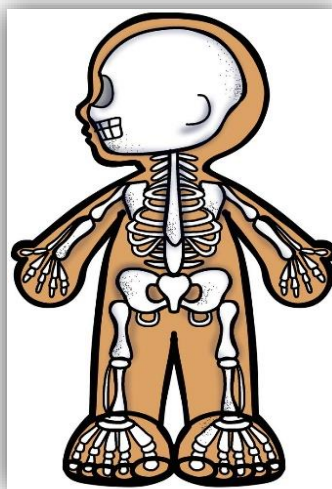
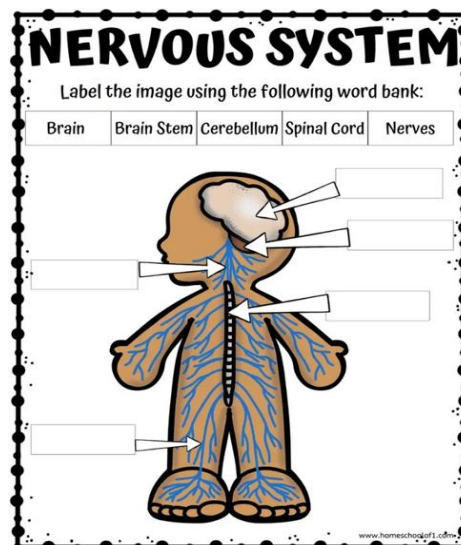
Class will be divided into groups, each representing an organ system. They will carry out their role plays one by one.

Simon says: Teacher will give instructions: Simon says: touch your clavicle/ patella/ tibia bone. etc.

Written work: Students will do Ex I and II in the notebook.

Home Assignment: Do Exercise III in book.

Students will be preparing for role plays so they will be divided into groups, representing different organ systems. Teacher should make sure that all students are included. They can base their role plays on an illness causing trouble for an organ etc.



Suggested Videos:

Nervous System: <https://www.youtube.com/watch?v=6O-0CVAgaEM>

Skeletal System: <https://www.youtube.com/watch?v=ywDOiNEdJVc>

Muscular System: <https://www.youtube.com/watch?v=Emox3Uo01C0>



Vocabulary
facial muscles
respiratory
circulatory
nervous
supply

Lesson 1: Our Body and Its Systems

Systems work as Teams



Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- Clarify the jobs of various organ systems in our bodies.
- Present their work

Teacher's Resources:

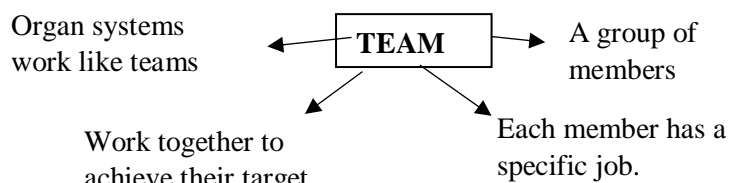
1. Name tags for role plays
2. Explore Your World – Science Book IV

Soft board Display: _____

Islamic Integration: Every creation of Allah SWT knows their responsibilities and they carry them with dedication. Like sun, moon, rain, clouds, birds. Similarly each organ in the body is given a responsibility that they perform with full dedication. SubhanAllah.
When to instil it: _____

Instructional Stages:

Warmup Activity: Through this diagram, teacher will ask student's existing knowledge.



Direct Instructions: Teacher will discuss the table given on page 17 to check knowledge.

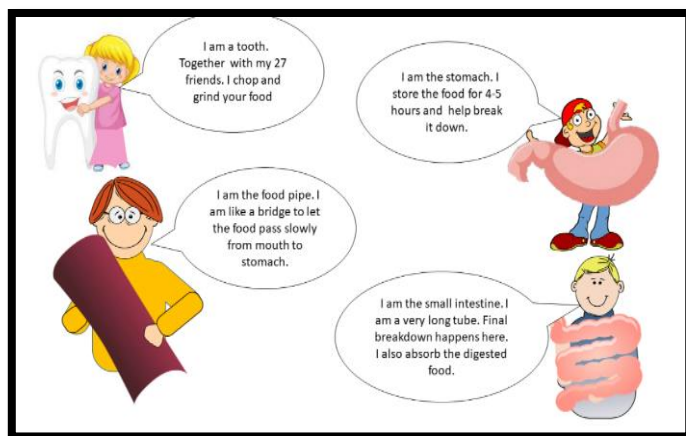
Sample for role play *Digestive System*

Guided and Independent Practice – Activity time:

1. Teacher will distribute name tags for the organs to all participating students.
2. Learners will work together in their designated groups to present their role plays.
3. Students will use props if needed.

Class Work:

No written work for this lesson will be given.



Home Assignment:

1. Search about human teeth for the project work.
2. Bring a chart paper and art stuff for project work.

Lesson 2: How Our Body Grows
Growth of the Human Body | How does Growth Occur**Estimated Time Required:** 40 minutes**Lesson Objectives:** By the end of this lesson, students will be able to:

- Identify growth patterns in the body.
- Observe daily life examples of growth.

Teacher's Resources:

1. Height chart/ Weighing Scale
2. Soft board display
3. Explore Your World – Science Book IV

Soft board Display: Height and Weight Chart**Islamic Integration:** The Holy Qur'an also uses the word 'Barakah' for Earth (41:10). The Earth, fittingly, remains stable in its place and is a source of nourishment, growth, and development for everything and everyone.**Vocabulary**

growth

cells

develop

When to instil it: _____

Instructional Stages:

Warm up Activity: Teacher will gather students of different height and will introduce the topic, stating the fact that each and every child has different growth pattern and different growth rate.

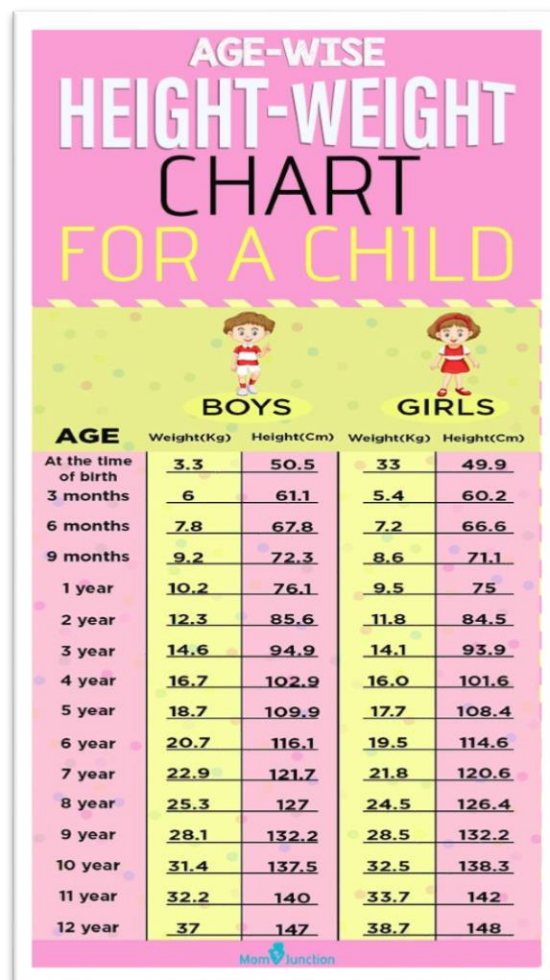
Direct Instructions: Teacher will discuss following points:

- Growth of the Human Body - Growth-increase in size occurs rapidly in infants and slows down gradually from toddlers to teens. The growth in size (height) stops at the adult stage.
- Learners will discuss the growth of nails and hair continues throughout life.
- Different Parts, Different Growth - Our skin also keeps refreshing and injuries heal and that also is a type of growth.
- How growth does occur? Method of growth via cell division will be discussed.

Guided and Independent Practice – Activity time

Students will find out their weight and height and will calculate their BMI at homes.

Students will attempt a Quiz to check for their understanding.



(<https://quizizz.com/admin/quiz/5cf7255552afed001cf836c4/growth-and-development-grade-4>)

Class work: Students will do Q1, Q2 and Q3 STOP AND ASK YOURSELF lesson 2 in notebook.

Home Assignment: Students will be doing Ex IV in the notebook. Students will do research on “Human Teeth”. Question given in the book will help.

Posters to be made in the next class: Our Teeth: why they are important and how we can care

Lesson 2: How Our Body Grows Different Parts, Different Growth Project Work

Estimated Time Required: 40 minutes

Lesson Objectives: By the end of this lesson, students will be able to:

- Recognize different types of teeth in our mouth.
- Understand the need of secondary teeth.
- List down the jobs of different teeth in our mouth.

Teacher's Resources:

1. PPT/ video
2. Multimedia (as available)
3. Library books

Soft board Display: Image given

Islamic Integration: Our Prophet ﷺ would cut his nails every fifteen days on a Friday. He would start with the right hand. He would cut nails of the fingers before the toes.

When to instil it: _____

Instructional Stages:

Warm up Activity: Teacher will ask the learners about the information they collected for their projects.

Direct Instructions:

1. Learners will be shown a presentation/ video to answer their queries.
2. Through review questions content will be revised.

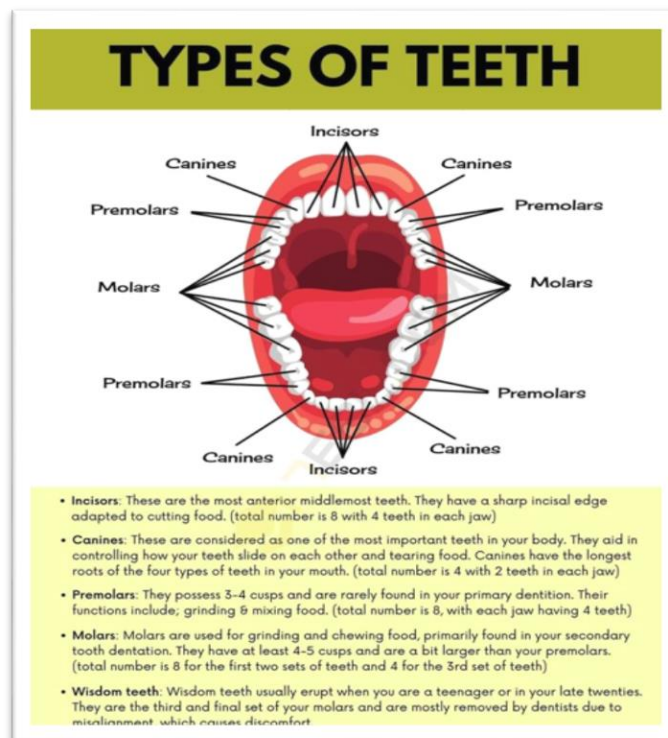
Guided and Independent Practice – Activity time

Learners will individually design their posters based on the research they have done.

Class work: Posters will be designed.

Home Assignment: Make a chart for 30 days and paste it on your washroom's door. Mark a tick of brushing your teeth twice a day to keep your teeth healthy and strong.

Suggested Video: <https://www.youtube.com/watch?v=tvCeSX9Pthw>



STOP AND ASK YOURSELF

Q. 1: Do all parts of human body grow in the same way?

Ans: Different parts of body grow at different speeds at different times in our lives. Some parts and areas of our body grow faster than the others. There are also some parts of the body which do not grow at all after birth for example the eye.

Q. 2: How long does the human body grow?

Ans: We grow in height from birth to adulthood.

Q. 3: How do cells take part in the growth of the human body?

Ans: All cells need oxygen and nutrients to grow. They grow and divide into two similar cells. The new cells again grow with the help of oxygen and nutrients.

Exercise

I. Which systems of our body enable us to do the following?

Ans: The following systems of our body enable us to do different tasks:

- a) Nervous System and Muscles and skeletal system
- b) Nervous System and Muscles and skeletal system
- c) Nervous System and Muscles and skeletal system

II. Make three riddles about different systems of the body and ask your friends to guess the answers.

Ans: Three riddles about different systems of the body:

1. I squish, squish and squish your food
When you eat well you are in happy mood; Who am I?
1. I let you stand, I let you walk
I let you frown, I let you talk; who am I?
2. I have a pump, as little as your fist,
I ride your things as on the list; who am I?
3. I have tiny hair to dust off the air
Things are in pair, here and there; who am I.
4. I transport goods 24/7: we never stop,
My rides are available, round the clock; who am I?
5. All messages ring to me, whether big or small,
I decide, there's no toll, on any call: who am I.

III. Match the columns. The first one has been done for you:

System	Parts of the System	Function/Purpose	
1. Digestive system	a. Brain, spinal cord and nerves	i. Provides support and helps us to move	1 , d , iii
2. Respiratory system	c. Skeleton and muscles	ii. Transfers messages between brain and other parts of the body.	2 , f , iv
3. Circulatory system	d. Mouth, food pipe, stomach, intestines, liver	iii. Breaks down food into small particles	3 , e , v
4. Muscles and skeletal system	e. Heart, blood, veins and arteries	iv. Takes in air and supplies oxygen to the blood, removes carbon dioxide from the blood and then out of the body.	4 , c , i
5. Nervous system	f. Nose, lungs and system of tubes connecting them	v. Carries food and oxygen to all parts of the body; removes waste from all parts of the body.	5 , a , ii

IV: How does growth happen in our body?

Ans: Growth occurs by cells division. From birth till adulthood the height grows by growing muscles and bones. Our hair and nails keep growing throughout our lives. Our eyes never grow.

Unit 03: Ecosystems

SNC Learning Outcomes for Unit 03

All the students should be able to:

- Recognise and define what is an ecosystem (e.g., forests, ponds, rivers, grasslands and deserts).
- Explain biotic (plants, animals and humans) and abiotic factors (light, temperature, soil and water) and their linkages
- Describe a few food chains and analyse their structure to understand the function.
- Describe the roles of living things at each link in a simple food chain (e.g. plants produce their own food; some animals eat plants, while other animals eat the animals that eat plants).
- Identify and describe common predators and their preys.
- Construct a food chain.
- Differentiate between producers, consumers and decomposers.
- Differentiate between primary, secondary and tertiary consumers.
- Recognise the value of a balanced ecosystem.
- Interpret those human actions such as urbanisation, pollution and deforestation which affect food chains in an ecosystem.
- Identify various actions and roles that humans can play in preserving various ecosystems.

Lesson 01: What is an Ecosystem?

Estimated Time Required: 2 lessons of 40 minutes

Objectives: Students will In-Sha-Allah be able to:

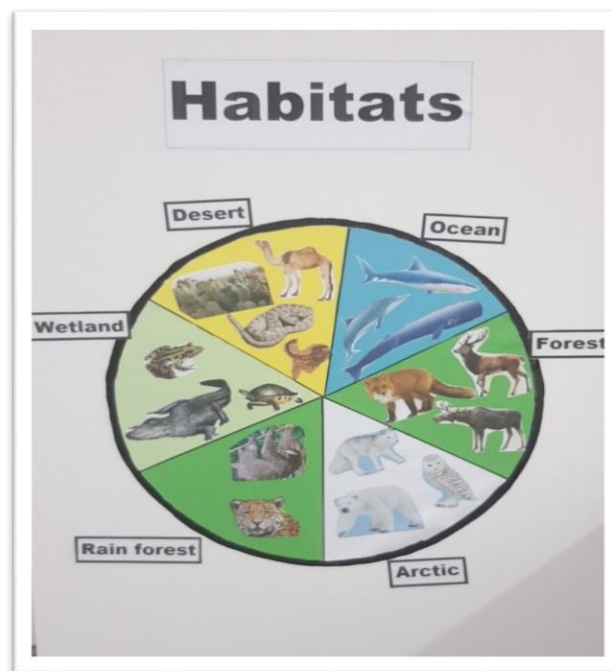
- Recognize and define what is an ecosystem (eg: forests, ponds, rivers, grasslands and deserts)
- Explain biotic (plants, animals and humans) and abiotic factors (light, temperature, soil and water) and their linkages

Teacher's resource:

1. Soft board Display
2. Explore Your World – Science Book IV

Soft board Display: Image given

Islamic Integration: Allah SWT has created a diverse universe. Each organism is different. There is a great variety of organisms. All the beauty and details lead us to find the only Lord. It's only Allah, the true creator who every time **creates** new and diverse creations.



The true servants of the Most Compassionate are those who walk on the earth humbly, and when the foolish address them 'improperly', they only respond with peace.
[Surah Al Furqan: 25:63]

وَعِبَادُ الرَّحْمَنِ الَّذِينَ يَمْشُونَ عَلَى الْأَرْضِ هَوْنًا وَإِذَا خَاطَبَهُمُ الْجَاهِلُونَ قَالُوا سَلَامًا



The Holy Qur'an also tells us to walk gently on the earth. American Muslim scholar Imam Zaid Shakir says this verse emphasizes doing the least amount of damage to the environment during our lifetime.

When to instil it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Show the image to students and ask them to names of different habitats. Teacher can also ask three students to come forward. They will think of an animal in their surrounding/ a pet and the class will help them list down 10 things about its living.

Direct Instructions:

Teacher will discuss about:

- Ecosystem (Example: Forests, Ponds, Rivers, Grasslands and deserts) - any setting where living things interact with their
- surroundings is an **ecosystem**,
- Biodiversity- variety of living organisms - In a single garden we can notice many different birds; they vary in their color, size, appearance, food, homes. We can say they are very diverse.
- Biotic factors (plants, animals, humans)
- Abiotic factors (light, temperature, soil and water)

Guided and Independent Practice – Activity time:

Students and watch a video and try to remember information:
<https://www.youtube.com/watch?v=y18o0mACCQs&t=14s>

Class Work:

- Q2 and Q3 will be orally discussed.
- Students will list down living things from the given picture in book. Complete the table for biotic and abiotic components in the book.

Home Assignment:

Read lesson 1: 'What is an ecosystem', and note down the definitions of:

- Ecosystem
- Biotic factor.
- Abiotic factor
- Biodiversity



Vocabulary

ecosystems

components

disappear

bio-diverse

balance

habitat

Suggested Video:

Habitat: <https://www.youtube.com/watch?v=p3PX1x6scbA>

Ecosystem: <https://www.youtube.com/watch?v=sKJoXdrOT70>



Lesson 01: What is an Ecosystem?

Biotic and Abiotic Factors

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Interpret the influence of abiotic factors like sunlight, water etc. on the ecosystem.

Teacher's resource:

1. Nearby garden
2. Soft board Display
3. Explore Your World – Science Book IV

Soft board Display: Images given

Islamic Integration: Allah SWT, is the creator of this entire universe. All his creations living and non-living, are busy fulfilling their responsibilities.

When to instil it: at the beginning of the lesson



Instructional Stages:

Warmup Activity: Teacher will discuss:

‘When there is no sunlight the plants and eventually all animals will die out and how it would affect humans and why?’

Direct Instructions: Teacher will discuss about influence of abiotic factors.

Guided and Independent Practice – Activity time:

Learners will visit a nearby garden (if possible) to observe a real ecosystem. In other case, teacher can bring a large chart sheet with a biodiverse ecosystem on it and discuss.

Teacher will provide students with worksheets showing different ecosystems and they'll identify biotic and abiotic factors.

Class task: Q1 and Q3 STOP AND ASK YOURSELF Lesson 1 in notebook and will complete Ex IV in notebook.

Home assignment: Do Q2 STOP AND ASK YOURSELF lesson 1 in your notebook.

Project:

Teacher will motivate the learners to come up with their creativity and thoughts to make a poem using:

- Ecosystem
- Biodiverse

Vocabulary

biotic

abiotic

fungi

bacteria

interaction

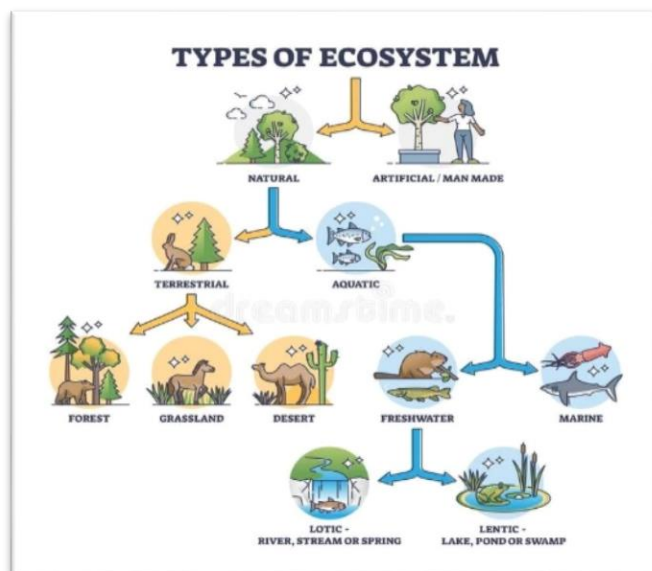
pollination

- Biotic factors
- Abiotic factors



Suggested Videos:

Biotic and Abiotic Factors: <https://www.youtube.com/watch?v=qJr1p55rT5M>

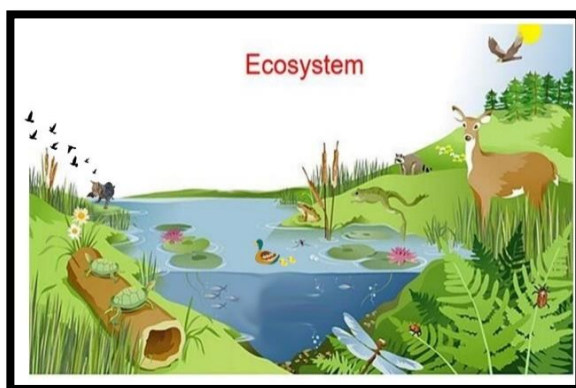


STOP AND ASK YOURSELF

Q.1: Use the definition of the following terms to write a poem on ecosystems:

- a) ecosystem b) bio diverse c) bioticd) abiotic

Q. 2: Make the pictures to show the effects of two abiotic factors on biotic factors.



Q. 3: Name a small ecosystem in your neighbourhood. Describe the biotic and abiotic elements present in it.

Park Ecosystem

Biotic: cat, dog, crow, sparrow, butterfly, ant, grass hopper, pigeon.

Abiotic: sand, rocks, pebbles, rotten food, plastic bottle, paper waste, sunlight, plastic shoppers.

Lesson 02: Food Chain

Feeding Relationships

Various links in the food chain

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Describe a few food chains and analyse their structure to understand its function.
- Describe the roles of living things at each link in a simple food chain (e.g., plants produce their own food; some animals eat plants, while other animals eat the animals that eat plants).
- Identify feeding relationships
- Understand a food web is formed by the interconnection of different food chains.

Teacher's resource:

- Name tags for the game 'Food Chains' – biotic and abiotic factors
- Soft board display
- Explore Your World – Science Book IV

Soft board Display: Image given

Islamic Integration: In Quran ALLAH says, "And as to the Earth-it is HE alone who has laid it down for all living creatures."

When to instil it: at the beginning of the lesson

Instructional Stages:

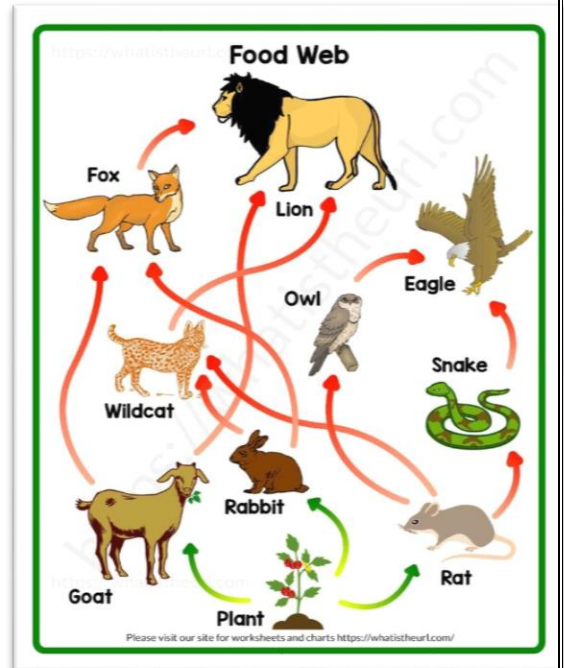
Warmup Activity: Teacher will distribute name tags of different animals, plants and humans and will briefly define food chains to students so that they can play the game well.

Direct Instructions:

Food Chain and Feeding relationships in food chains - Various links in a food chain will be discussed with examples and students will identify producers, primary, secondary and tertiary consumers in the provided food chain.

1. Links in a food chain
2. Food web

Q. Complete the following food chains.



Vocabulary

food chain

extinct

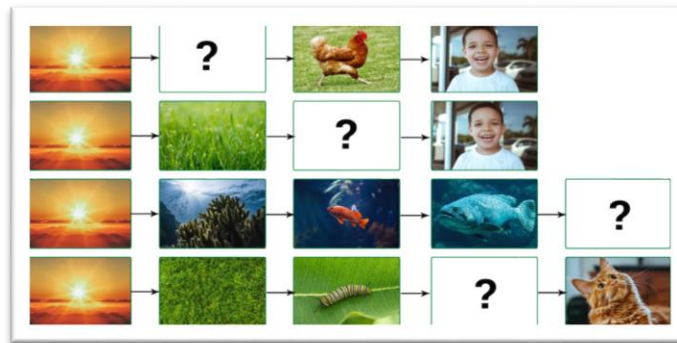
energy

consumers

primary

secondary

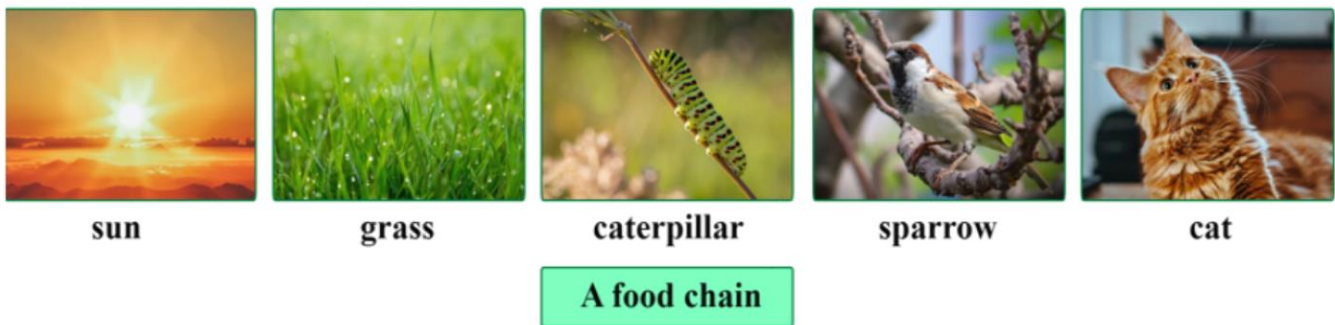
tertiary



Ans.

- a) Sun → Fruits and Vegetables → Chicken → Human
 b) Sun → Grass → Goat → Human
 c) Sun → Aquatic plants → Small fish → Big fish → Human
 d) Sun → Plants → Caterpillar → Birds (Cuckoo) → Cat

Make a food chain of any two animals like this:



Ans. Sun → Plants → Cow → Human

Guided and Independent Practice – Activity time:

- Students will complete the missing parts of the food chains given in book and will relate the formation of a food web by linking various foods chains.
- Teacher will distribute name tags and children will play ‘Food Chain’.

Food Chain game – Duration 10 minutes

Tags for: Lion, Human, Grass, Earthworm, Eagle, Hen, Water, Sparrow, Apple, Crow, Goat, Deer, Tiger, Cat, Dog, Whale, Krill, Sea Weeds and more

Teacher must try to include all the class in this game.

Students find their prey. If they catch a prey, they stand with it hand in hand, making a chain. For example, if grass is eaten by goat, they stand together. Then lion/ human eats the goat and they add a link to the chain.

Different chains will be formed like this.

Class Work: Ex I a and b in note book. Students will also complete Q 1 and 2 “*Stop and Ask yourself*”; lesson 2 in note book.

Home Assignment:

Project work

Make a booklet of 5 animals and their eating habits. Draw food chains related to them. Teacher must share clear instructions regarding this project to the students and give them a week to submit.

Suggested Video:

Food Chain: <https://www.youtube.com/watch?v=YuO4WB4SwCg>



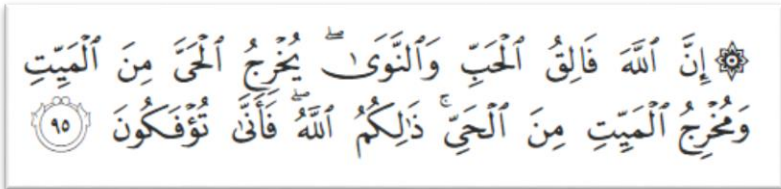
Lesson 02: Food Chain

Decomposers

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define Decomposers
 - Identify predators and prey in feeding relationship.
- List down the effect of changes in the weather and climate on the overall ecosystem of a place.



Allah splits the seed and kernel. He brings forth the living from the dead, and produces the dead out of the living. That is Allah, so how are you misguided? (Qur'an, 6:95)

Teacher's resource:

1. Soft board Display
2. Explore Your World – Science Book IV

Soft board Display: Images given

Islamic Integration: Allah SWT has taught us to bury the dead bodies of our loved ones into the soil to decay.

When to instil it: at the beginning of the lesson













Instructional Stages:

Warm up Activity: Why do we bury the dead? What are the benefits of doing this?

Direct Instructions: Teacher will discuss the following points:

Decomposers: Importance of decomposers and decomposition for our environment will be discussed, that enables the return of basic components back to the soil to be used again.

What Do I Eat?
Match the animal to its food.

 Owl	 Snowshoe Hare
 Bat	 Mouse
 Garter Snake	 Earthworm
 Bald Eagle	 Mosquito
 Bobcat	 Grasshopper
 Bullfrog	 Fish

@Sheri Amsel www.exploringnature.org

Vocabulary

decomposers

nutrients

fungi

earthworm

Predators and prey: The terms 'predators' and 'prey' will be discussed highlighting each in the previously discussed food chains.

Disturbance in the balance of an ecosystem: Effects on the organisms at different tropical levels of an ecosystem will be discussed in relation to changes that may occur in the weather and climate.

Like if there is a huge fire; initially it will burn more trees than animals, but ultimately affect the consumers step by step.

Guided and Independent Practice:

Compare three different ways of cremating the dead: **burying | burning | throwing**

Describe benefits of all three on the overall environment.

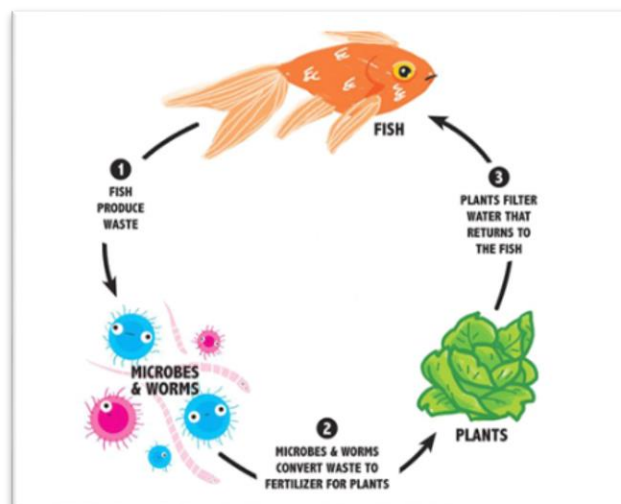
Class Work: Students will complete Ex III, Ex II and Ex IV in notebooks.

Home Assignment:

Q: Define: i) Food chain ii) producers iii) consumers iv) decomposers

Suggested Video:

Decomposers: <https://www.youtube.com/watch?v=8IYVxZop0C0>



STOP AND ASK YOURSELF

Q. 1: What is the feeding relationship between the following:

Ans: Feeding relationship between the following:

- Lions and deer (Lions eat deer)** Lion is the secondary consumer while deer is the primary consumer
- Hens and grains** Hens are primary consumers; grain is the producer.
- Grass and goats** Grass is producer, goat is primary consumer.
- Worms and Birds** Birds are consumer and worms are decomposers.

Q. 2: Make a food chain and identify different types of consumers in it.

Ans: Food chains and different types of consumers in them:

- Sun → grass → caterpillar → frogs → hawks →
 (producer) (primary consumer) (secondary consumer) (tertiary consumer)
- Sun → grass → grass hopper → frog → snake →
 producer > primary consumer > secondary consumer > tertiary consumer

Lesson 03: Balance within an Ecosystem

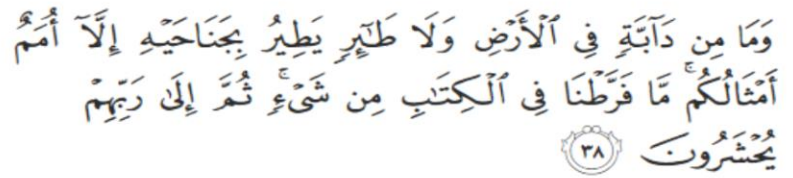
Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Name the human interventions that damage an ecosystem-
- List the ways to preserve our ecosystem
- List down the effect of changes in the weather and climate on the overall ecosystem of a place.

Teacher's resource:

1. Coloured or white A-4 sheets for task
2. Everyday use items – around 20
3. Soft board Display
4. Explore Your World – Science Book IV



Soft board Display: Image given

Islamic Integration: Rasoolullah SAW told us not to waste even a glass of water even if you are at a spring of running water.

When to instil it: at the beginning of the lesson

All living beings roaming the earth and winged birds soaring in the sky are communities like yourselves.1 We have left nothing out of the Record.2 Then to their Lord they will be gathered all together. [Al Anaam: 38]

Instructional Stages:

Warmup Activity: Students will be asked if they know about the 3 Rs of sustainability.

Direct Instructions: Teacher will discuss:

Effects on Ecosystem - Students will discuss a forest as a rich ecosystem and how will the change have influence over the producers, consumers as well as the non-living things in that ecosystem.

Ways to preserve our ecosystem - Human interventions like cutting trees and pollution will be discussed leading to extinction of some species and endangering will be discussed.

Concepts of 3 Rs and sustainability in the use of energy will be introduced.

Guided and Independent Practice – Activity time

Group work: Teacher will divide the class into groups and they will be handed over coloured sheets to work in groups. Each group will discuss the impact of a single change:

- Storm
- Fire
- Tsunami
- Drought

Activity 2: Teacher will give show students everyday use items. They will work in groups and will decide which items can be reused, which ones can be reduced and which ones can be recycled.

Class Work: Do Q1, Q2, Q3 and Q4 STOP AND ASK YOURSELF your notebook.



Vocabulary

climate

reduce

reuse

recycle

predator

prey

Home Assignment: Prepare a 3 min presentation to educate your friend to save the ecosystem. Teacher should give clear instructions to students along with timelines. They should cover:

- the benefits of energy conservation
- how to create awareness by making slogans to cut down on what we throw and try activities like reduce, reuse and recycle
- ways to conserve water.

Suggested Videos:

The 3 R's of Sustainability: <https://www.youtube.com/watch?v=c8YxL0KhXtl>



STOP AND ASK YOURSELF

Q. 1: Define the following:

Definitions:

- a. **Prey:** A prey is an animal which the predator eats. OR Prey is an animal that is caught and killed by another for food.
- b. **Predator:** A predator is an animal that eats another organism. An animal that hunts, kills, and eats other animals.

Q. 2: Mention some natural factors that affect the ecosystem.

Ans: Some natural factors that affect the ecosystem include: Weather and climate changes, storms, fire or the introduction of a population of some new organism.

Q. 3: Name four human activities that affect ecosystem.

Ans: Four human activities that affect the ecosystem:

An ecosystem can be affected by human activities like:

- Cutting of trees to develop residential areas
- Building industries
- Polluting the air by driving vehicles that give out harmful fumes etc
- Hunting

Q. 4: How can you educate your friends to save our ecosystem?

Ans: We can educate our friends with different presentations and charts about:

- the benefits of energy conservation.
- create awareness by making slogans to cut down on what we throw and try activities like reduce, reuse and recycle.
- discuss ways to conserve water.

Lesson 03: Balance within an Ecosystem

Review

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Review the learnt concepts.
- Present to educate friends to save the ecosystem.

Teacher's resource:

1. Quiz questions
2. Soft board Display

3. Explore Your World – Science Book IV

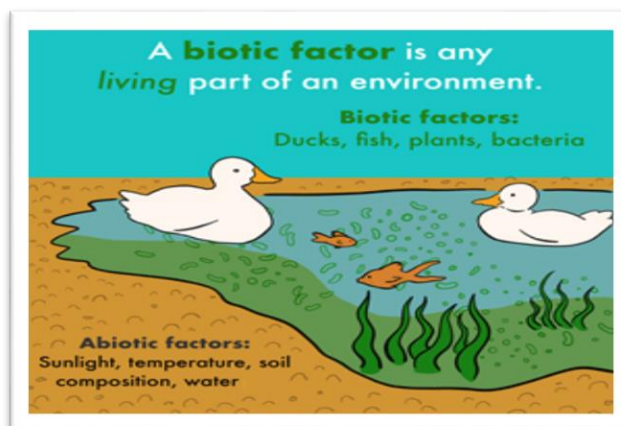
Soft board Display: Image given

Islamic Integration: ALLAH S.W.T has made the Earth a home for us and replenish it with all required resources. We are allowed to see them all, but not waste them.

When to instil it: at the beginning of the lesson

Direct Instructions: Teacher will conduct the Review Quiz.

Ex VI Give reasons part a, b will be discussed and Learners will write their own answers.



Guided and Independent Practice – Activity time

Learners will take turns to present their work to educate peers ‘Save the Ecosystem’.

Remaining presentations can be continued in the later classes.

Class Work: Class quiz

Home Assignment: Students will do Ex VI and VII in notebooks.

Instructions:

A. Study the picture given below and answer the following questions.

B. Living things in the picture: Ducks, Cat, Plants, Trees, Birds, Turtle, Squirrel

1. Some animals are eating plants. Some animals are eating other animals.
2. The birds are on the sky interacting with the environment. Ducks are in the water interacting with water bodies.

C. Fill in the gaps in the following table with the help of the picture.

Biotic	Abiotic	Interaction
Plants (leaves)	Sunlight	Photosynthesis (making food)
Plants (leaves)	Air	Breathing and taking CO ₂ for making food
Plants (roots)	Soil	Absorb water and minerals from the soil
Ducks	Water	Swimming
Fish	Water	Lives in water, swim
Bacteria	Soil	Makes the soil rich in minerals

EXERCISES

I. Use the information provided by the following pictures to construct a food chain.

Animals like chameleon, rats and snakes find their prey on trees. Earthworms feed on dead plants and animal remains to add value to soil.

V. This picture shows an earthworm feeding on dead leaves. Can you name and explain the process that is going on?

Ans: This process is called decomposition. Earthworms break them down dead remains into simpler components and return the nutrients back to the soil to be used again by the producers to make food.



VI. Give reasons:

a) A food chain is formed between animals belonging to the same ecosystem.

Ans. The energy and nutrients transferred to one organism to another and the series forms is basically a food chain that develops into a food web. The animals in a particular ecosystem form these chains because; they are interconnected to each other and adapted to the same environment through biotic and abiotic factors.

b) Every ecosystem contains many food chains.

Ans. Because, every individual is dependent on another and every single organisms is feeding on more than one organism therefore in every ecosystem there are many food chains.

c) If all plants die, the animals will also die.

Ans. Because, plants are the food for many animals and those animals subsequently are the food for many other animals. Hence, when all plants die, the animals will also die because of shortage of food.

VII. Define:

- a) **Ecosystem:** Collection of living and non-living things which interact with each other is called an ecosystem.
- b) **Food chain:** A food chain shows how each organism in the ecosystem gets its food. These are the chains that basically represent “**who eats what**”.
- c) **Biodiverse:** A good ecosystem is bio-diverse. It means that a good ecosystem has a large variety of organisms living at each level, within it.
- d) **Producer:** Plants produce food they are called producers.
- e) **Consumer:** Animals that consume food are called consumers. Consumers can be of the following types: Primary, secondary and tertiary.
- f) **Decomposers:** They break them down dead remains of plants and animals into simpler components and return the important components back to the soil. These nutrients are then used again by the producers to make food.

Project Work

Make a booklet of any 5 animals and their eating habits.
Draw food chains related to those animals.

Unit 04: Health and Hygiene

SNC Learning Outcomes for Unit 04

All the students should be able to:

- Observe and recognise some common symptoms of illness (e.g. fever, coughing and influenza).
- Relate the transmission of common communicable diseases to human contact. (e.g. touching, sneezing, and coughing)
- Define health as a state of overall wellbeing.
- Describe the importance of maintaining good health.
- Recognise everyday behaviours that promote good health (e.g. a balanced diet, drinking clean water, exercising regularly, brushing teeth, getting enough sleep)
- Define balanced diet and explain its components.
- Explain the terms screen time and screen addiction.
- Compare the effects of screen time and exercise on the body.
- Explain how various factors namely diet, exercise, rest, personal hygiene and environmental hygiene contribute to the overall health of a person.
- Define microorganisms and germs.
- List important facts about germs.
- Explain some methods of preventing common diseases and their transmission (e.g. vaccination, washing hands, wearing mask).

Lesson 01: Flu Again!

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Observe and recognize some common symptoms of illness (e.g., fever, coughing and influenza).
- Relate the transmission of common communicable diseases (e.g., touching, sneezing, and coughing) to human contact.
- Discuss Islamic manners of sneezing.

Teacher's resource:

1. Class Attendance Register
2. Soft board display
3. Explore Your World – Science Book IV

Soft board Display: Image given

Islamic Integration:

When to instill it: at the beginning of the lesson _____

Instructional Stages:

Warm up Activity: Teacher will bring the attendance register and sort out the names of the students who were absent in last 5 days and will ask them the reason of their absence. Their illness will be linked to the introduction of the topic.

Narrated Abu Huraira: The Prophet ﷺ said,

"If one of you sneezes, he should say:

اَلْحَمْدُ لِلّٰهِ
"All Praise is for Allah"

and let those who hear it respond with:

يَرْحَمُكَ اللهُ
"May Allah have mercy on you"

and if answered so, greet with the greeting:

يَهْدِيْكُمْ اللهُ وَيُصْلِحْ بَالَكُمْ
"May Allah guide you and rectify your condition"
(Bukhari)

Direct Instructions: Teacher will discuss about:

1. Communicable diseases like flu
2. Islamic teachings on sneezing

Guided and Independent Practice – Activity time

1. Students will read the first page of the book and will be asked to do the activity given on that page. Students will discuss Islamic teachings related to sneezing in pairs.
2. Make a list of things to use when one has flu.

Class Work: Read the paragraph given in the book and draw the sequence of pictures to explain how flu spreads.

Homework Assignment: Gather at least 5 hadith on health and hygiene.



Vocabulary

illness

virus

cough

sneeze

Lesson 01: Health

Estimated Time Required: 40 minutes

Objectives: Students will In-Sha-Allah be able to:

- Define health as a state of overall wellbeing.
- Listing factors affecting the health.

Teacher's resource:

1. Soft board display
2. Explore Your World – Science Book IV

Soft board Display: Image given

Islamic Integration: Our Prophet S.W.W said “Cleanliness is half of faith.” (Sahih Muslim)

When to instill it: at the beginning of the lesson _____

Instructional Stages:

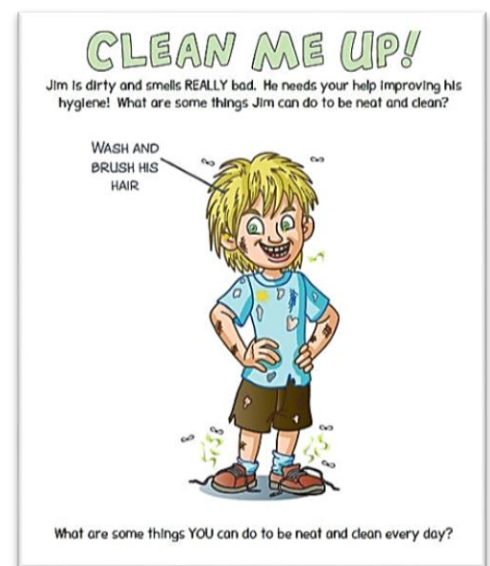
Warm up Activity: Can you help the child clean? List down 5 things he can do.

Direct Instructions: Teacher will discuss about and health in general and factors affecting health.

Guided and Independent Practice – Activity time:

Teacher will hand over the given sheet to students to provide their answers.

Class Work: Do Q1 and Q2 of STOP AND ASK YOURSELF on book page number 33 in notebook.



Vocabulary

irritated

energetic

disease

health

Home Assignment: Do Q3 of STOP AND ASK YOURSELF on book page number 02 in your notebook. Write 5 points on importance of maintaining good health on a colored A-4 size paper. Five best pieces will be displayed on soft board.

Suggested Video: <https://www.youtube.com/watch?v=dhpCdqOtuj0>



STOP AND ASK YOURSELF

Q 1: What is health?

Ans: Health is a state of complete physical and mental well being, not just the absence of an illness or disease. This means that a person is healthy if both his body and mind are in a sound state.

Q 2: Name the various factors that affect the health of a person.

Ans: There are various factors that contribute towards our health. Some of them are: exercise, diet, personal hygiene, rest and environmental hygiene

Q 3: How do flu germs spread from one person to another?

Ans: Most experts believe that flu viruses spread mainly when people with flu cough, sneeze or talk and tiny droplets of mucus fly out of the mouth or nose. These droplets can land on different surfaces including the hands or noses of people who are nearby. A person might get flu by touching a surface or object that has the flu virus on it and then touching their own mouth, eyes or possibly their nose.

Lesson 02: Eat Well, Sleep Well, Be Active Diet

Estimated Tim Required: 40 minutes

Objectives: Students will insha'Allah be able to:

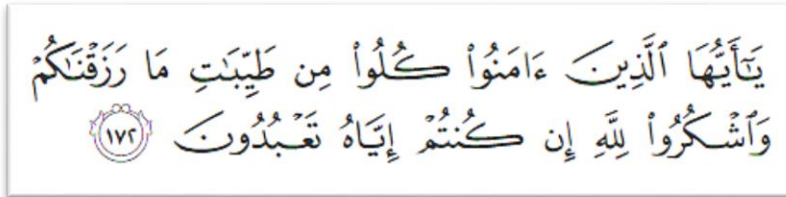
- Understand importance of proper and balanced diet.
- Define malnutrition.

Teacher's Resource:

4. Bananas or any other seasonal fruit
5. Soft board display
6. Explore Your World – Science Book IV

Soft board Display: Image given

Islamic Integration:



O believers! Eat from the good things We have provided for you. And give thanks to Allah if you 'truly' worship Him 'alone'.
[Al Baqarah: 172]

O humanity! Eat from what is lawful and good on the earth and do not follow Satan's footsteps. He is truly your sworn enemy. [Al Baqarah: 168]

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Teacher and students will share their fruits with each other. Teacher will make sure every child eats some fruit.

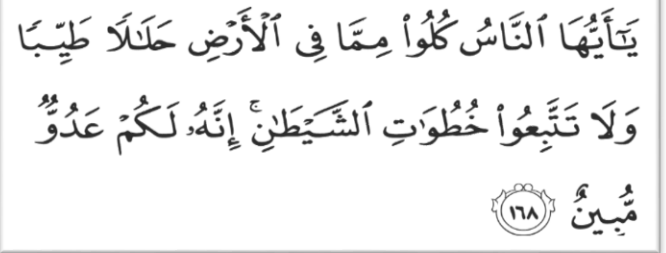
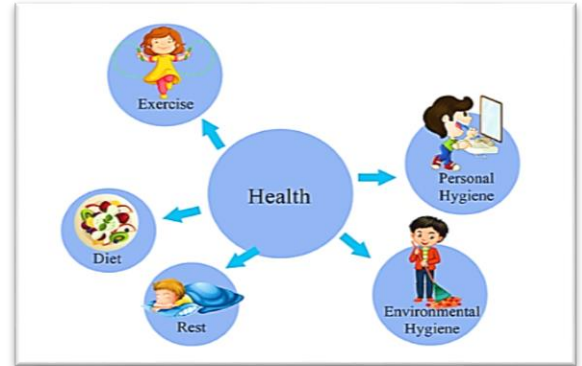
Direct Instructions: Teacher will discuss about Diet and Importance of balanced diet and malnutrition.

Guided and Independent Practice – Activity time

Students will work on the given sheets to check their understanding.

Eat Well Plate

Students will prepare Eat Well Plate with papers. 6 groups will be made including all students. Two groups will work on healthy breakfast, two will work on healthy lunch and two will work on healthy dinner.



Vocabulary

vital

diet

malnutrition

fatigue

1. Physical activity v/s Screen time
2. Screen Addiction - Effects of excessive screen time on kids' behavior and learning progress will also be discussed.

Guided and Independent Practice – Activity time

1. Teacher will divide the class into two groups and the board will be divided in two halves:

Group A will find answer to the following question:

What activities are fun, other than screen. Suggest any 5 for your classmates.

Group B will find answer to the following question:

Make screen time rules that can be followed.

Students answers will be compared.

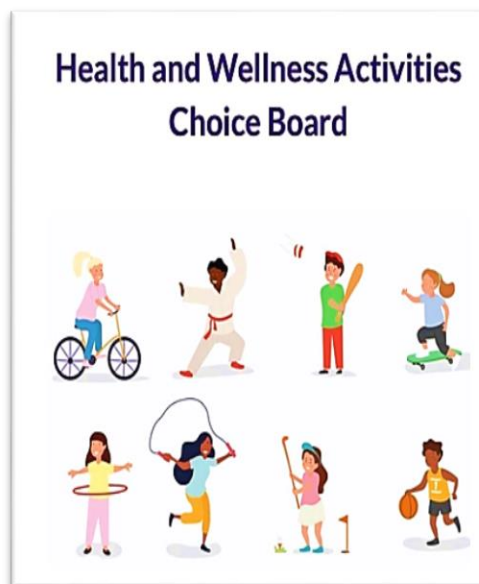
2. A voiceover power point presentation will be shown in order to explain the topic in detail. This will compare physical activity and screen time.
3. Students will be given 15 minutes' time to prepare a role play on screen addiction and screen time to present it in next class.

Class Work: Do Q2 of STOP AND ASK YOURSELF from page 36 in notebooks.

Home Assignment:

1. Do Q3 and Q4 of STOP AND ASK YOURSELF on book page number 36 in your notebook.
2. Compare the effects of screen time and exercise on the body through T-Chart.

Suggested Video: Importance of exercise: <https://www.youtube.com/watch?v=KrIPt0fi9vk>



Lesson 02: Eat Well, Sleep Well, Be Active Rest

Estimated Tim Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Know the significance of rest and proper sleep and how they contribute to overall health.

Teacher's Resource:

- Soft board display
- Explore Your World – Science Book IV

Soft board Display: Images given

Islamic Integration:

Sara was reading about the manners of sleeping according to the sunnah of Prophet Muhammad (ﷺ). She read that:

1. We must recite dua before sleeping.
2. We must sleep on our right side.
3. We must not sleep on our stomach.
4. We must shake the bedsheet and spread it neatly before sleeping.



وَمِنْ آيَاتِهِ مَنَامُكُمْ بِاللَّيْلِ وَالنَّهَارِ وَابْتِغَاؤُكُمْ مِنْ فَضْلِهِ
إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّقَوْمٍ يَسْمَعُونَ ﴿٢٣﴾

And one of His signs is your sleep by night and by day 'for rest' as well as your seeking His bounty 'in both'. Surely in this are signs for people who listen. [Ar- Rum: 23]

When to instill it: at the beginning of the lesson _____

Instructional Stages:

Warmup Activity: Role plays on screen addiction and screen time will be presented.

After that, probing questions:

- ◆ At what time you sleep?
- ◆ At what time you wake up?

Direct Instructions: Teacher will discuss about:

1. Rest - Proper sleep and its importance can't be ignored this will be taught to students.
2. Proper Sleep and the concept of sleep deprivation.

Guided and Independent Practice – Activity time

Students will together compile a list of good sleep habits. Teacher will write them all on the board.

Written work:

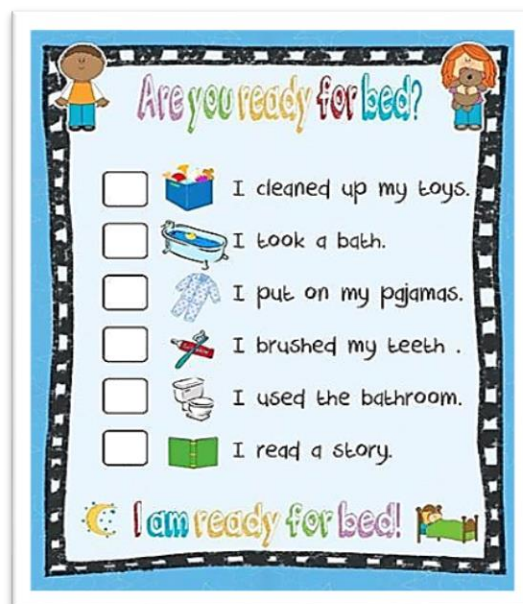
Do Q5, Q6 and Q7 of STOP AND ASK YOURSELF on book page number 36 in your notebook.

Home Assignment:

Do Exercise Q VII in book and VIII in your notebook.

Suggested video: Sleep and wake cycle:

<https://www.youtube.com/watch?v=CoCL0IB4u4g>



Vocabulary

exhausted

sleeping habit

memory

recommend

STOP AND ASK YOURSELF

Q 1: what is the importance of breakfast?

Ans: When we get up in the morning our body needs energy in the form of food. Breakfast refuels our body. If we start our day without breakfast, we feel tired and fatigued throughout the day.

Q 2: What is screen addiction?

Ans: **Screen addiction** is a condition when someone develops an uncontrolled habit of using screens and spends too much time on them. Watching TV till late at night or playing too many games on mobiles is a sign of screen addiction. Screen addiction is very harmful for our health.

Q 3: How long should we exercise every day to stay fit?

Ans: To stay fit and healthy we should exercise at least 30 minutes every day.

Q 4: What happens inside our body when we exercise?

Ans: When we exercise, our body gets more oxygen. Exercise keeps our body fit and prevents us from getting obese. People who do physical jobs are healthier than people who do jobs that require them to sit at the desk all day.

Ans. 5: Our body performs following things when we are asleep:

- Body growth and repair
- Maintenance of memory
- Removal of toxic material

Q 6: How many hours of daily sleep are recommended?

Ans: Doctors recommend getting at least 6-8 hours of sleep every night.

Q 7: What Islamic etiquette should be observed before sleeping?

Ans: According to the sunnah of Prophet Muhammad (ﷺ).

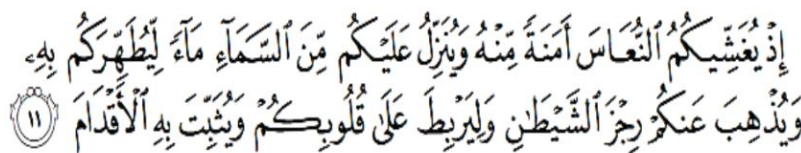
1. We must recite dua before sleeping.
2. We must sleep on our right side.
3. We must not sleep on our stomach.
4. We must shake the bed sheet and spread it neatly before sleeping.

Lesson 03: Personal and Environmental Hygiene Personal Hygiene

Estimated Tim Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define hygiene
- Classify hygiene as personal and environmental
- Describe and discuss personal hygiene in detail.



Teacher's Resource:

1. Soft board display
2. Explore Your World – Science Book IV

Soft board Display: Images given

Islamic Integration: Muslims have also been told to trim their nails regularly. Holy Prophet ﷺ in one of his Ahadith said that trimming nails is one of the natural ways to keep clean.

'Remember' when He caused drowsiness to overcome you, giving you serenity. And He sent down rain from the sky to purify you, free you from Satan's whispers, strengthen your hearts, and make 'your' steps firm.

[Surah Al Anfal: 11]

When to instil it: at the beginning of the lesson

Instructional Stages:

Vocabulary

germs

microscope

virus

bacteria

fungi

protozoa

maintainance

sterilization

cleanliness

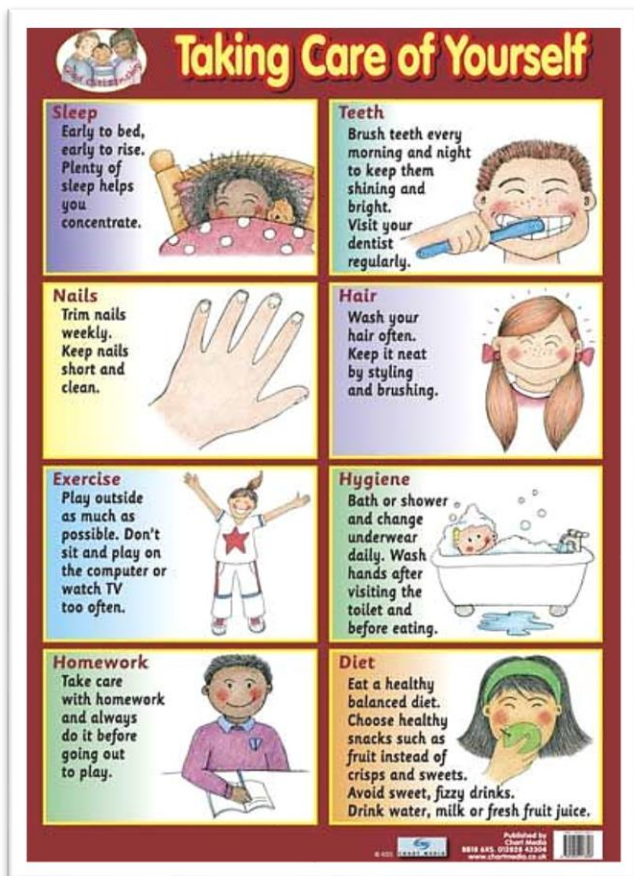
Warmup Activity: Teacher will check students nails either they are trimmed or not and introduce the topic by telling it's a part of personal hygiene.

Direct Instructions: Teacher will discuss about:

1. Hygiene
2. Personal and Environmental hygiene

Personal Hygiene: students will be taught personal hygiene flow chart through soft board material.

- Germs and its types
- Steps of Hand wash



Guided and Independent Practice – Activity time

Students will come one by one and act the steps of hand wash as shown in the book, to understand it in a better way.

Class Work: Do Q1 and 2 of STOP AND ASK YOURSELF on book page number 40 in your notebook.

Home Assignment: Do Exercise Q VI your book.

Suggested video: <https://www.youtube.com/watch?v=m8hws31ImUA>



Lesson 03: Personal and Environmental Hygiene

Estimated Tim Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define environment and environmental hygiene.
- Know and apply washroom etiquettes
- Dispose the garbage and litter properly.
- Research on Islamic teachings related to health and hygiene.

Teacher's Resource:

1. Soft board display
2. Explore Your World – Science Book IV

Soft board Display: Images given

Islamic Integration: “ALLAH loves those who keep themselves pure and clean.” [Surah Baqarah]

أَلَمْ تَرَوْا أَنَّ اللَّهَ سَخَّرَ لَكُمْ مَّا فِي السَّمَوَاتِ وَمَا فِي الْأَرْضِ وَأَسْبَغَ عَلَيْكُمْ نِعَمَهُ ظَاهِرَةً وَبَاطِنَةً
وَمِنَ النَّاسِ مَن يُجَادِلُ فِي اللَّهِ بِغَيْرِ عِلْمٍ وَلَا هُدًى وَلَا كِتَابٍ مُّنِيرٍ ﴿٢٠﴾

Have you not seen that Allah has subjected for you whatever is in the heavens and whatever is on the earth, and has lavished His favours upon you, both seen and unseen? 'Still' there are some who dispute about Allah without knowledge, or guidance, or an enlightening scripture. [Luqman: 19]

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Clean your class and pick up all the litter and dispose it in dustbin.

Direct Instructions: Teacher will discuss about:

1. Environmental Hygiene
2. Washroom Ethics
3. Proper Disposal of Garbage
4. Islamic teachings on health and hygiene

Guided and Independent Practice:

1. Teacher will engage students in cleaning their surrounding starting with their class and corridors. They will be told the importance of disposing the litter properly in a closed dustbin. (Integration with the art class can also be done in order to make their own closed and covered table dustbins in pairs to throw their wrappers of lunch or the litter of sharpening the pencils)
2. Small posters related to washroom etiquettes can be prepared and pasted outside the washrooms in order to create hygiene awareness.
3. Teacher will ask students to research on Islamic teachings on health and hygiene and will be asked to present in assembly presentation.

Class Work:

1. Do Q3, Q4 and Q5 STOP AND ASK YOURSELF on book page number 40 in your notebook.
2. Do Exercise II and III in your book.

Vocabulary

environment

disinfectant

garbage

polythene

hygiene

unclean

substance

trim nails

purity

Home Assignment:

1. Do Q6 of “*Stop and Ask Yourself*” on book page number 40 in your notebook.
2. Do Exercise Q I, IV and V in your note book.



Suggested video: https://www.youtube.com/watch?v=X2YgM1Zw4_E

STOP AND ASK YOURSELF

Q 1: Define hygiene.

Ans: Hygiene is the science that deals with the maintenance of health by reducing contact with germs through cleanliness and sterilization.

Q 2: What are the important areas of personal hygiene.

Ans: Some important areas of personal hygiene are our nails, teeth, hands, feet and our home.

Q 3: What are some important challenges for environmental hygiene?

Ans: Major challenges include poor water quality, inadequate sanitation and waste management, air pollution, and the impact of climate change on these systems.

Q 4: What are germs? Where do they grow?

Ans: Germs are tiny organisms that cause diseases. They can only be seen under a microscope.
Open garbage dumps in cities are also the breeding sites for germs of all kinds.

Q 5: Name the four types of germs.

Ans: The four types of germs are:

1. Virus
2. Bacteria
3. Fungi
4. Protozoa

Q 6: Why does garbage give off a bad smell?

Ans: The moisture and dirt in the garbage attracts germs to invade it. The germs feed upon the garbage. The chemicals produced as a result have a bad odour. That is why garbage stinks.

EXERCISE

I. Identify the healthier choice in each of the following cases? Give reasons for your answer.

1. Omer is free for the next three hours. Should he watch television or read a book?

Ans. He should read a book in order to increase his vocabulary, to enhance his knowledge and to learn something new and helpful.

2. Fatima is planning the menu for the upcoming family dinner. She has to choose between French fries and a salad. What should she choose?

Ans. She should choose salad as it is one of the healthier option to eat. French fries are oily and one of the fried item which is harmful for our body parts such as heart and liver and also the reason of obesity on the other hand salad helps to maintain weight and keep our stomach healthy.

3. Sara's mother just changed her baby brother's diaper in the car. Where should she throw it?

Ans. She should throw it in a shopper and keep it with her until and unless she finds a dustbin.

4. Amir just saw that the garbage can has been left open. What should he do?

Ans. He should cover it properly to avoid germs to spread in the air and to keep the environment free from stink of garbage.

5. **Saad has a test tomorrow. It is 9 O'clock at night and he still has to study. Should he stay up at night or should he sleep till 5 O' clock in the morning and do the rest of his work after he gets up.**

Ans. He should sleep early and then get up early in the morning to study with a fresh mind. At night he will be exhausted and will not be able to study more with a tired mind.

II. Sara is trying to write some facts about germs in her notebook. Can you help her?

1. Germs are too small to be seen with the naked eye.
2. These are tiny organisms that cause diseases.
3. There are four types of germs: virus, bacteria, fungi, protozoa.
4. They breed themselves on open garbage.
5. They spread because of poor hygiene and cause health issues.

III. What is personal hygiene? Which of these practices are against the rules of personal hygiene?

1. Keeping long nails
2. Using the washroom barefoot
3. Biting nails
4. Walking barefoot in your car porch
5. Not washing hands properly after using the toilet
6. Brushing your teeth on weekends only
7. Checking the hair weekly for head lice
8. Flushing down the toilet bowl after using it

Ans. Personal Hygiene is to keep yourself neat and clean. Your nails, hair and your body should be clean and pure.

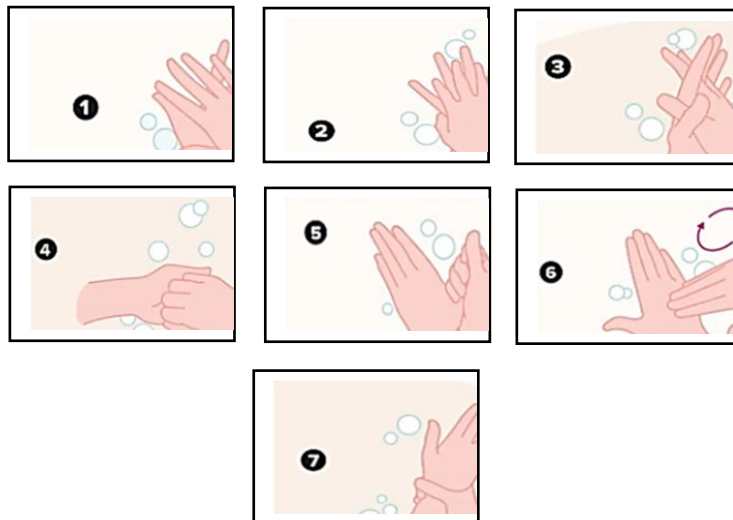
The practices that are against the rules of personal hygiene are:

1. Not flushing down the toilet bowl after using it
2. Using the washroom barefoot
3. Walking barefoot in your car porch

IV. What is hand hygiene? Write down the various rules for maintaining proper hand hygiene.

Ans. Hand hygiene is to keep our hands clean and free of germs.

Rules for proper hand hygiene are:



V. Define the following

1. Screen time

The total time that is spent on activities that make you look at a screen is called the **screen time**. The screen time should not be more than an hour a day to prevent these harmful effects.

2. Screen addiction

Screen addiction is a condition when someone develops an uncontrolled habit of using screens and spends too much time on them.

3. Hygiene

Hygiene is the science that deals with the maintenance of health by reducing contact with germs through cleanliness and sterilization

4. Malnutrition

Malnutrition is the condition that develops when the body does not get the right amount of vitamins, minerals, and other nutrients needed to maintain good health.






5. Environment

Everything around us is our **environment**. Thus, our environment includes our home and the places surrounding it.

6. Human growth hormone

Human growth hormone is a peptide hormone that stimulates growth, cell reproduction, and cell regeneration in humans and other animals.

VI. Trace each problem to its root cause. There may be more than one cause.

				
obesity	fatigue	tooth decay	flu	memory difficulties
<div> <div>sleep deprivation</div> <div>lack of exercise</div> <div>bad diet</div> <div>poor hygiene</div> </div>				

Ans. Obesity is due to lack of exercise.

Fatigue is due to sleep deprivation and bad diet.

Tooth decay is due to bad diet and poor hygiene.

Flu is due to poor hygiene.

Memory difficulties are due to sleep deprivation and bad diet.

VII. Fill in the blanks

1. Health is a state of complete **physical** and **mental** well-being.
2. It is important to take at least **08** hours of sleep at night.
3. Dirty places can cause **germs** to grow.
4. A condition in which a person develops an uncontrolled habit of using screens is known as **screen addiction**.
5. We should exercise for at least **30** minutes daily.

VIII. Do you consider the following two persons healthy?

- **Ayesha remains sleepy in class. She is not able to focus on the lesson.**

Ans. No this state of Ayesha is not of a healthy person. Due to sleep deprivation she is sleepy and can't concentrate.

- **Ahmed is very lean and thin but he is very active and plays a number of outdoor games. He also performs very well in class.**

Ans. Yes Ahmed is healthy and active, as he is indulging in physical activities a lot. It makes him active, energetic and stress free.

Unit 05: Matter and its Characteristics

SNC Learning Outcomes for Unit 05

All the students should be able to:

- Describe matter and its states (solid, liquid, gas).
- Describe characteristics of each state of matter with examples.
- Compare and sort objects and materials on the basis of physical properties (e.g. mass, volume, states of matter, ability to conduct heat or electricity, ability to float or sink in water).
- Explore the properties of metals (i.e. appearance, texture, color, density).
- Identify properties of metal (conducting heat and electricity) and relate these properties to use of metals (i.e. a copper electrical wire, an iron cooking pot).

Lesson 01: What is Matter? What is non-matter Three Forms of Matter

Estimated Tie Required: 2 periods of 40 minutes

Objectives: Students will In-Sha-Allah be able to:

- Experiment and explore what are matters?
- Know what are non-matters?

Teacher's resource:

1. An empty jar
2. A weighing scale
3. Some water in a glass
4. An inflatable toy or a balloon
5. An air pump
6. Soft board display
7. Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: This is the beauty in Islam that Almighty Allah had created every single thing very beautifully and logically. We can find logical signs in our existence and can relate it with today's science.

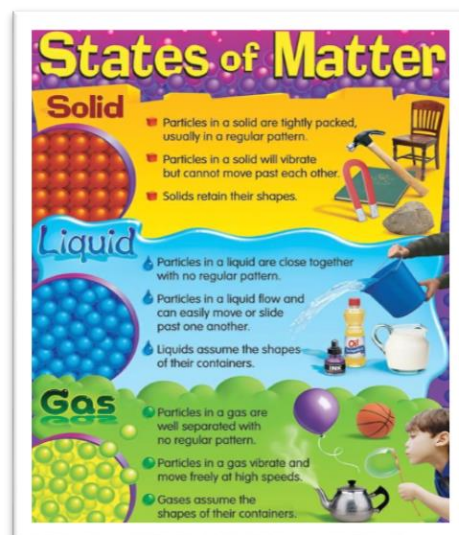
When to instill it: at the beginning of the lesson_____

Instructional Stages:

Warmup Activity:

Matter Hunt: In this activity, teacher can hide some items in the classroom or corridor etc and students find and categorize them as solid, liquid, or gas.

Direct Instructions: Teacher will discuss about the Concept of Matter and Non-Matter. After students are aware of matter, teacher will relate it



with non-matter for instance, light and sound are non-matter because we cannot touch them, feel them or they cannot take some space.

Guided and Independent Practice:

Students will do three experiments in teacher's supervision, as instructed in the book.

Class Work: Students will be asked to write the following answers:

1. Define matter
2. What is non-matter? Write some examples.

Homework Assignment: Read page number 46 and 47 of the book containing information on states of matter.

Suggested Video: Matter <https://www.youtube.com/watch?v=QQsybALJoew>



Vocabulary

matter

occupy

space

inflatable

weighing scale

air pump

mass

non-matter

molecules

Lesson 01: Three States of Matter

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define and distinguish between the three states of matter (solid, liquid and gas).
- Discover all three states of matter with water.

Teacher's Resource:

- Printable cards/ cut out images/ photos of different everyday use items
- Science lab (Ice cube, Beaker, Bunsen burner)
- Soft board Display
- Explore Your World - Science Book IV

Soft board Display: Image given



Islamic Integration: Have you thought how diversified Allah's creation is? How entirely different things are interlinked with each other and collaborating in a beautiful manner. This is what only Allah SWT can do no one else can do this.

When to instill it: at the beginning of the lesson_____

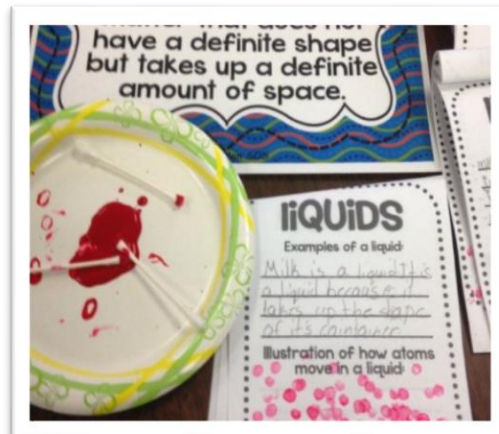
Islamic Integration: This is the beauty in Islam that Almighty ALLAH had created every single thing very beautifully and logically. We can find logical signs in our existence and can relate it with today's science.

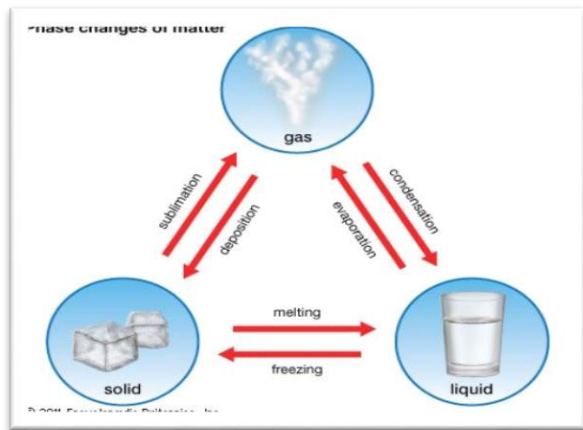
When to instill it: at the beginning of the lesson_____

Instructional Stages:

Warmup Activity: Teacher can bring printable cards, or cut pictures out of magazines. Then have kids sort them by states of matter. Teacher should ensure each student get one printable to sort.

Direct Instructions: Teacher will discuss:





- Three states of matter
- Water as an example of all the three states of matter
- Similarities and Differences between the three states of matter

Guided and Independent Practice:

Students will be taken to science lab to witness an experiment that'll show water as an example of all the three states of matter.

Start with ice cubes, melt them down to water then bring them to boiling to watch steam form.

Teacher can also integrate with the art teacher and will ask her to introduce cotton swab activity to draw the molecules of solid, liquid and gases.

Class Work: Do Q1 and Q2 of STOP AND ASK YOURSELF in the notebook.

Homework Assignment:

1. Do Q3 and Q4 of STOP AND ASK YOURSELF on book page number 47 in your notebook.
2. Do Exercise Q I in your book.

Suggested Video: Three states of matter <https://www.youtube.com/watch?v=8zrbvbxWgJk>



STOP AND ASK YOURSELF

Q 1: Which characteristics is common among solids, liquids and gases?

Ans: They all are types of matter that is they all have some mass and occupies some space.

Q 2: State one difference between solids, liquids and gases.

Ans: The arrangement of molecules in all three states of matter is different from each other. In solids they are closely packed with each other, in liquids they are far from each other and in gases they are farthest to each other.

Q 3: In which form of matter the molecules are farthest from each other?

Ans: In gases the molecules are farthest from each other.

Q 4: Classify the following as matter or non-matter:

Matter	Non-Matter
Rain drops	Shadow
Petrol	Ali's voice
Tear	
Breath	

Lesson 02: Physical Properties of Matter Colour and Texture

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

Understand physical properties of matter (color and texture)

Teacher's resource:

- Short quiz questions
- Basketful of materials (iron piece, cotton, aluminum foil etc.)
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration:

Bring me blocks of iron!" Then, when he had filled up 'the gap' between the two mountains, he ordered, "Blow!" When the iron became red hot, he said, "Bring me molten copper to pour over it."[Surah Al Hajj: 96]

Things on earth are different from each other similarly each human is different from other on the basis of color, caste and creed but this is the beauty of Islam only that do not create differences on the basis of such materialistic things. In Islam all are equal except on the basis of the level of their TAQWA.

When to instil it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: A short surprise quiz on the previous lesson.

Teacher will introduce the topic with the help of a basketful of materials in order to sort them according to color and texture.

Direct Instructions: Teacher will discuss about:
Physical properties - Color and Texture

Guided and Independent Practice:

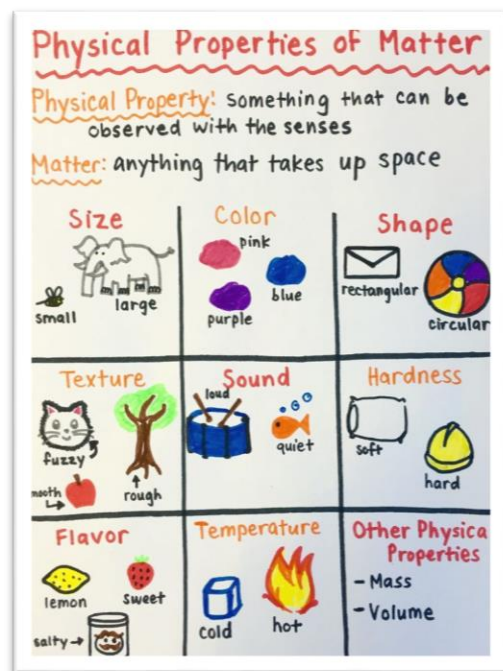
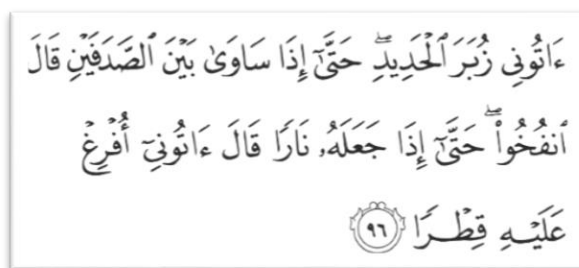
Students will prepare a table. Looking at the items teacher showed at the beginning of the class will try to list down properties of each item. They will partially fill it after this lesson and the rest will be completed in the next lesson. It should look something like this:

Thing	State	Property 1	Property 2	Property 3	Property 4
cotton	solid	soft	colourless		

Class Work: Do Q1 of STOP AND ASK YOURSELF on book in the notebook.

Home Assignment: Identify important pieces of info from the Unit to prepare for a quiz.

Suggested Video: https://www.youtube.com/watch?v=340MmuY_osY



Lesson 02: Physical Properties of Matter

Mass, Volume and Density

Floating and Sinking

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:
Understand physical properties of matter (mass, volume and density, floating and sinking).

Teacher's resource:

- Any three liquids
- Soft board Display
- Explore Your World - Science Book IV

Soft board Display: For soft board display refer to the picture given in book.

Vocabulary
property
texture
volume
density
balance
observe
size
compare

Islamic Integration: Allah SWT is the one who can do wonders. HE has created a

sea having two colored water. HE has created amazing things likewise HE has created something that floats and another thing that can sink.

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Teacher will show three bottles of liquids to students about the difference: honey, water, oil.

Direct Instructions: Teacher will discuss about:

- Mass, Volume and Density
- Concept Floating and Sinking related to density

A voiceover power point presentation will be shown in order to explain the topic in detail and their relationship will be explained with the help of activities given in ppt.

Teacher will ask students to find the link between these two topics that is density and sinking and floating.

Guided and Independent Practice – Activity time:

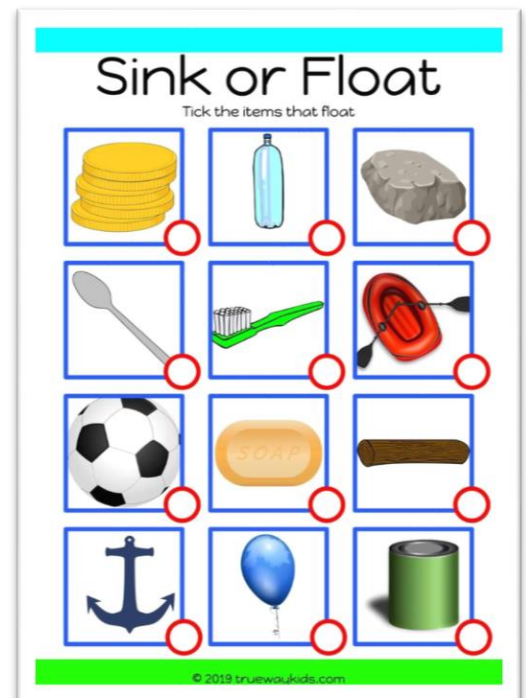
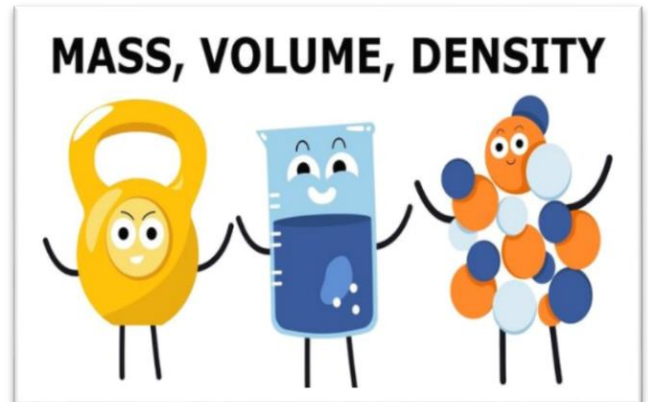
Students will watch a video. <https://www.youtube.com/watch?v=SYsfIJxCbQg>

Simple experiment: Different liquids have different density

https://youtube.com/shorts/kTMLgaONGHI?si=AJ7vyW_4hoSULx8F

Class Work: Do Q2 and Q3 of STOP AND ASK YOURSELF in the notebook.

Home Assignment: Do Exercise Q II, QIII and Q IV in book.



Lesson 02: Physical Properties of Matter

Metal | Physical Properties of Metal

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:
Understand physical properties of metal.

Teacher's Resource:

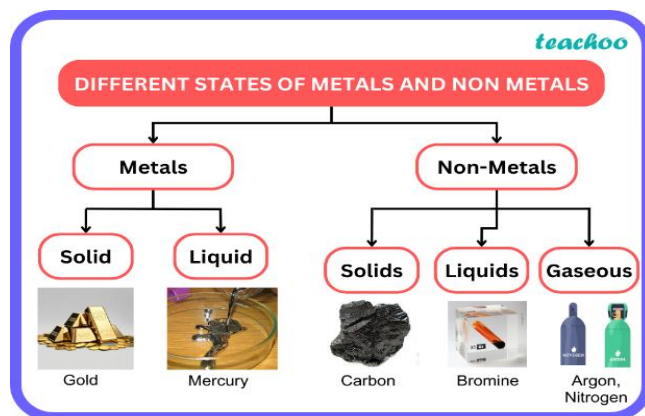
- Soft board Display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: ALLAH S.W.T is the one who can do wonders. HE has created a sea having two colored water. HE has created amazing things likewise HE has created something that floats and another thing that can sink.

And We sent down iron with its great might, benefits for humanity, ... [Surah Al Hadeed: 25]

When to instill it: at the beginning of the lesson



وَأَنْزَلْنَا الْحَدِيدَ فِيهِ بَأْسٌ شَدِيدٌ وَمَنْفَعٌ لِلنَّاسِ



Warmup Activity: Look at the pictures given in the book and identify things made of metal and non-metal.

Direct Instructions:

Physical Properties of metal:

- Shine and Luster
- Texture
- Conduction of heat and electricity

Guided and Independent Practice:

Students will watch a video <https://www.youtube.com/watch?v=BowQcGw9IYk> as reinforcement.

Class Work:

Do Q4 of “*Stop and Ask Yourself*” on book page number 50 in your notebook.

Do Exercise Q V in your notebook.

Home Assignment: Do Exercise Q VI and QVII in book.



Vocabulary

luster

texture

cast

mold

foil

conduction

STOP AND ASK YOURSELF

Q 1: Give two examples of hard and soft solids.

Ans: Examples of hard solids: Table, Chair

Examples of soft solids: Cotton, Aluminum foil

Q 2: Define density.

Ans: Density of a substance is the mass present in a definite volume.

Q 3: Why do certain things float on water?

Ans: Because of their low density they float on the surface of water.

Q 4: What makes metals special among solids?

Metals are special solids which have special properties like:

- Most of the metals have a shine or luster.
- Some metals are really hard in texture like iron.
- Some of the metals are relatively soft like; copper, zinc and aluminum.
- Metals can conduct heat and electricity.

EXERCISE

I. Write down the different states of matter present in the following.

Ans. From left to right:

Liquid, Gas, Gas, Solid

II. True or false.

- | | |
|---|-----|
| a. All living things and non-living are made of matter. | (T) |
| b. All solids can float in water. | (F) |
| c. Molecules in liquid are closer to each other than in solid. | (F) |
| d. Density of substance is the same as its mass. | (F) |
| e. Liquids can fit in a container of any shape while solids cannot. | (T) |

III. If you are having a picnic at a beach, which of the above things will float on water when thrown in it.

Ans. Slippers and Sea shell

IV. Arrange the following things according to their density.

Ans. Pencil, Plastic ruler, eraser, steel ruler, crayons, ink pot (**Ascending order**)

V. Give reasons:

a. Cooking pans have handles made of plastic?

Ans. Because, to prevent us from burning our hands.

b. An inflated balloons lose its shape.

Ans. Because the space is taken and filled with a gas.

c. The swimmer floats help the children to swim.

Ans. They are used to aid children with buoyancy, or for floating on for fun. The most common are inflatable ring.

d. It is recommended to use rubber gloves while working with electricity.

Ans. Because they prevent us from any kind of shock. Plastic is an insulator it cannot conduct electricity.

e. Jewelry was always made from gold and silver.

Ans. Because they are valuable metals. They have shine and luster.

VI. Which of the following has more mass?

a) A bucket full of water or a glass full of water	Bucket
b) A wooden table or a wooden spoon	Wooden table
c) A banana or a watermelon	Watermelon
d) 2 kg of rice or 1 kg of rice	2 Kg rice
e) A 100g bag of chips or a 25g bag of chips	100g bag of chips
f) An ant or a grasshopper	Grasshopper

VII. Which of the following occupies greater space?

- | | |
|--|--------------|
| a) 1 kg of rice or 2 kg of rice | (2 kg rice) |
| b) 6 litres of petrol or 1 litre of petrol | (6 litres) |
| c) A banana or a watermelon | (Watermelon) |
| d) An elephant or a mouse | (Elephant) |

Unit 06: Forms of Energy and Energy Transfer

SNC Learning Outcomes for Unit 06

All the students should be able to:

- Identify sources of energy (e.g. the sun, flowing water, wind, coal, oil, gas).
 - Recognise that energy is needed to do work, (e.g. for moving objects, heating and lighting)
 - Describe and demonstrate the transformation of energy.
 - Understand the importance of energy conservation.
 - Recognise the role and responsibility of humans to conserve energy resources.
- Relate familiar physical phenomena (i.e. shadows, reflections and rainbows) to the behaviour of light.
 - Relate familiar physical phenomena (i.e. vibrating objects, echoes) to the production and behaviour of sound.
- Recognise that warmer objects have a higher temperature than cooler objects.
 - Investigate the changes that occur when a hot object is brought in contact with a cold object.
 - Identify ways to measure temperature and understand its unit.
- Describe and demonstrate that electrical energy in a circuit can be transformed into other forms of energy (e.g. heat, light, sound).
 - Explain and provide reason that a simple electric circuit requires a complete electrical pathway.
- Construct a simple electric circuit by using wire, bulb and some common things/common source of energy.

Lesson 01: Energy Transformation or Conversion of Energy

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Know what is energy?
- Observe and understand the conversion (transformation) of energy.

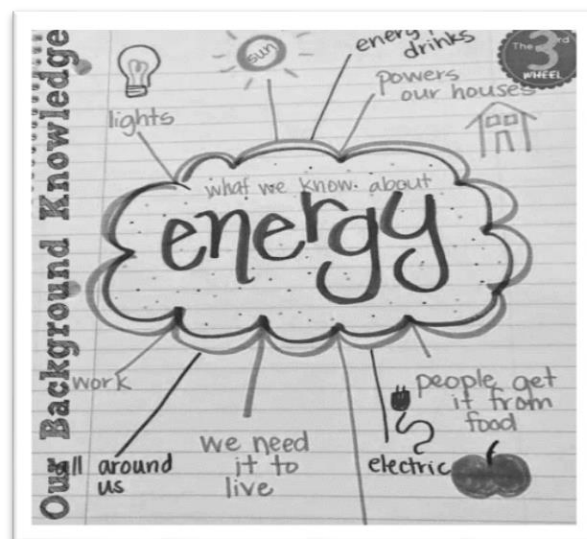
Teacher's Resource:

1. Different colored markers
2. Soft board display
3. Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Greatness of ALLAH (S.W.T.) is really very vast. We as humans cannot imagine it. HE has created different kinds of energies that benefit us in different ways.

When to instill it: at the beginning of the lesson



Indeed, in the creation of the heavens and the earth; the alternation of the day and the night; the ships that sail the sea for the benefit of humanity; the rain sent down by Allah from the skies, reviving the earth after its death; the scattering of all kinds of creatures throughout; the shifting of the winds; and the clouds drifting between the heavens and the earth—"in all of this" are surely signs for people of understanding.

[Al Baqarah: 164]













إِنَّ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ وَالْفُلِ الَّتِي تَجْرِي فِي الْبَحْرِ بِمَا يَنْفَعُ النَّاسَ وَمَا أَنْزَلَ اللَّهُ مِنَ السَّمَاءِ مِنْ مَّاءٍ فَأَخْيَا بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِنْ كُلِّ دَابَّةٍ وَتَصْرِيفِ الرِّيْحِ وَالسَّحَابِ الْمُسَخَّرِ بَيْنَ السَّمَاءِ وَالْأَرْضِ لَآيَاتٍ لِقَوْمٍ يَعْقِلُونَ ﴿١٦٤﴾

Vocabulary
energy
ability
atmosphere
primary
power
electricity
conversion
transformation
occur
convert
warmth
chemical energy
energy transfer

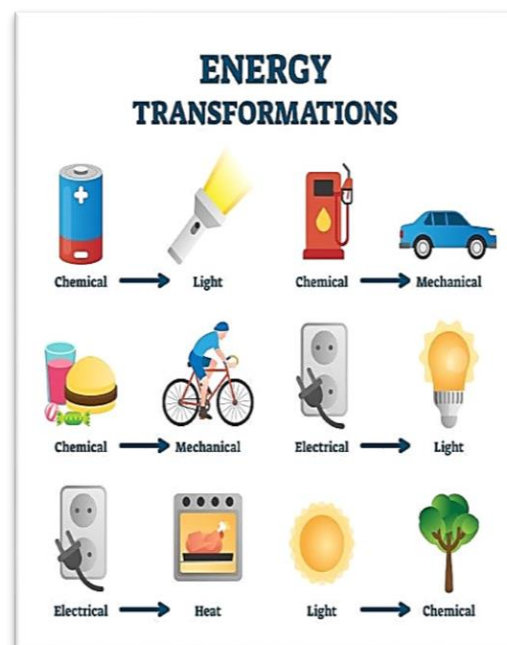
Name: _____

Where Does the Energy Come From?

battery sun electricity fuel man

			
_____	_____	_____	_____
			
_____	_____	_____	_____
			
_____	_____	_____	_____

WWW.ANOFFORELIFE.COM



Instructional Stages:

Warm up Activity: Teacher will ask students what comes to their mind when they hear the word 'energy' and will create a web on the board.

Direct Instructions: Teacher will discuss about:

- basic concept of energy
- conversion of energy

Guided and Independent Practice – Activity time:

Teacher will divide the class into 4-6 groups and each group will complete one simple experiment. They will discuss and will share their points with teacher.

Students will make a small table in their note books and will discuss with peers the following before noting down:

Experiment	Energy type	Converted to	Our observation
rubbing palms			
burning of wood			

turning on the fan			

Magnet and Paper Clips Materials: Magnet, paper clips Procedure: Move a magnet under a tablecloth and see how it affects paper clips on top. This shows how magnetic energy is converted into kinetic energy.	Rubber Band Energy Materials: Rubber bands, paper clips Procedure: Stretch a rubber band and then release it to see how it snaps back. You can use a paper clip to see how far it flies, showing the conversion of stored elastic potential energy to kinetic energy.
Bouncing Ball Experiment Materials: Bouncy ball, ruler Procedure: Drop the bouncy ball from a height and measure how high it bounces back. This demonstrates the conversion of gravitational potential energy to kinetic energy and back.	Blowing Up a Balloon Materials: Balloon, baking soda, vinegar. Procedure: Combine baking soda and vinegar in a bottle, then stretch the balloon over the bottle's opening. The chemical reaction produces gas that inflates the balloon, showing conversion of chemical energy to mechanical energy.
Paper Airplane Flight Materials: Paper Procedure: Fold different types of paper airplanes and test how far they fly. This shows the conversion of potential energy (when the plane is held in hand) to kinetic energy (as it flies).	Sound Energy with a Rubber Band Materials: Rubber band, small container Procedure: Stretch a rubber band across the container and pluck it. The vibration creates sound waves, showing the conversion of mechanical energy into sound energy.

Class Work: Do Q1 and Q4 STOP AND ASK YOURSELF on book page number 56 in your notebook.

Homework Assignment: Do Exercise I (in book) and II (in notebook).

Suggested Video: <https://www.youtube.com/watch?v=Q0LBegPWzrg>



Lesson 01: Conservation of Energy Renewable and Non-Renewable Forms of Energy

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

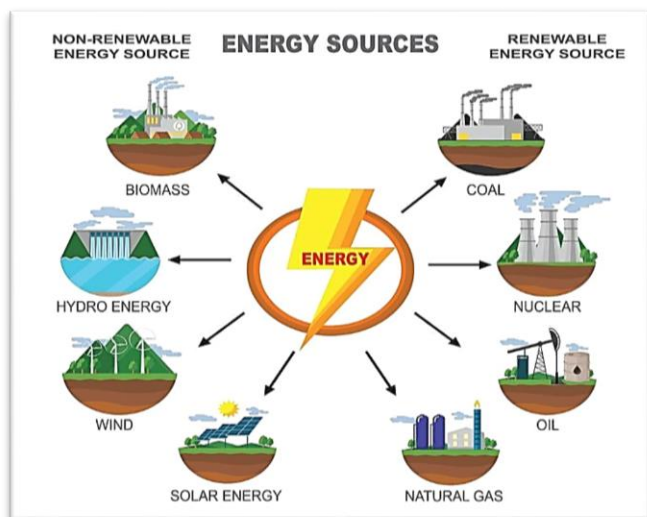
- Categorize the forms of energy into renewable and non-renewable sources.

Teacher's Resource:

- Chocolate chip cookies (one for each student)
- Soft board display
- Explore Your World - Science Book IV

وَجَعَلْنَا سِرَاجًا وَهَّاجًا ۝١٣

وَبَيَّنَّا فَوْقَكُمُ سَبْعًا شِدَادًا ۝١٢



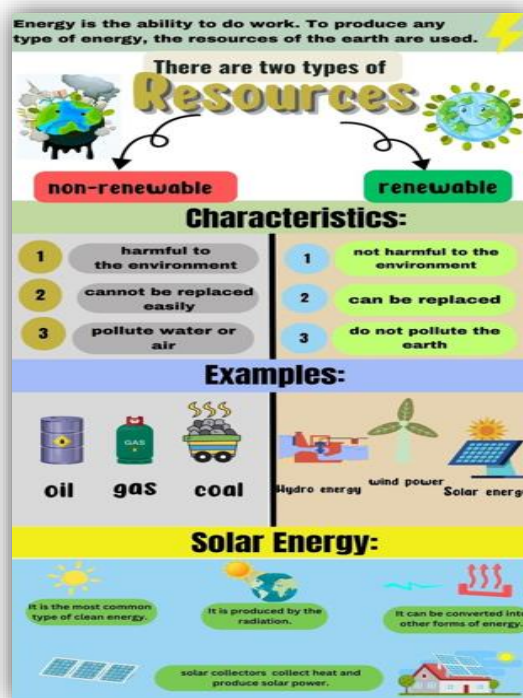
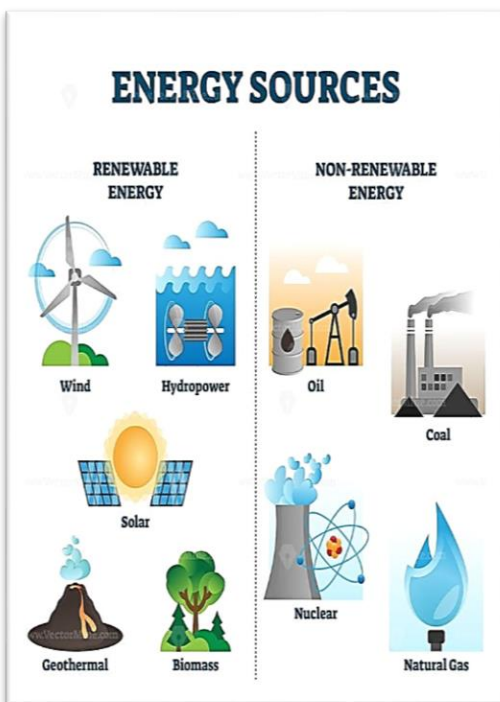
Soft board Display: Images given

Islamic Integration: Like everything else, energy **is** part of Allah's creation. The Qur'an encourages people to look intensely at Allah's creation and learn how to use it properly. The Sun is the most potent source of energy, heat and light, for the earth:

Did We not build seven strong [heavens] above you, and make a blazing lamp? (Qur'an 78:12)

When to instill it: at the beginning of the lesson

Vocabulary
renewable
non-renewable
unlimited
hydro
geothermal
resources
gasoline
used up
alternate resources



Instructional Stages:

Warmup Activity: Nonrenewable sources of energy

Renewable Resources	Non-renewable Resources
Depletion	
Renewable resources cannot be depleted over time.	Non-renewable resources deplete over time.
Sources	
Renewable resources include sunlight, water, wind and also geothermal sources such as hot springs and fumaroles.	Non-renewable resources includes fossil fuels such as coal and petroleum.
Environmental Impact	
Most renewable resources have low carbon emissions and low carbon footprint.	Non-renewable energy has a comparatively higher carbon footprint and carbon emissions.

Coal mining – Distribute one chocolate chip cookies among students.

The cookie is the coal mine and chocolate chips are coal pieces. Students are required to extract the coal using only the toothpicks. The goal is to remove as much coal as they can with as little damage as possible to the coal mine. Ask them to take 3 minutes.

Direct Instruction: Renewable and Non-Renewable sources of Energy

- Teacher will ask students if they know the literal meaning of renewable and non-renewable sources of energy.
- These terms will be explained by the teacher along with examples.

Guided and Independent Practice:

Teacher will provide students with a list of resources of energy and students will place them in renewable or nonrenewable column and will give reason why:

oil, coal, natural gas wind, solar, geothermal, hydropower, petroleum, nuclear energy, sun, water, heat, biomass, fossil fuels

Written task: Do Q2 and Q3 STOP AND ASK YOURSELF on book page number 56 in your notebook.

Home assignment: Make a booklet on any 3 renewables and 3 non-renewable resources of energy. This is a graded assignment.

You will be required to

- Define each resource
- Explain its working
- Where it is found
- Its advantages/ disadvantages
- Future prospects

Suggested Video: Renewable and non-renewable sources of energy:

https://www.youtube.com/watch?v=Giek094C_14



Lesson 01: Conservation of Energy

Importance of Conservation of Energy

Estimated Time Required: 40 minutes

Objectives: Students will insha' Allah be able to:

- List points to show importance of conservation of energy
- Know and understand the role of humans in conservation

Teacher's Resource:

- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Images given

Islamic Integration: Wastage of water is prohibited in Islam. We are advised to use bucket instead of the shower to avoid water wastage. We will be accountable for our deeds. (not relevant)

When to instill it: _____

Instructional Stages:

Warmup Activity: Do you see wastage of water somewhere? Can you write 5 ways to avoid the wastage of energy?

Direct Instructions:

- Teacher will start by asking students about their understanding of conservation of energy.
- Students first write 10 ways to avoid energy wastage in pair and will share their views with the whole class.

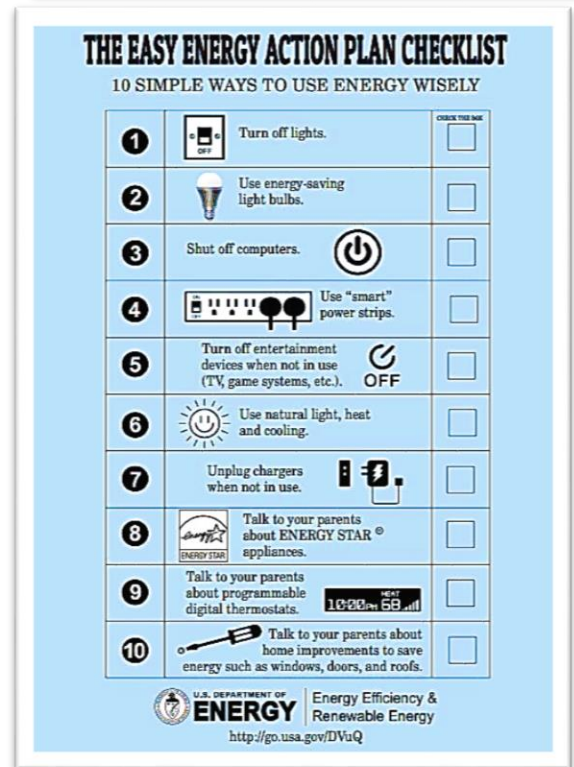
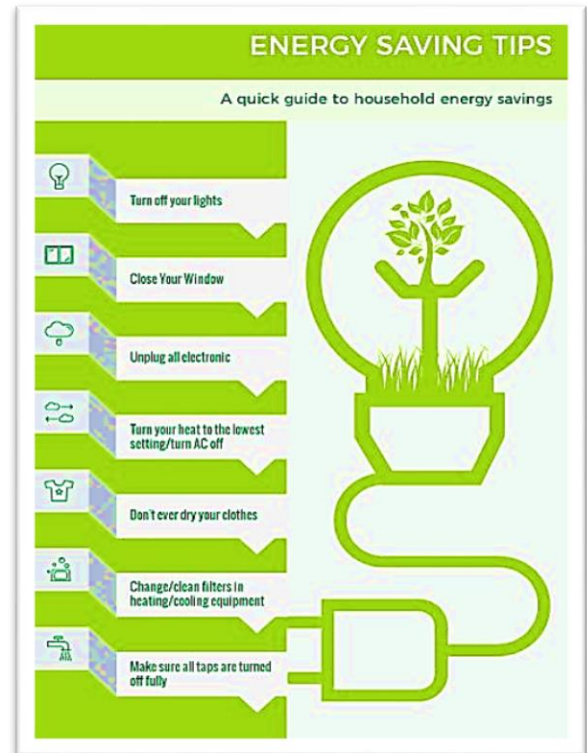
Guided and Independent Practice:

Awareness Campaign

- Students will prepare a campaign on **Energy Conservation** for junior classes.
- They will be asked to visit Class III and Class II, to talk about conservation of energy and its importance. They will spread the following information:
 - Close the tap properly.
 - Switch off the lights and fans of your class room when not in class.
 - Don't waste water.

Class Work: Do Q5 of STOP AND ASK YOURSELF on book page number 56 in your notebook.

Home Assignment:



Create a brochure that persuades people in your community to conserve energy. Teachers instruct students to create a brochure on a piece of paper.

http://www.education.com/activity/article/make_a_fun_brochure_fourth/

Suggested Video: Potential and Kinetic Energy <https://www.youtube.com/watch?v=t0ShHdtB8jA>



STOP AND ASK YOURSELF

Q 1: What is energy?

Ans: The ability to do work is called energy. Energy is needed to change the state of matter.

Q 2: Name three natural resources without which life is not possible.

Ans: The natural resources without which life is not possible are: Sunshine, Water and Wind.

Q 3: Name three natural resources which are non-renewable.

Ans: Petroleum, gasoline and coal are some examples of non-renewable energy.

Q 4: Give a few examples of energy conversion in everyday life.

Ans: The examples of energy conversion in everyday life are:

Rubbing the palms
Burning wood
Electric Fan
Electric Iron

Q 5: Why should we conserve energy in our personal life?

Ans: Conservation of non-renewable resources depends upon finding alternate resources. The best way is to gradually replace non-renewable resources of energy with renewable resources. The other way of conservation of energy is to save energy in our personal lives in every possible manner.

Lesson 02: Light and Sound in Everyday Life Light

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define light as a natural form of energy.
- Distinguish between transparent, translucent and opaque object.

Teacher's Resource:

- Light Energy Worksheet – one for each student (given at the end of Unit)
- A flash light, piece of dark fabric, book, aluminum foil, clear wrap
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Vocabulary

natural resource

transparent

translucent

opaque

absorb

reflect

Islamic Integration: Allah says in the Quran:

“It is He who made the sun a shining light and the moon a derived light and determined for it phases - that you may know the number of years and account [of time]. Allah has not created this except in truth. He details the signs for a people who know.”

[Surah Yunus:5]

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: A quick activity with a torch will be done to introduce the concept of transparent, translucent and opaque objects.

Direct Instructions:

Teacher will discuss about:

- Light
- Transparent, Translucent and Opaque objects

Guided and Independent Practice:

1. Teacher will provide a torch, different kinds of materials and a recording worksheet.
2. A quick experiment will be done with those.

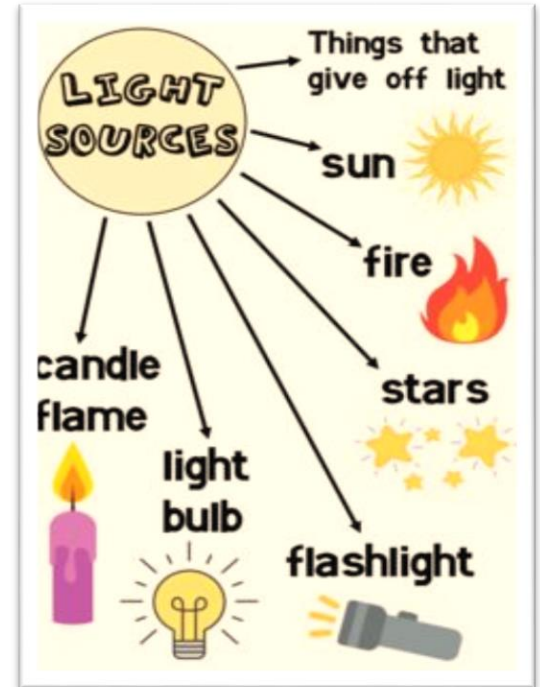
Class Work: Do Q1 of “*Stop and Ask Yourself*” on book page number 59 in your notebook.

Home Assignment: Do Q2 of STOP AND ASK YOURSELF on book page number 59 in your notebook.

Do Ex VI in your note book.

Suggested Video: Light <https://www.youtube.com/watch?v=d7yTlp4gBTI>

هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْحِسَابَ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحَقِّ يُفَصِّلُ الْآيَاتِ لِقَوْمٍ يَعْلَمُونَ



Lesson 02: Light and Sound in Everyday Life Light II

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to relate familiar physical phenomena (i.e. shadows, reflections and rainbows) to the behavior of light.

Teacher's Resource:

- Quiz questions from the previous lesson
- A candle
- Soft board display
- Explore Your World - Science Book IV

* اللَّهُ نُورُ السَّمَوَاتِ وَالْأَرْضِ

Soft board Display: Images given

Islamic Integration: Allah says in the Quran, *Allah is the Light of the heavens and the earth.*

When to instill it: _____

Instructional Stages:

Warmup Activity: Teacher will take a surprise quiz

Direct Instructions:

Teacher will discuss about shadows, reflections and rainbows

Guided and Independent Practice:

Students will conduct the activity given in the lesson at home and will share their notes with the class.

Teacher can also conduct the following three simple experiments to develop students interest in the subject and students will take notes after a good discussion.

Reflection of Light: https://www.youtube.com/watch?v=4TK2VLj_61c&t=169s

Refraction of Light: <https://www.youtube.com/watch?v=9n362snGUdw&t=129s>

Bending Light: <https://www.youtube.com/watch?v=3hO2EHpUWcg>

Class work:

1. Do Q3 STOP AND ASK YOURSELF on book page number 56 in your notebook.
2. Do Exercise VIII in your book.

Home Assignment:

Do Exercise Q III and IV in your notebook.

Lesson 02: Light and Sound in Everyday Life
Sound Energy
Echo

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define sound
- Define echo

Teacher's Resource:

- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Images given

Islamic Integration: It is a big blessing of Allah SWT that sound cannot travel through vacuum. There are always big explosions of the sun which create great noise. We are saved from those harmful sounds because there is a big vacuum between the sun and the earth.

Vocabulary
stretched
vibrating
rhythmic
vibrations
echo
sound waves

Then He turned towards the heaven
when it was 'still like' smoke,
saying to it and to the earth,
'Submit, willingly or unwillingly.'
They both responded, 'We submit
willingly.' [Surah Fussilat: 11]

ثُمَّ أَسْتَوَىٰ إِلَى السَّمَاءِ وَهِيَ دُخَانٌ فَقَالَ لَهَا وَلِلْأَرْضِ ائْتِيَا طَوْعًا أَوْ كَرْهًا
قَالَتَا أَتَيْنَا طَائِعِينَ ﴿١١﴾

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity:

Teacher will tell students that we are going to see 'sound' today
and will conduct the following simple experiment.

Sound:

<https://www.youtube.com/watch?v=37csXse35YQ&t=134s>

Direct Instructions: Teacher will discuss about:

1. Sound
2. Echo

Guided and Independent Practice:

Students will watch the suggested video and will take notes.
Teacher will take their feedback during and at the end of the video:

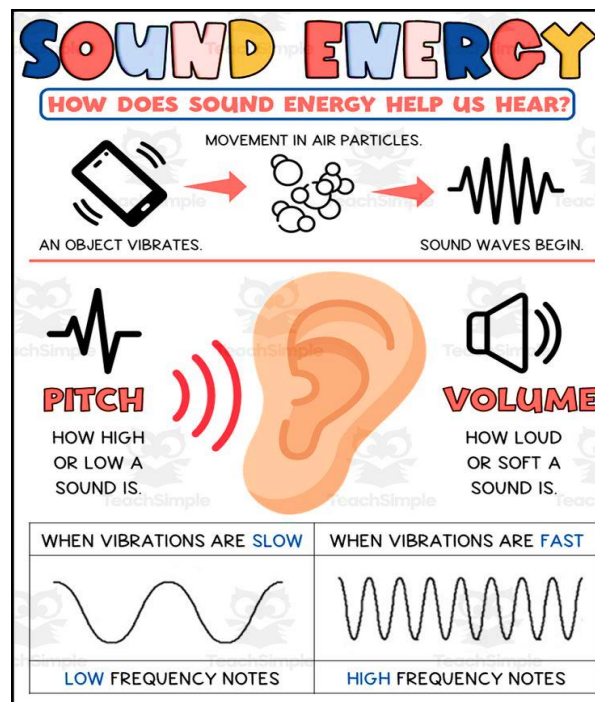
<https://www.youtube.com/watch?v=e2MA2r1fEH8>

Class Work: Do Q4 of STOP AND ASK YOURSELF on book
page number 59 in your notebook.

Home Assignment:

1. Do Exercise IX in your note book.
2. Read Lesson 2 for a class quiz.

Suggested Video: Sound <https://www.youtube.com/watch?v=gdGyvGPZ1G0>



STOP AND ASK YOURSELF

Q 1: List down three artificial and three natural sources of light.

Ans: Natural sources: a)Sun b) Moon c) Lightning

Artificial sources: a)Bulb b) Torch c) Mobile Light

Q 2: Identify transparent, translucent and opaque objects from the following list.

Ans: Water, milk, clear glass, tinted car windows, wax paper, curtains, plastic toy, pencil, eraser

Transparent	Translucent	Opaque
Water	Wax paper	Milk

Clear Glass	Tinted car windows	Curtains
		Plastic Toy
		Pencil
		Eraser

Q 3: What colour of light will be reflected from the following?

Ans: green pen, yellow balloon, red cap, orange candy, blue shirt, violet ribbon.

Green Pen	Green
Yellow Balloon	Yellow
Red Cap	Red
Orange Candy	Orange
Blue Shirt	Blue
Violet Ribbon	Violet

Q 4: What is sound and how does is echo?

Ans: Sound is actually vibrations made in the air which reach our ears.

It echoes because, sound also reflects from various surfaces. It does reflect from all kinds of surfaces like walls, tables and curtains. The harder the surface, the more it will reflect sound. Echo is a reflected sound that comes from a distance of more than 17 meters.

Lesson 03: Heat Energy

How is Heat Produced | Conduction | Convection | Radiation | Temperature and Thermometer

Estimated Time Required: 40 minutes

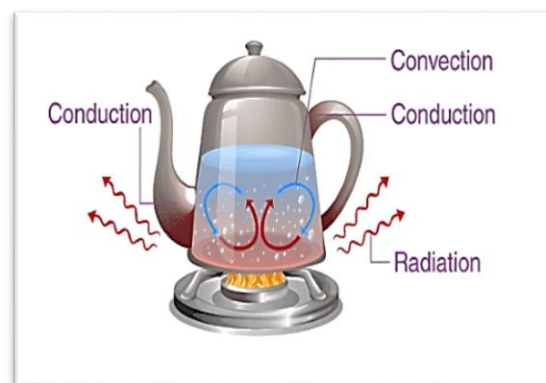
Objectives: Students will insha'Allah be able to:

- Define heat energy.
- Know three modes of heat transfer.
- Recognize thermometer as a temperature measuring device.

Teacher's Resource:

- Science Lab
- Soft board display
- Explore Your World - Science Book IV

Soft board Display:



For soft board display refer to the pictures given in book

Islamic Integration:

“And made [therein] a burning lamp [meaning the sun]. Surah An-Naba: 13]

وَجَعَلْنَا سِرَاجًا وَهَّاجًا ﴿١٣﴾

And indeed, We adorned the lowest heaven with ‘stars like’ lamps, and made them ‘as missiles’ for stoning ‘eavesdropping’ devils, for whom We have also prepared the torment of the Blaze.1 [Surah Al Mulk: 5]

Teacher will explain to students that the sun as a major source of heat energy on Earth, emphasizing how Allah has created it to sustain life by providing warmth and enabling photosynthesis.

وَلَقَدْ زَيَّنَّا السَّمَاءَ الدُّنْيَا بِمَصْبِيحٍ وَجَعَلْنَاهَا رُجُومًا لِلشَّيَاطِينِ وَأَعْتَدْنَا لَهُمْ عَذَابَ السَّعِيرِ ﴿٥﴾

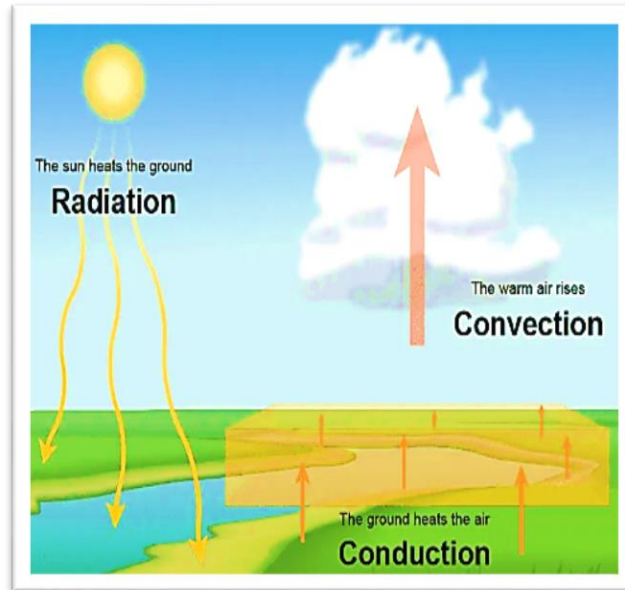
When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Quiz on the previous lesson will be conducted.

Direct Instructions:

1. Heat Energy
 2. Three modes of Heat Transfer
- Conduction
 - Convection
 - Radiation



Vocabulary

thermal

conduction

convection

radiation

thermometer

expand

contract

indicate

mercury

Guided and Independent Practice:

Students will watch a small video and will take notes covering following topics like heat energy, three modes of heat transfer and thermometer.

Class Work: Do Q1 STOP AND ASKE YOURSELF in the notebook.

Home Assignment:

Teacher will discuss with students about preparing the circuit in the next class and will ask them to bring the required material.

Do Q2 and Q 3 of STOP AND ASKE YOURSELF on book page number 62 in your notebook.

Do Exercise Q V in your book.

Suggested Video: <https://www.youtube.com/watch?v=HpCvWuvCUoA>



Lesson 03: Heat Energy Electrical Energy

Estimated Time Required:

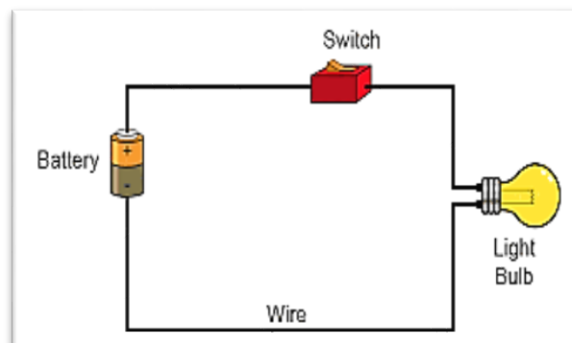
40 minutes

Objectives: Students will insha' Allah be able to:

- Define electrical energy.
- Know what is electric circuit?
- Make a simple electric circuit.

Teacher's Resource:

- Science Lab
- Soft board display
- Explore Your World - Science Book IV



Soft board Display: Image given

Islamic Integration:

And Allah has provided you shade out of what He created, and has given you shelter in the mountains. He has also provided you with clothes protecting you from the heat 'and cold', and armour shielding you in battle.

This is how He perfects His favour upon you, so perhaps you will 'fully' submit 'to Him'.

[Surah Al Nahl: 81]

وَاللَّهُ جَعَلَ لَكُم مِّمَّا خَلَقَ ظِلَالًا وَجَعَلَ لَكُم مِّنَ الْجِبَالِ أَكْنَانًا وَجَعَلَ لَكُم سَرِييلَ تَقِيكُمْ الْحَرِّ وَسَرِييلَ تَقِيكُمْ
بَأْسِكُمْ كَذَلِكَ يُتِمُّ نِعْمَتَهُ عَلَيْكُمْ لَعَلَّكُمْ تُسْلِمُونَ

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Teacher will quickly ask students to tell what's a circuit and how it is made.

Direct Instructions: Teacher will discuss about:

1. Electrical Energy
2. Circuit

Guided and Independent Practice:

1. After motivation activity students will be taken to the science lab where they will take out all the components needed to make a simple electric circuit i.e. bulb, switch and connecting wires.
2. Under teacher's guidance they will make a circuit.

Class Work: Do Q4 of STOP AND ASK YOURSELF on book page number 44 in your notebook.

Suggested Video: Electricity: <https://www.youtube.com/watch?v=t09pAwLICC4>



Vocabulary

transform

generate

powerhouse

mains

battery

switch

circuit

STOP AND ASK YOURSELF

Q 1: What is the other name for heat energy?

Ans: The other name for heat energy is Thermal Energy.

Q 2: What is the role of molecules in producing heat energy?

Ans: Heat is produced by the motion of the molecules present in the matter. The higher the movement of the molecules, the more the amount of heat produced in the substance.

Q 3: What are the three ways to transferring heat energy to various substances?

Ans: The three ways of transferring heat energy to various substances are:

- a) Conduction b) Convection c) Radiation

Q 4: What are two common sources of electricity in our everyday life?

Ans: The two common sources of electricity in our everyday life are:

- a) From the powerhouses
- b) From the cells

Exercise

I. What kind of energy conversion is taking place during the use of the following?

Ans. a) Electric Heater:

Electrical energy to Heat

b) Burner

Chemical energy to heat and light

c) Battery powered toy

Electrical energy to mechanical

II. Name six machines in your home using energy.

Draw diagrams to show what type of energy conversions are taking place during their use.

- Ans.**
- a. Fridge > Electrical > Mechanical > Thermal
 - b. Iron > Electrical > Heat
 - c. Washing Machine > Electrical > Mechanical
 - d. Blender > Electrical > Mechanical
 - e. Generator > Mechanical > Electrical
 - f. Torch > Chemical > Light

III The picture shows a water sprinkler in a garden sprinkling the water. Can you explain why the colors of rainbow are appearing.

Ans. Because of the drops of the sprinkler refract the light from the sun into a color spectrum.

In the lesson, we only give the concept of reflection of light while in that rainbow formation reflection, refraction and dispersion, all occurred. So here the reason might be reflection of light.

IV. Look at the following items. What happens to the light rays when white light falls on it? Which light will be absorbed and which will reflect?

Ans. a) Laptop looks black because all the colours of light are absorbed.

- b) In rose red light will be reflected and all the other rays will get absorbed.
c) In toy duck yellow light will be reflected and other rays will be absorbed.

V. Look at the following pictures and writes how the heat is being transferred in each case.

Ans. a) In first picture, through conduction heat is being transferred.

b) In second picture, through convection heat is transferred with in water.

c) In third picture, through radiation heat is being transferred.

VI. Sort out the transparent, translucent and opaque from the following. Which of the items will make the best shadow?

Ans. Book and Wall will cast best shadows as they are opaque objects.

Transparent	Translucent	Opaque
A glass jug	Plastic sheet	Book
Glass Window	LED bulb	Wall
	Tissue paper	

VII. Look at the following pictures of two circuits. Which one do you think will make the bulb glow and why?

Ans. The left one will make the bulb glow because the connections are proper and not broken.

VIII. State true or false. Correct the false statements.

- a) **Black objects absorb less light than white objects.** (F)
Black objects absorb all the colours of light than white objects.
- b) **Rainbow is formed in the sky just opposite to the sun.** (T)
Due to total internal reflection
- c) **The shadow of an object is always of the same size as the object.** (F)
The shadow of an object is not always the same size as the object, it depends on the position of sun.
- d) **White light is made up of seven colors.** (T)
- e) **Transmission and conversion of energy are the same things.** (F)
Transformation and conversion of energy are not the same things.
- f) **Oil is a nonrenewable resource while water is renewable.** (T)
- g) **With excessive use even the renewable resource of energy will come to an end.** (F)
Renewable energy sources are unlimited.

IX. a) Why an echo cannot be produced in a small room?

Ans. We can't hear an echo in a small room because the minimum distance between the source and reflecting object should be 17 m for an echo to be heard

b) Why is shadow always black in color?

Ans. Shadows are black in color due to the absence of light. A shadow is formed due to the absorption of light by an object or a light emitting source.

a) Why is oil a non-renewable source of energy?

Ans. Yes, oil is an example of a non-renewable resource. This is because oil is a fossil fuel, which means it is formed from the remains of plants and animals that lived millions of years ago. Once it is used, it cannot be replaced.

FORMS OF ENERGY

TRANSPARENT, TRANSLUCENT AND OPAQUE OBJECTS

You will need:

- A Torch
- A Piece of Dark Fabric
- A Book
- A Piece of Aluminum Foil
- A Piece of Clear Wrap

Hold each object in front of the lit torch. Predict if the Light from the torch will shine through the objects. Will you be able to see light on the other side of the object?

OBJECT	PREDICTION (Y/ N)	OBSERVATION

FORMS OF ENERGY

TRANSPARENT, TRANSLUCENT AND OPAQUE OBJECTS

You will need:

- A Torch
- A Piece of Dark Fabric
- A Book
- A Piece of Aluminum Foil
- A Piece of Clear Wrap

Hold each object in front of the lit torch. Predict if the Light from the torch will shine through the objects. Will you be able to see light on the other side of the object?

OBJECT	PREDICTION (Y/ N)	OBSERVATION

FORMS OF ENERGY

TRANSPARENT, TRANSLUCENT AND OPAQUE OBJECTS

You will need:

- A Torch
- A Piece of Dark Fabric
- A Book
- A Piece of Aluminum Foil
- A Piece of Clear Wrap

Hold each object in front of the lit torch. Predict if the Light from the torch will shine through the objects. Will you be able to see light on the other side of the object?

OBJECT	PREDICTION (Y/ N)	OBSERVATION

Unit 07: Forces and Motion

SNC Learning Outcomes for Unit 07

All the students should be able to:

- Describe force and motion with examples from daily life.
- Identify gravity as a force that draws objects to the Earth.
- Investigate that friction force works against the direction of motion.
- Provide reasoning with evidence that friction can be either detrimental or useful under different circumstances.
- Recognise that simple machines, (e.g. levers, pulleys, gears, ramps) help make motion easier (make lifting things easier, reduce the amount of force required, change the distance or change the direction of the force)
- Make simple levers to lift objects (such as books) in the classroom

Lesson 01: Forces and the motion of objects Force | Motion

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Observe and understand what force is?
- Define force and motion.

Teacher's Resource:

- Soft board display
- Explore Your World - Science Book IV

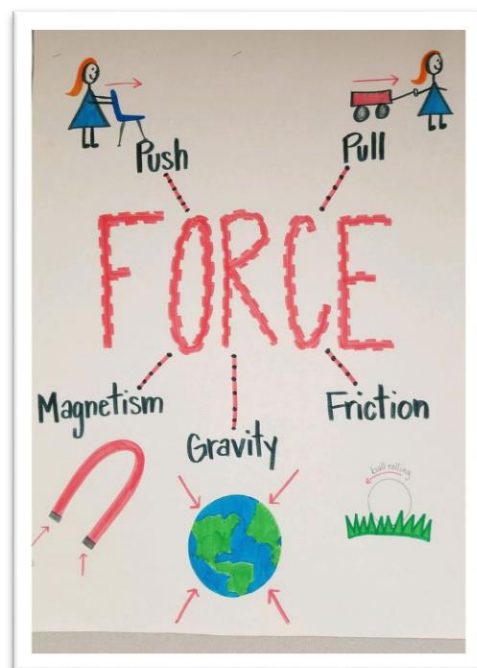
Soft board Display: Images given

Islamic Integration: You cannot even move without ALLAH'S will. This is what we have to always remember. The push, the pull, the drag and the lift all the actions we do is due to ALLAH'S will.

Vocabulary
force
motion
pull
push
gravity
friction

He causes the dawn to break, and has made the night for rest and 'made' the sun and the moon 'to travel' with precision. That is the design of the Almighty, All-Knowing. [Surah Al An'am: 96]

When to instill it: at the beginning of the lesson



Instructional Stages:

Warmup Activity: Teacher will introduce the topic with the motivation activity i.e. she will pull the chair and push the chair and will ask questions to tell students that all the things we do through force and the movement created by it is motion.

فَالِقُ الْإِصْبَاحِ وَجَعَلَ اللَّيْلَ سَكَنًا وَالشَّمْسَ وَالْقَمَرَ حُسْبَانًا ذَلِكَ تَقْدِيرُ الْعَزِيزِ الْعَلِيمِ

Exploring ramps and friction

Materials needed:

- Materials to make ramps; you can use cardboard or wood planks!
- Variety of toy cars
- Variety of textured materials to create friction – a hand towel, sandpaper, and rubber mats. Foil paper, a piece of rug, or mud can also be used.
- Tape to secure materials if necessary so they do not slip off the ramps.
- Stopwatch and measuring tape to see

Direct Instructions: Teacher discuss about forces and motion.

Guided and Independent Practice:

After that students will watch a video in order to gain better understanding and will solve simple worksheets:

Forces: <https://www.youtube.com/watch?v=WWyvS2FcnJA>

Class Work: Watch the video and fill out the worksheets.

Homework Assignment: Do Q1 of STOP AND ASK YOURSELF in your notebook.

TYPES OF FORCE

FRICTION FORCE



SPRING FORCE



BUOYANT FORCE



GRAVITY FORCE



DRAW FORCE



APPLIED FORCE



ELECTRIC FORCE



MAGNETIC FORCE



NORMAL FORCE



Lesson 01: Forces and the motion of objects

Force of Gravity | Gravity and motion

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

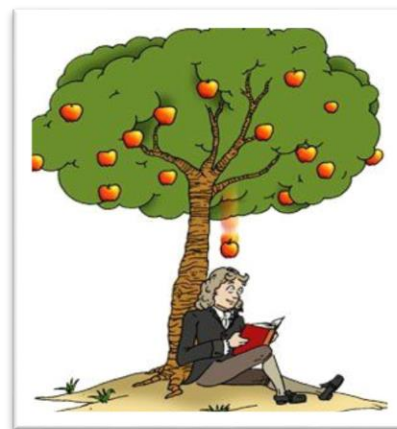
- Identify gravity as a force that draws objects to Earth.

Teacher's resource:

- Soft board display
- Explore Your World - Science Book IV

Softboard Display: Image given

Islamic Integration: Surah Al-Anbiya (21:33): "And it is He who created the night and the day, and the sun and the moon, all [in] an orbit they are swimming." This verse describes celestial bodies moving in orbits, which can be related to the concept of gravitational forces keeping them in their paths.



Activity

Materials:

- Small objects of different weights (e.g., a feather, a small rubber ball, a crumpled piece of paper, a pencil)
- A ruler or a tape measure
- A timer (optional)

Activity Steps:

1. Demonstration:

- Show the students how gravity works by dropping two different objects from the same height, like a rubber ball and a crumpled piece of paper.
- Drop them simultaneously and observe what happens. The ball will hit the ground first because it is less affected by air resistance compared to the paper.

2. Activity:

- Divide the students into small groups and give each group a set of objects.
- Have them predict which object will hit the ground first when dropped from the same height.
- Let each group drop their objects one at a time from the same height and observe the results.
- Measure and record the time it takes for each object to fall if you have a timer.

3. Discussion:

- Ask the students to share their observations. Discuss why some objects fall faster than others. Explain that gravity pulls all objects towards the Earth at the same rate, but air resistance affects some objects more than others.
- Reinforce the idea that gravity is a force that acts on everything, even though we might not always see it directly.

When to instil it: at the beginning of the lesson

Instructional Stages:

Warm up Activity: Teacher will share the story of Newton:

Direct Instructions: Teacher discuss about Force of Gravity and Gravity and Motion

Guided and Independent Practice: In order to introduce the topic teacher will tell the story of scientist named Newton who discovered the concept of gravity for the first time.

After that students will read the book page number 66 and 67 in pairs and will explain the topic to the whole class.

Class Work: Do Q2 and Q4 STOP AND ASK YOURSELF on book page number 67 in your notebook.

Home assignment: Do Q3 STOP AND ASK YOURSELF on book page number 67 in your notebook.

Vocabulary

discovery

effort

direction

attract

stable

downward

STOP AND ASK YOURSELF

Q 1: Define force and motion with examples.

Ans: Force is an action which changes the shape, size and motion of an object. Force can also be explained:

1. It is a push or pull acting on a body.
2. It is needed to move and stop the body.
3. It also changes the direction and position of the body.

Examples: Throwing a ball and catching it back

Q 2: What is the force of gravity? How does it affect moving objects?

Ans: The force that attracts every object to the center of the earth is called gravity.

Gravity pulls everything present on earth that has mass and occupies some space.

Earth holds everything present on its surface. All objects on earth experience a force of gravity that is directed "downward" towards the center of the earth.

Q 3: Why is it hard to climb up a flight of stairs compared to going down the same stairs?

Ans: Because, as we climb up we are going against the gravity and when an object moves against gravity, it needs a lot of energy to do so.

Q 4: Discuss in pairs. How does the swing go up and why does it come back?

Ans: When sitting on a swing, the swing does not move until you are pushed or you pump your legs, creating the force that sets you in motion. But, you continue swinging, without extra pumping, until the friction of the air and the swing chain resist the motion. Gravity pulls you down, when you ride high.

Lesson 02: Force of Friction Project

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Investigate that friction force works against the direction of motion.
-
- Explore different surfaces, different friction.

Teacher's resource:

- Power point presentation
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Vocabulary

invisible

produced

rub

opposite

hovercraft

inflate

air pocket

underneath



Islamic Integration: Surah Al Dhariyat: We built the universe with 'great' might, and We are certainly expanding 'it'.

When to instill it: at the beginning of the lesson

Instructional Stages:

Warm up Activity: Teacher will do paper, pencil and rock activity.

When we drop a paper, a pencil and a rock from the same height, the paper takes longer to reach the ground. Why? A feather experiences more air resistance because it is lighter and has a greater surface area.

Direct Instructions: Teacher discuss about Friction: Different surfaces, Different friction. Students will watch a video to understand how the hovercraft will be made.

<https://www.youtube.com/watch?v=DikofrxCiXs>

Guided and Independent Practice: After the motivation activity students will be shown a voiceover power point presentation in order to explain the topics in detail: Friction and Different surfaces, different friction.

Class Work: Do Q1 of STOP AND ASK YOURSELF on book page number 70 in your notebook.

Home Assignment: Project: Do Ex II, IV in the book and V in the notebook.

Lesson 02: Force of Friction

Benefits of Friction

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Distinguish between gravity and friction.
- Understand benefits of friction and its disadvantages as well.

Teacher's resource:

- Powerpoint presentation
- Soft board display
- Explore Your World - Science Book IV

لَسْتَوُوا عَلَى ظُهُورِهِ ثُمَّ تَذْكُرُوا نِعْمَةَ رَبِّكُمْ إِذَا اسْتَوَيْتُمْ عَلَيْهِ وَتَقُولُوا سُبْحَنَ الَّذِي سَخَّرَ
لَنَا هَذَا وَمَا كُنَّا لَهُ مُقْرِنِينَ ﴿١٣﴾

Soft board Display: Images given

وَأَنَّا إِلَىٰ رَبِّنَا لَمُنْقَلِبُونَ ﴿١٤﴾

Islamic Integration:

When to instill it: at the beginning of the lesson

Instructional Stages:

Warm up Activity: Teacher will ask students to quickly list down some activities where friction helps. Some examples are here:

- | | |
|--|------------------------------------|
| 1. Driving of a vehicle on a surface | 5. Writing on notebook/ blackboard |
| 2. Applying brakes to stop a moving vehicle | 6. Flying of aero planes |
| 3. Dusting a foot mat/ carpet by beating it with a stick | 7. Drilling a nail into wall |
| 4. Walking on the road | 8. Lighting a matchstick |

Direct Instructions: Teacher discuss about Gravity v/s Friction and Benefits and disadvantages of friction.

Guided and Independent Practice: After recalling the previous lecture students will be shown a voiceover power point presentation in order to explain the topic in detail.

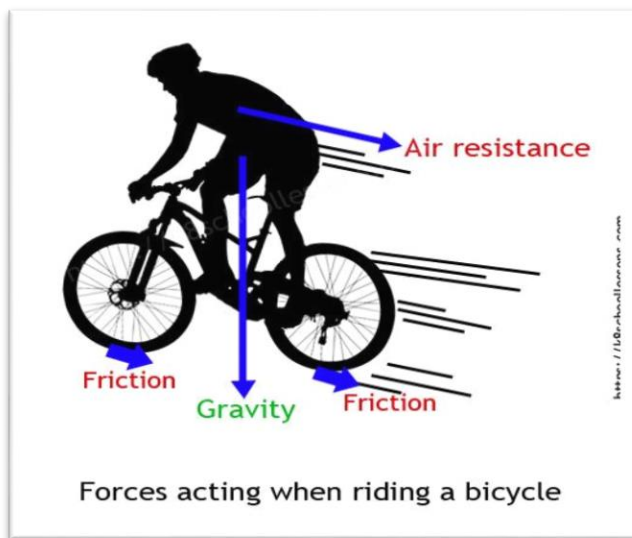
The PPT will cover following topics like Gravity v/s Friction and Benefits and Disadvantages of friction.

Class Work:

1. Do Ex I and VI in your book.
2. Discuss III, VII, VIII and IX verbally.

Home assignment: Do III, VII, VIII and IX in your note book.

Vocabulary
resistance
preventing
movement
productivity



STOP AND ASK YOURSELF

Q 1: What is friction? How does it affect moving objects?

Ans. Friction: It is a force. It is produced when two surfaces rub against each other. Friction works against motion.

Q 2: Why do we feel the floor is slippery?

Ans: We feel the floor is slippery because of less friction.

Q 3: What is one common property between gravity and friction?

Ans: Both forces help to hold objects.

Q 4: Write one advantage and one disadvantage of frictional force.

Ans: Advantages: It helps us to walk on the Earth and it provides grip to our vehicles to move on the roads.
Disadvantage: Friction cause more waste of energy.

Lesson 03: Simple Machines

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

Recognize that simple machines, (e.g., levers, pulleys, gears, ramps) help make motion easier (e.g., make lifting things easier, reduce the amount of force required, change the distance, or change the direction of the force).

Teacher's resource:

- Basket full of simple everyday use items

- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: (19:25) Shake the trunk of the palm-tree towards yourself and fresh and ripe dates shall fall upon you.

When to instill it: at the beginning of the lesson

Instructional Stages:



Warm up Activity: Teacher will show everyday use things to students and will elicit students' knowledge on them (scissors, toy wheel, slope and inclined surface, toy cycle, toy shovel etc.)

Direct Instructions: Teacher discuss about different simple machines

Guided and Independent Practice:

a simple machine experiment:
how to make a simple screen pen

<https://www.youtube.com/watch?v=VAFrS1MPTcM>

Teacher will distribute/show a worksheet with different machines and students will tell which ones can be called simple machines.

Class Work: Students will complete the worksheet.

Home assignment: Do Q1 and Q2 of STOP AND ASK YOURSELF in the notebooks. Prepare the screen pen and check its functionality at home.

Vocabulary

simple machines

applied force

gear

pully

ramp

lever

fulcrum

grooved wheel

fixed axle

grinders

slope plane

STOP AND ASK YOURSELF

1. Write definition of the followings:

i. Lever

A lever is a machine made of a bar or rod, it is turned around a fixed point called fulcrum, it is used to lift or move heavy objects.

When a force is applied to one end of the fulcrum, the weight on the other hand is lifted.

ii. Gear

A gear is a wheel that has teeth along the wheel. Different sizes of gears are used in machines to increase its force and speed.

iii. Ramps

A ramp is simply a slope plane. It is used to carry heavy loads. It has two surfaces; one is straight and other is at an angle. Less force is required to raise the heavy objects from bottom to top.

iv. Pulley

A pulley is a grooved wheel and a fixed axle. A rope is passed over a pulley to lift heavy objects. Simple pulley is used to raise flags.

Q 2: Write one example for each machine in our everyday life.

Ans:

1. **Lever:** Hammer and Sea Saw
2. **Gear:** In cars, bicycles and grinders
3. **Ramp:** Inclined plane
4. **Pulley:** Simple fixed pulley is used in wells to fill a bucket of water and lift it upward.

Exercise

I. Name each of the following and give one example for each.

1. The force that opposes the motion of one surface across another

Friction: Rubbing your hands

2. The force that pulls every object towards the earth.

Gravitational Force: Falling apple from the tree

II. Look at the picture and then answer the following questions:

1. Which force causes motion when a boy moves down a slide?

Gravitational force

2. Indicate the direction of motion using a blue arrow.

3. Indicate the direction of friction using a red arrow.

4. Which of the two tasks is difficult and why? Moving up the slide or sliding down the slide.

Moving up the slide is difficult because it is against the gravity and motion against the gravity needs more effort.

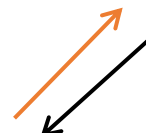
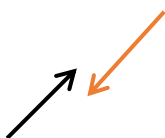
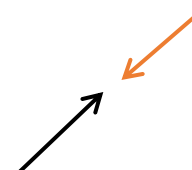


III. Why does the merry-go-round come to a stop after sometime even if we do not stop it?

Ans. Due to the resistive forces, the frictions in the parts of merry-go-round and air resistance will stop it even if we can't stop it.

IV. In the following pictures, draw the arrow shows the direction of motion. Can you draw a red arrow to show the direction of friction?

Ans:



V. Look at the following pictures and answer the questions given below.

Suppose a car is driven on both roads applying the same engine power (force) each time.

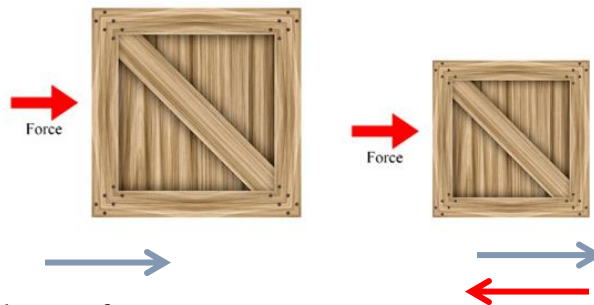
1. On which road will the car move with greater speed?

Ans. The road shown in the right side picture, the car will move with greater speed.

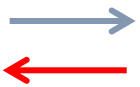
2. What is the reason for the difference in speed on the two roads when the same force is being applied by the engine?

Ans. The reason is the difference in the surface of the both roads. The road shown in left side picture is rough and has resistances while the road shown in right side picture is smooth and therefore will have less friction.

VI. These two boxes are being pushed towards right with equal forces. Which of these will move with a greater speed? In which directions will they move? Indicate with the help of arrows. In which direction will the force of friction act? Indicate with red arrows.



Ans. The small box will move faster.



Direction of motion

Friction Force

VII. Car drivers are advised to drive slowly during a rain shower or thunderstorm. Can you explain why?

Ans. Because the friction on the roads is decreased due to rain and it becomes slippery that's why if the driver drives fast there is much more chances of an accident.

VIII. Saima is moving her shopping trolley in the mall. She feels that the trolley is moving too fast and she needs to slow it down. How can she do it?

Ans. By applying force opposite to the direction of motion.

IX. Write two benefits of friction in our everyday life.

Ans.

- Friction also makes writing possible on paper. When a pencil is used, the friction of the paper causes the lead of the pencil to dry.
- It helps us to walk. The friction between the sole of a shoe and the surface of the ground prevents us from slipping.

Unit 08: Earth and its Resources

SNC Learning Outcomes for Unit 08

All the students should be able to:

- Recognise that earth's surface is made up of land and water and is surrounded by air.
- Recognise that water in rivers and streams flows from mountains to oceans or lakes.
- Identify some of Earth's natural resources that are used in everyday life (e.g. water, wind, soil, forests, oil, natural gas, minerals).
- Recognise that some remains (fossils) of animals and plants that lived on earth a long time ago are found in rocks, soil and under the sea.
- Differentiate between renewable and non-renewable resources of energy.
- Investigate the impact of human activities on Earth's natural resources.
- Suggest the ways to conserve natural resources.

Lesson 01: Physical Characteristics of the Earth Water on earth

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Observe and understand about the Earth's structure.
- Know the physical characteristics of Earth.
- Recognize that Earth's surface is made up of land and water and is surrounded by air.
- Recognize that water in rivers and streams flows from mountains to oceans or lakes.

Teacher's resource:


- Model of Globe
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Greatness of ALLAH S.W.T is really very vast. We as humans cannot imagine it. HE has created different kinds of energies that benefit us in different ways.

He has placed into the earth firm mountains, so it does not shake with you, as well as rivers, and pathways so you may find your way. [16:15]

When to instil it: at the beginning of the lesson

The Earth 

Solar System -> 3rd Planet ; Distance From The Sun -> 147.18 Million Km

Diameter -> Approximately 12,742 kilometers.

Earth's surface -> About 71% water and 29% land.

The circumference of Earth at the equator -> About 40,075 Km.

Highest point on Earth -> Mt. Everest, standing at 8,848 m.

Lowest point -> Challenger Deep in the Mariana Trench, 10994m below sea level.

Earth's atmosphere -> 78% nitrogen, 21% oxygen, and trace amounts of other gases.

The Great Barrier Reef, visible from space, is the world's largest coral reef system.

Earth's escape velocity -> the minimum speed needed is 11.2 kilometers per second.

Earth's axial tilt -> Approximately 23.5 degrees.

Earth revolves around the Sun -> 365 days, 5 hours, 59 min and 16 sec.

The earth rotates once every 23 hours, 56 min and 4 sec.

Layers of Earth's Atmosphere

Earth's Structure

STRUCTURE OF THE EARTH

وَالْقَىٰ فِي الْأَرْضِ رَوًسًا أَن تَمِيدَ بِكُمْ
وَأَنْهَرًا وَسُبُلًا لَّعَلَّكُمْ تَهْتَدُونَ

Instructional Stages:

Warmup Activity: Teacher will bring a model of globe and will ask students to locate Pakistan.

Direct Instructions: Teacher will discuss about the Physical Characteristics of Earth

- 71% water → 97% Salt water AND 3% fresh water
- 29% Land

Guided and Independent Practice:

Teacher will introduce the topic by showing Earth's model i.e. model of globe.

Students will observe on the globe that it is almost blue in color due to presence of 71% of water on the Earth.

They will observe different seas, rivers, lakes and oceans which will give them the concept of fresh and saline water as well.

Class Work: Do Q1 and Q2 STOP AND ASK YOURSELF in the notebook from page 76.

Homework Assignment: Do Exercise II and III in your notebook.

Vocabulary

blue planet

unusable

consumption

glaciers

atmosphere

vapours

reservoir

melted snow

Lesson 01: Physical Characteristics of the Earth Atmosphere around the earth

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Define atmosphere.
- Know the percentages of different gases in the air.
-

Teacher's resource:

- 5 different liquids (honey, water, cooking oil, liquid dish washer and corn syrup)
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Like everything else, energy is part of Allah's creation. The Qur'an encourages people to look intensely at Allah's creation and learn how to use it properly. The Sun is the most potent source of energy, heat and light, for the Earth: Did We not build seven strong [heavens] above you, and make a blazing lamp? (Qur'an 78:12)

When to instil it: at the beginning of the lesson

Vocabulary

surround

security blanket

protect

radiation

ultraviolet

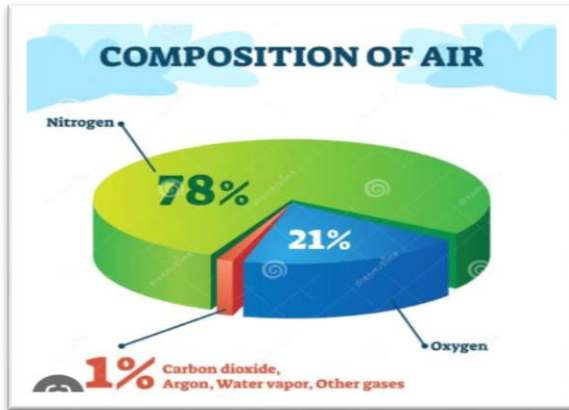
cosmic rays

protective shield

Instructional Stages:

Warmup Activity: Teacher will take students to the school ground in order to inhale fresh air.

Direct Instructions: Teacher will discuss about Atmosphere around the earth and why it is considered as security blanket. Through soft board material students will be able to view the percentages of different gases in the air.



Guided and Independent Practice:

Teacher will conduct the experiment with students and will explain to them about the layers of the earth.

Class Work: Do Q3 and Q4 STOP AND ASK YOURSELF in the notebook from page 76.

Homework Assignment: Draw a pie chart in your note book showing the percentages of different gases in the air.

Layers of the Earth's Atmosphere Experiment for Kids

Use this simple earth atmosphere activity for kids at home or in the science classroom. Kids can get a hands on visual feel for what the layers of the atmosphere might look and act through this simple atmosphere experiment.

Materials

- Honey
- Corn Syrup
- Dish Soap
- Water
- Vegetable Oil

Tools

- Narrow Jar
- Sticky Labels
- Pen

Instructions

1. Teacher layers the liquids in the clear jar with the heaviest and thickest on the bottom and adding until all liquids are poured. Pour the liquids in carefully in this order: honey, corn syrup, dish soap, water, vegetable oil
2. Using labels, starting from the top, label each layer: exosphere, thermosphere, mesosphere, stratosphere, troposphere

STOP AND ASK YOURSELF

1. Why does the earth appear blue from space?

Ans. The blue color is due to the large amount of water present on the surface of the earth.

2. How much of earth's water is available as fresh water?

Ans. 3 % of earth's water is available as fresh water.

3. What is atmosphere? Why is it called a security blanket?

Ans. Our planet earth is surrounded by a layer of gases. These gases stay around the earth due to the gravity of earth. This layer of gases is commonly known as air or atmosphere. Atmosphere is considered earth's **security blanket**. It protects everything on earth from harmful ultraviolet radiation of the sun. It also protects us from cosmic rays that come from space.

4. How much oxygen is there in the air?

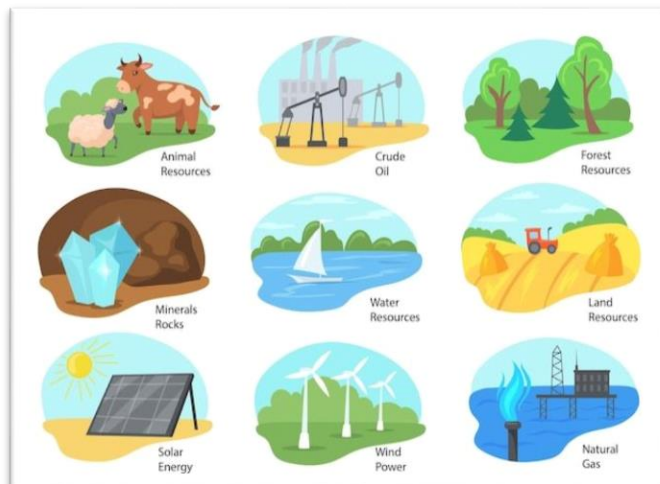
Ans. 21% oxygen is there in the air.

Lesson 02: Earth's Natural Resources Sunlight | Air | Water | Forest | Animals

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Know what are natural resources?
- Identify some of Earth's natural resources that are used in everyday life (e.g. sunlight, air, water, forest and animals).



Teacher's resource:

1. Wide pan and stuff for Oil Spill Activity (sand, stones, black oil, leaves, feathers, small plastic fish etc)
2. Laptop (Power point presentation)
3. Soft board display
4. Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Wastage of water is prohibited in Islam. We are advised to use bucket instead of the shower to avoid water wastage. We will be accountable for our deeds.

When to instill it: at the beginning of the lesson

Oil Spill Activity

The students will create an "environment" complete with animals and plants! Animals can be shown with fake fur and feathers. The kids can go outside and found some leaves for plants.

To really recreate the ocean, teacher can add blue food coloring and salt and can also build an island of rocks in the center of their pan.

Vocabulary

resources

minerals

fossils

survive

generating

essential

agriculture

construction

production

medicines

herbs

Instructional Stages:

Warm up Activity: Oil spill activity

Direct Instructions: Teacher will discuss about natural resources and how we are utilising or wasting them.

Guided and Independent Practice:

Students will watch a voiceover PPT to understand the topic better.

The PPT will cover following topics: natural resources including water, air, sunlight and other

Class Work: Do Q1 and Q2 of STOP AND ASK YOURSELF on book page number 82 in your notebook.

Homework Assignment Do Ex V and VI in your note book.

Vocabulary

transportation

tilling

wool

skin of animals

Lesson 02: Earth's Natural Resources

Soil | Natural Oil | Natural Gas | Minerals | Fossils

Estimated Time Required: 2 lessons of 40 minutes

Objectives: Students will insha'Allah be able to:

- Identify some of Earth's natural resources that are used in everyday life (e.g. soil, natural oil, natural gas and minerals).
- Recognize that some remains (fossils) of animals and plants that lived on Earth a long time ago are found in rocks, soil and under the sea.

Vocabulary

soil

habitat

burrows

minerals

ores

substance

petroleum

crude oil

compound

component

operate

refrigeration

fertilizers

agents

preserved

remains

fossils

Teacher's resource:

- Laptop
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Allah says in the Quran, "It is He who made the sun a shining light and the moon a derived light and determined for it phases - that you may know the number of years and account [of time]. Allah has not created this except in truth. He details the signs for a people who know." (10:5)

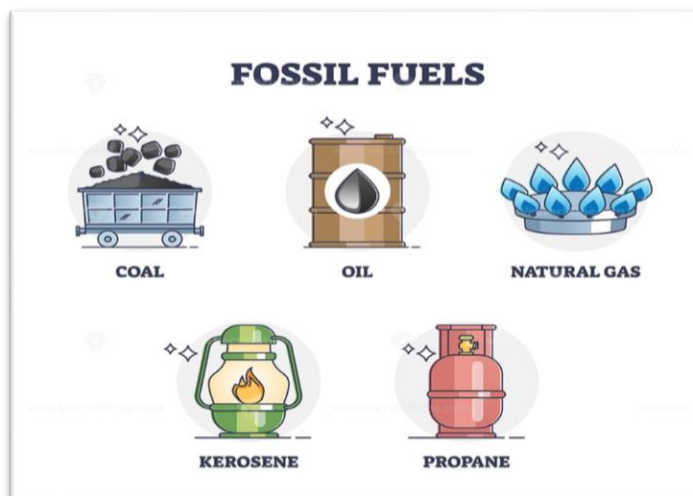
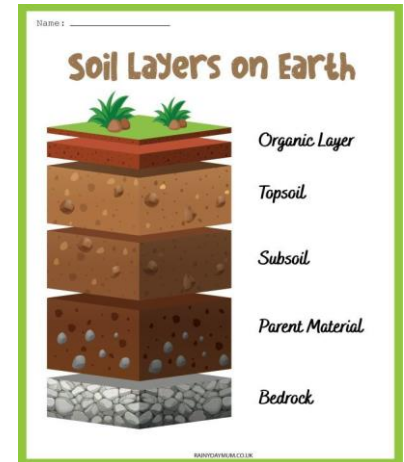
When to instill it: at the beginning of the lesson

Instructional Stages:

Direct Instructions: Teacher will discuss about Natural resources and Fossils.

Guided and Independent Practice:

Students will watch a voiceover PPT to understand the topic better.



The PPT will cover topics like natural resources natural oils, natural gas, soil etc.

Class Work: Do Q3 and Q4 of STOP AND ASK YOURSELF on book page number 82 in your notebook.

Home Assignment: Do Ex I in the book IV and VIII in the note book.

Lesson 02: Earth's Natural Resources Human Impact on Natural Resources

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Think on human impact on natural resources.
- List the ways to conserve the natural resources.

Teacher's resource:

- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Images given

Islamic Integration: "And do no mischief on the earth, after it has been set in order, but call on Him with fear and longing (in your hearts): For the Mercy of Allah is (always) near to those who do good."(7:56)

When to instill it: at the beginning of the lesson

Instructional Stages:

Warmup Activity: Revising previous lecture to create a connection.

Direct Instructions: Teacher will discuss about human impact on natural resources and conservation of natural resources

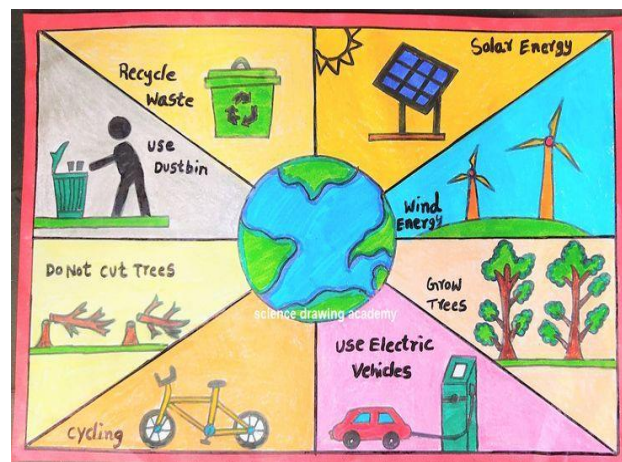
Guided and Independent Practice:

After the motivation activity teacher will ask students to read the book page number 81 and then discussion will be done.

After doing this, teacher will ask students to make posters and slogans on conservation of natural resources. Students will take these slogans to different classes and create awareness on such a significant topic.

Class Work: Do Exercise IX in your notebook.

Home Assignment: Students will create a poster to show to junior or senior classes.



Vocabulary

accountable

polluted

spoiled

infertile

STOP AND ASK YOURSELF

1. Name three important natural resources of earth without which we cannot survive.

Ans. The three important natural resources of earth without which we cannot survive are: Sunlight, air and water.

2. How much of earth surface is covered with forest?

Ans. More than 31 percent of earth's land surface is covered with forests.

3. Write three functions of soil.

Ans. The main functions of soil are:

1. Plants and forests grow on the soil.
2. It is a habitat for different kinds of small animals. Most of these animals live on the surface of the soil while some like rabbits and mice live in burrows and holes made under the soil.
3. Soil is also used to make bricks and pottery.

4. For what do we use natural gas in our homes?

Ans. We use natural gas in our cooking ranges to cook and bake the food items.

Exercise

- I. Look at the following pictures and mention which resources of the earth are related to them.

(left to right) a) Wood
b) Sun light (Solar energy)
c) Soil



- II. Make a pie chart showing the ratio of salt water and fresh water on the earth. How much of that water is salt?

Ans. 97% of the Earth's water is salt water.

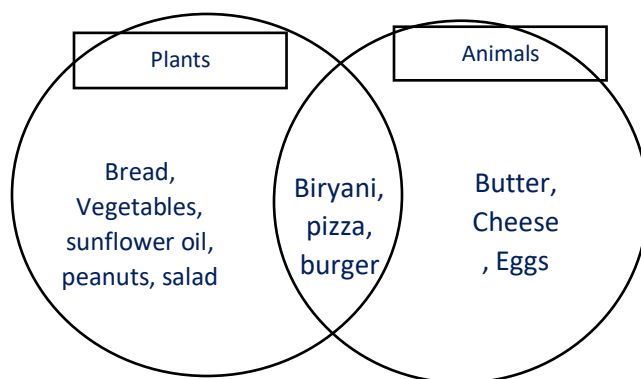
- III. Draw a diagram showing snow melting from the peaks of the mountains and making its way to the valleys as rivers or waterways.

Ans.

- IV. What are fossils and what do we learn from their study?

Ans. The preserved remains of plants and animals over thousands of years ago are called fossils. Science of study of fossils is called paleontology. It is the primary source of information about history of life on Earth.

- V. Make a Venn diagram, showing food items obtained from plants and from animals.



- VI. Make a list of the things we get from animals.

Ans. The things we get from animals are:

- Butter

- Milk
- Cheese
- Yoghurt
- Meat
- Leather

VII. Humans have always consumed cooked food. What fuel was used for cooking before gas was discovered?

Ans. Before natural gas was discovered people used wood as a fuel for cooking.

VIII. Did Allah (سبحانه وتعالى) create all the resources in unlimited amount? What are the instructions in Quran and Sunnah for their use?

Ans. When the Earth was made; Allah (سبحانه وتعالى) only sent estimated amount of these resources. Just enough for the needs of humans, animals and other living things. He created everything in an appropriate amount. It is mentioned in Surat-al-Aala that He created everything in proper proportion.

سَبِّحْ اسْمَ رَبِّكَ الْأَعْلَى ۝ الَّذِي خَلَقَ فَسَوَّى ۝ وَالَّذِي قَدَّرَ فَهَدَى ۝

“Glorify the Name of your Lord, the Most High, Who created and ‘perfectly’ fashioned ‘all’, and The One who kept proper measure (of resources) and then guided (accordingly).”

(Surah-Al-A'la Ayaat 1-3)

Project Work (Given on book page number 84)

Earth in the Solar System

SNC Learning Outcomes for Unit 09

All the students should be able to:

- Describe and demonstrate the solar system with the Sun at the center and the planets revolving around the Sun.
- Identify the sun as a source of heat and light for the solar system.
- Recognise that the Earth has a moon that revolves around it, and from the Earth the moon looks different at different times of the month.
- Investigate and describe how day and night are related to Earth's daily rotation on its axis, and provide evidence of this rotation from the changing appearance of shadows during the day.
- Describe how seasons in earth's Northern and Southern hemispheres are related to Earth's annual movement around the Sun.
- Illustrate and explain how solar and lunar eclipses occur.

Lesson 01: The Solar System

Estimated Time Required: 40 minutes

Objectives: Students will In-Sha-Allah be able to:

- Know what is solar system and its parts.
- Observe and recognize planets of the solar system.



Teacher's Resource:

- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: "He (ALLAH) is the one who make planets stand without pillars." (Islamic Quotes)

When to instil it: _____

Instructional Stages:

Warm up Activity: Teacher can bring a cut out (as shown in the photo) and nine small balls/ plastic caps of bottles in different colours to check students' knowledge before giving any instructions. They will place small balls on the sheet.



Direct Instructions: Teacher will discuss about the Solar System and:

- Orbit
- Planets of solar system
- Asteroid and comets

Guided and Independent Practice:

Students will re-arrange the planets on the sheet after the discussion.

Class Work: Do Q1 and 2 STOP AND ASK YOURSELF on book page number 88 in your notebook.

Homework Assignment:

Students can create an edible Solar System at home, with supervision, take a photo and paste in the notebook.

Do Exercise I in your notebook.

Do Q5 and 6 STOP AND ASK YOURSELF on book page number 88 in your notebook.

Vocabulary
giant
revolve
asteroids
comets
orbits
imaginary
astronomer
inner planet
outer planet
gas giant
axis
estimated
farthest
Hubble
telescope

Lesson 01: The Solar System

Atmosphere around the earth | Inner and Outer Planets

Estimated Time Required: 40 minutes

Objectives: Students will In-Sha-Allah be able to:

- Define inner and outer planets.
- Discuss fun facts

Teacher's Resource:

- Model of planets
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: "Do not prostrate to the sun or the moon, but prostrate to ALLAH who created them." (The Quran 41:37)

When to instill it: At the beginning of the lesson



Instructional Stages:

Warm up Activity: Teacher will discuss the previous lesson and ask students what they remember.

Direct Instructions: Teacher will discuss about the Solar System and:

- Inner and Outer Planets
- Fun facts about Planets

Guided and Independent Practice:

- Students will watch a video and will try to remember things for a quick quiz.
<https://www.youtube.com/watch?v=6HaQf3QGrfc>
- Teacher will give time to students to read the fun facts given on book page number 88 and then one by one each students will read it louder and discussion will be done on each point.

Class Work: Do Q3 and Q4 STOP AND ASK YOURSELF in the notebooks.

Home Assignment:

1. Do Exercise II and III in your notebook.
2. Do Exercise IV in your book.

STOP AND ASK YOURSELF**1. What is the solar system? What does it include?**

Ans. The sun is a giant star. Many objects in outer space revolve around the sun. Together the sun and all objects revolving around it make up the solar system. The objects that go around the sun include planets, asteroids, moons, comets, dust and gas.

2. Name the eight planets of our solar system.

Ans. The eight planets of our solar system are:

1. Mercury
2. Venus
3. Earth
4. Mars
5. Jupiter
6. Saturn
7. Uranus
8. Neptune

3. Name the inner and outer planets. What is the difference between them?

Ans. Inner planets contain the four planets closest to the sun i.e. Mercury, Venus, Earth and Mars. The outer planets include Jupiter, Saturn, Uranus and Neptune.

The inner planets have solid surfaces, so you could stand on any of them on the other hand outer planets are not solid but huge balls of gases. They are also known as gas giants.

4. Where are most asteroids present?

Ans. Many asteroids can be found in the region of space between Mars and Jupiter.

5. Which is the largest planet of the solar system?

Ans. Jupiter is the largest planet in the solar system.

6. Which is the smallest planet of the solar system?

Ans. Mercury is the smallest planet in the solar system.

Lesson 02: Moon and the Lunar Cycle

The Lunar Cycle | Phases of the Moon | What causes the Moon Phases? | Islamic of Hijri Calendar

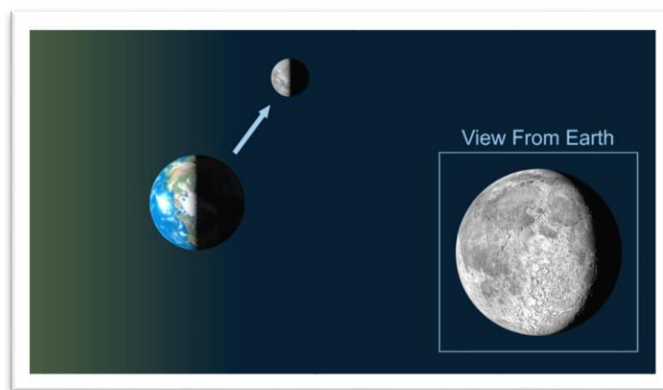
Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Know and Understand Lunar Cycle (Phases of the moon)
- Know waxing half and waning half.
- Observe and understand Islamic Calendar

Teacher's Resource:

1. Chart paper (phases of the moon)
2. Soft board display
3. Explore Your World - Science Book IV



Soft board Display: _____

Islamic Integration: Allah says in Surah Yaseen: “We have set phases for the moon, until it ends up looking like an old branch of date palm tree again.”

When to instill it: At the beginning of the lesson

Instructional Stages:

Warm up Activity: Teacher will show a chart paper with phases of the moon drawn on them.

Direct Instructions: Teacher will discuss about:

1. Lunar Cycle
 - Phases of the moon
 - Waxing half and waning half
2. Islamic Calendar

Guided and Independent Practice:

A quick animation will help in this regard. Students will watch it a few times and will try to understand what's happening.

https://www.youtube.com/watch?v=LHD4Pk0D8_g

Vocabulary
lunar
crescent
canopy
moon phases
waxing half
waning half

Class Work: Do Q1 and Q2 of STOP AND ASK YOURSELF on book page number 91 in your notebook.

Homework Assignment:

1. Do Q3 and Q4 of STOP AND ASK YOURSELF on book page number 91 in your notebook.
2. Do Ex V and VI in your note book.

STOP AND ASK YOURSELF

1. How many days does the moon take to circle around the earth?

Ans. It takes the moon twenty-nine and a half days to complete its journey around the earth.

2. What is a lunar cycle?

Ans. These twenty-nine and a half days make up a lunar cycle or a lunar month. During a lunar cycle the moon takes different shapes that we see in the sky.



Waxing Half



Waning Half

3. What do the words waxing and waning mean?

Ans. The words waxing and waning means:

‘**Waxing**’ means growing or expanding.

‘**Waning**’ means shrinking or decreasing.

4. Draw the waxing and waning moons.

Ans.

Lesson 03: Earth's Motion Rotation of the Earth | Effects of Rotation of Earth Revolution of the Earth

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Know and understand rotation of the earth.
- Impact of rotation of the earth on the shadows.
- Know and understand revolution of the earth.

Teacher's Resource:

- Laptop (Power point presentation)
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration: Allah says in the Quran, “Surely, in the creation of the heavens and the earth, and in the alteration of night and day, there are signs for the people of wisdom.” (Surah Al Imran)

When to instill it: _____

Instructional Stages:

Warmup Activity: Teacher will quickly create a sun dial in front of students and will show the rotation of the earth with the help of a torchlight.





Rotation of Earth – Metal Tin Plate

- Bright golf ball
- Small blue bouncy ball
- Marker
- Metal pie tin
- Hot glue, glue gun or super adhesive

Fix the yellow ball (the Sun) as shown in the photo. Draw land and seas on the blue ball and rotate the plate to show to students.

Vocabulary

rotation

revolution

earth day

stationary

elliptical

path

tilt

hemisphere

northern

southern

<https://www.youtube.com/watch?v=CQViTzK0AsA>

Direct Instructions: Teacher will discuss about:

1. Rotation of the Earth
 - Day and Night
 - Impact on Shadows
2. Revolution of the Earth

Guided and Independent Practice:

1. Students will watch a voiceover power point presentation in order to explain the topic in detail, covering topics like rotation of the Earth (Day and Night), Impact of rotation on shadows and revolution of the Earth.
2. Teacher will also demonstrate by using a simple prop. Earth should also be coloured so that students can see the change in sides etc.

Class Work: Do Q1 and Q2 of STOP AND ASK YOURSELF in the notebook.

Homework Assignment: Do Q3 and Q4 of STOP AND ASK YOURSELF in the notebook.

STOP AND ASK YOURSELF

1. How do days and nights come one after the other?

Ans. We get day and night because the Earth spins (or rotates) on an imaginary line called its axis and different parts of the planet are facing towards the Sun or away from it. It takes 24 hours for the world to turn all the way around, and we call this a day.

2. How do we get four seasons in a year?

Ans. We get four seasons in a year due to earth's motion. The Earth's revolution around the sun causes change in the seasons.

3. Why does the Sun rise from East and sets in the West?

Ans. The earth rotates from the west to east and the sun appears to be moving in the opposite direction. The sun seems to rise from the east and seems to set in the west.

4. At what time the shadows become the shortest?

Ans. The shadows are long in the morning, became shortest around noon, and then got long in the afternoon.

Lesson 04: The Lunar and Solar Eclipse

The Lunar Eclipse | Types of Lunar Eclipse

Estimated Time Required: 40 minutes

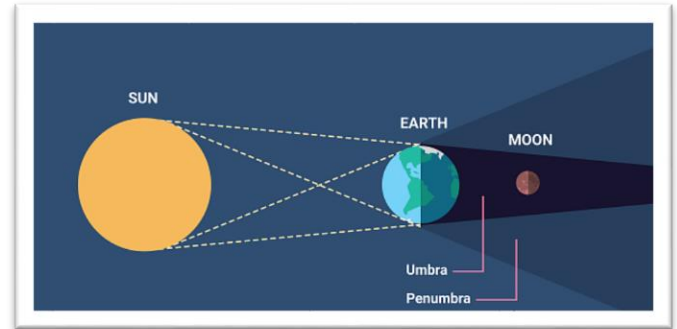
Objectives: Students will insha'Allah be able to:

- Understand Lunar Eclipse.
- Know types of lunar eclipse.

Teacher's Resource:

- Quiz questions
- Laptop (Power point presentation)
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given



Islamic Integration:

When to instill it:

Instructional Stages:

Warmup Activity:

Teacher will revise the previous lecture to create a link.

Our beloved Prophet Muhammad (ﷺ) told us that we should offer two rakah of salah, remember Allah (ﷻ) and give charity whenever a solar or a lunar eclipse occurs.

The special salah offered at the time of an eclipse is called Salat-ul-Khusouf.
[interpreted from Bukhari]

Direct Instructions: Teacher will discuss about:

- Lunar Eclipse
- Types of Lunar Eclipse

Students will also watch this clip to have a better understanding.

<https://www.youtube.com/watch?app=desktop&v=VW2xRR75IKE>

<https://youtu.be/bcrIGzQ1Ur4>

Guided and Independent Practice:

Teacher will conduct a short quiz.

Class Work: Do Q1 of STOP AND ASK YOURSELF on book page number 99 in your notebook.

Homework Assignment: Do 2 of STOP AND ASK YOURSELF on book page number 99 in your notebook.

Vocabulary

eclipse

partial eclipse

total eclipse

satellite

artificial satellite

Lesson 04: The Lunar and Solar Eclipse

The Solar Eclipse | Types of Solar Eclipse

Estimated Time Required: 40 minutes

Objectives: Students will insha'Allah be able to:

- Understand Solar Eclipse.
- Know types of solar eclipse.

Teacher's resource:

- A large ball with teacher
- Small balls with each student
- Laptop (Power point presentation)
- Soft board display
- Explore Your World - Science Book IV

Soft board Display: Image given

Islamic Integration:

When to instill it:

Our beloved Prophet Muhammad (ﷺ) told us that we should offer two rakah of salah, remember Allah (ﷻ) and give charity whenever a solar or a lunar eclipse occurs.

The special salah offered at the time of an eclipse is called Salat-ul-Khusouf.
[interpreted from Bukhari]

Instructional Stages:

Warm up Activity: Teacher will start by asking how big are the sun, the earth and the moon. She can also ask:

- Have you seen solar eclipse?
- When you last saw the solar eclipse?

Direct Instructions: Teacher will discuss about Solar Eclipse and Types of Solar Eclipse and students will watch this clip too: <https://www.youtube.com/watch?v=cK7zieTA5Sk>

Guided and Independent Practice:

1. How such a big heavenly body can hide behind a smaller body? Teacher will conduct a small activity to show this:

She will hold a large ball in her hand and will ask students to eclipse it with the smaller balls in their hands. They will try and adjust it and might need to close one eye.

2. After that students will watch a video for better understanding the topic: <https://youtu.be/Jejjy-LitcM>

Class Work: Do Ex VII and VIII in your book.

Homework Assignment: Do Q3 and Q4 of STOP AND ASK YOURSELF in the notebook.

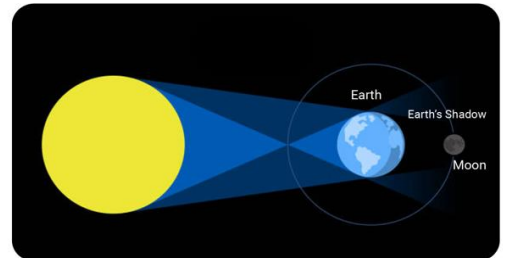
My Celestial Body Booklet

Select a celestial body and collect information about it from the library or internet. Make a booklet about it.

STOP AND ASK YOURSELF

1. How does a lunar eclipse occur?

Ans. When the light coming from sun is blocked by earth and moon appears dark, it is called a “Lunar eclipse”.



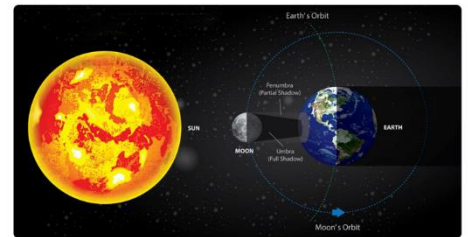
2. Draw a neat and labelled diagram of a lunar eclipse.

Ans.

3. How does a solar eclipse occur?

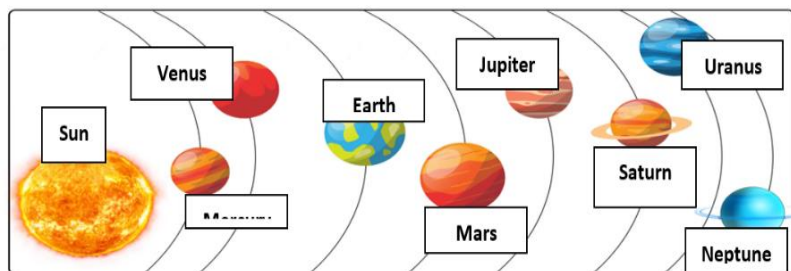
Ans. A solar eclipse is an astronomical event that occurs when the Moon comes in between the Earth and the Sun in such a way that it blocks the light of the Sun from reaching the Earth.

4. Draw a neat and labelled diagram of a solar eclipse.



Exercise

I. Label the following diagram of the solar system.



II. Name the planets that are gas giants.

Ans. The planets that are gas giants are: Jupiter, Saturn, Uranus and Neptune.

III. Name the terrestrial planets.

Ans. The terrestrial planets are: Mercury, Venus, Earth and Mars.

IV. Fill in the following blanks.

- Most asteroids are present between Mars and Jupiter.

- Planets go around the Sun and moon go around the planets.
- The planet with a ring around it is called Saturn.
- The hottest planet is Jupiter.
- The earth's closest neighbors are mars and venus.
- The planet that takes the shortest time to revolve around the sun is mercury.
- Earth, the third planet from the sun, rotates on its axis in about 24 hours and revolves around the sun in 365 days.

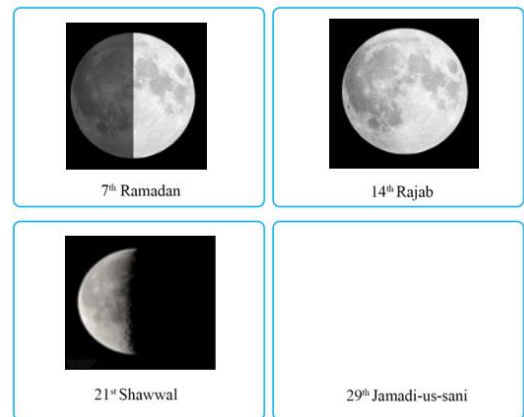
V. Define the Lunar cycle. Draw its diagram.

It takes the moon twenty-nine and a half days to complete its journey around the earth. These twenty-nine and a half days make up a lunar cycle or a lunar month. During a lunar cycle the moon takes different shapes that we see in the sky.

VI. Draw a figure to show what would the moon look like on the following dates.

VII. True or false and correct the false ones.

1. When there is day in Pakistan, there is night in America. (T)
2. At winter time all the countries have winter season. (F)
3. The earth rotates from west to east that is why the sunrises from the east. (T)
4. Earth is the only planet with a moon. (F)
5. A day at mercury is longer than the year. (T)



VIII. When does the Earth come between the Sun and the Moon? When does the Moon come between the Earth and the Sun?

Ans. The Earth comes between the sun and the moon in Lunar Eclipse.