

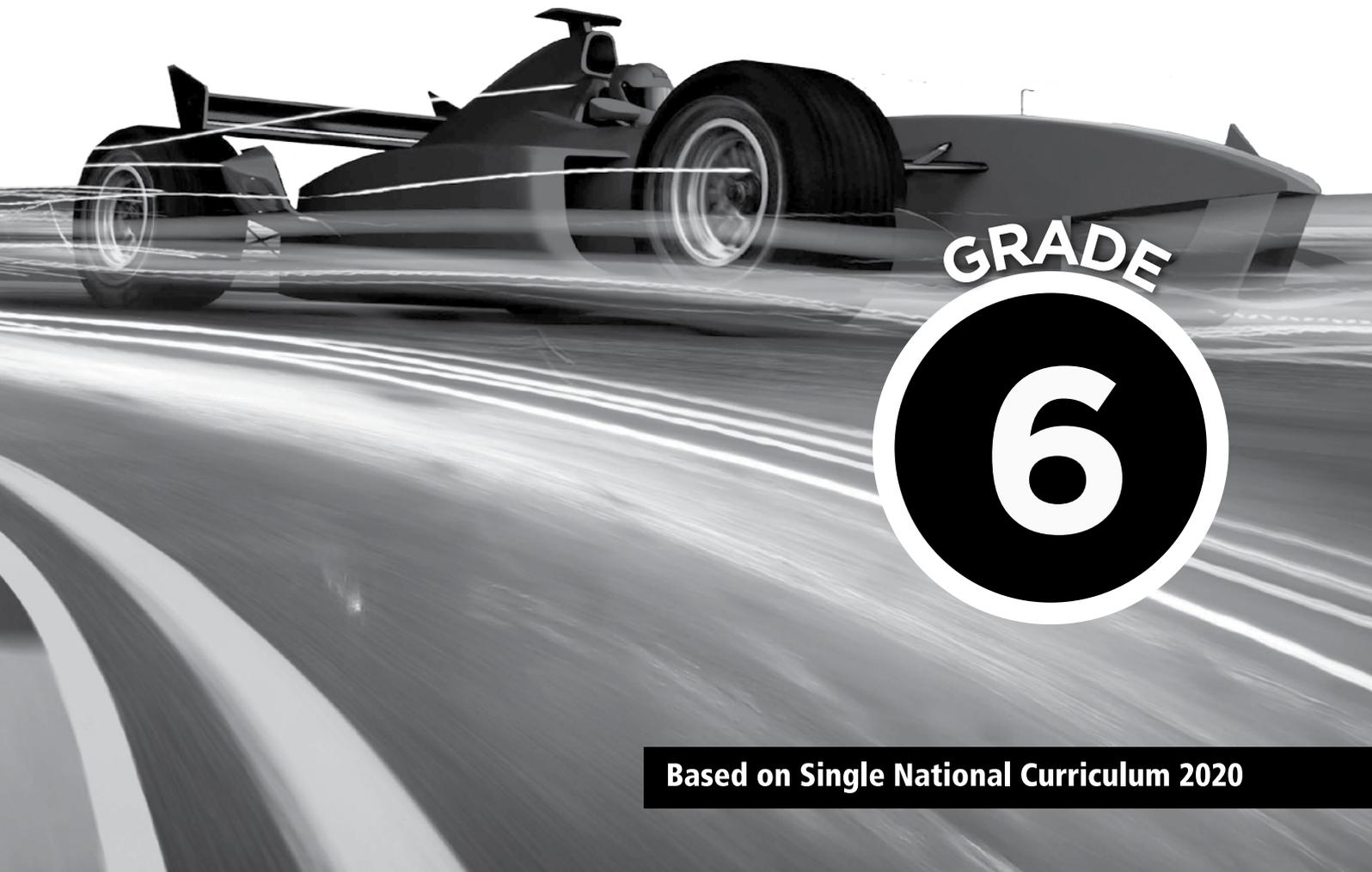
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**NEW**  
**Amazing**  
Science

**TEACHING GUIDE**

SHAHEENA IMRAN



GRADE

**6**

Based on Single National Curriculum 2020

**OXFORD**  
UNIVERSITY PRESS

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# Introduction

New Amazing Science Teaching Guide is a vital resource for science teachers in class to help deliver knowledge, problem-solving and thus reach academic objectives.

## Key Terms

### Starter Activity:

These help in bringing focus to the lesson and set the tone for learning.

### Lesson Methodology:

It suggests the method to cover the learning objectives for having a complete teaching and learning experience.

### PMI Chart:

It is a type of graphic organizer in which student examines pluses, minuses and interesting factors of the lesson.

Plus – Advantages

Minus – Disadvantages

Interesting -Implications

It is filled using ticks or cross

### PLUS MINUS INTERESTING

PLUS	MINUS	INTERESTING
X	-	x
-	X	x

### Home Learning:

For revision and reinforcement of the topic learned for strengthening knowledge of students.

Worksheets present at the end of the lessons.

*Remember to use Mind Tree and STEM at the end of every unit.*

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### SUBTOPICS

- Recognize cells as the basic unit of life that are organized into tissues, organs, systems and organisms.
- Arrange and rank different levels of cellular Organisations – cells to tissues, organs and organisms.
- Relate the structures of some common cells (nerve, muscle, epithelium and blood cells) to their functions.
- Identify the structures present in an animal cell and plant cell as seen under a simple microscope and relate them to their functions (only cell membrane, cytoplasm, nucleus, cell wall, chloroplast, mitochondria and sap vacuole).
- Describe the similarities and differences between the structures of plant and animal cells. Sketch the animal and plant cells and label key organelles in each.
- Compare and contrast an animal cell and plant cell by preparing slides using onion peels and cheek cells.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 1

**Topic:** Cellular Organisation

### Subtopics:

- The basic unit of living things
- How do we see cells
- Prepare leaf slide for observing under microscope
- Preparing a cheek slide.
- Inside the cells
- Parts in an animal cell
- Cytoplasm, cell membrane, nucleus, vacuoles, mitochondria, ribosome
- Parts in a plant cell
- Cytoplasm, nucleus, cell membrane, nucleus, vacuoles, mitochondria, cell wall, chloroplasts, ribosome

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To enable students to understand cell as a basic unit of living thing and how to look at structure of cells.
- To enable students to understand and recognize animal and plant cells and its parts

### Learning Outcomes:

- Recognize cells as basic unit of life that are organized into tissues, organs, systems, and organisms.
- Identify the structure present in an animal cell and plant cell as seen under a light microscope and relate them to their functions (only cell membrane, cytoplasm, nucleus, cell wall chloroplast, mitochondria and sap vacuole).
- Describe the similarities and differences between the structures of plant cell and animal cell. Sketch the animal cell and plant cell and label key organelles in each.
- Compare and contrast an animal cell and plant cell by preparing slides using onion peels and cheek cells.

### Resources:

- Textbook (NAS Book 6)

## Teacher Ideas

- Light microscope, slides and required material for preparation of slides
- Charts
- Two sets of cards with diagrams of either animal cell or plant cell

### **Starter Activity (5 min)**

Distribute the cards amongst the students and ask them to identify type of cell and label three main parts.

Write key words on the board.

### **Lesson Methodology (30 min)**

- As soon as the lesson starts, ask students to open their books to assigned page numbers and read silently. Teacher will facilitate. Next loud reading will be done by the teacher.
- Lesson will be explained by using charts effectively.
- At the end quick analysis will be done.
- Students will be taken to the laboratories. Slides of cheek cells and onion peel will be prepared and shown. Ask students to identify cell membrane, nucleus and vacuole.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

- Ask students to make Venn diagram to show similarities and differences in the animal and plant cells (page number 4). Attempt quick review on page 10 in the notebook.

### **Home learning**

To study the topic for revision.

### **Lesson Evaluation**

Ask some questions randomly for evaluation.

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 1

**Topic:** Cellular Organisation

**Subtopic:**

- Unicellular Organisation

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objectives:**

- Unicellular and multicellular Organisms
- Cells work in teams, the cellular Hierarchy
- From cells to tissues
- From tissues to organs
- Plant Organs
- From organs to systems
- Vegetable parts
- Reproductive parts
- Root System

**Learning Outcomes:**

- Arrange and rank different levels of cellular organisations—cells to tissues, organs, systems and organisms.
- Relate the structure of some common cells (nerve, muscle, epithelium and blood cells) to their function.
- To study about some commonly found unicellular organisms and their functions.

**Resources:**

- Textbook (NAS Book 6)
- Charts
- Light Microscope, slides of Amoeba, Paramecium

**Starter Activity (5 min)**

Students will be shown slides of Amoeba and Paramecium under the light microscope. Ask them to share their observations on structure of the microscopic unicellular organisms.

**Lesson Methodology (30 min)**

- Write key words on the board.

**Teacher Ideas**

- Ask students to open their books to assigned page numbers and read silently. Teacher will take round and facilitate. Next loud reading will be done by the teacher.
- At the end quick analysis will be done by the teacher.

**Plenary (5 min)**

Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

- Quick Review on page 5 will be done.
- Some relevant questions from Unit Review will be done.

**Home learning**

Students will be asked to study the topic for better comprehension.

**Lesson Evaluation**

Ask students to name some specialised animal and plant cells.

**Further Notes**

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## Lesson Plan 3

**Class:** 6

**Subject:** General Science

**Unit:** 1

**Topic:** Cellular Organisation

### Subtopics:

- Human Body System
- Skeletal System
- Digestive System
- Respiratory System
- Excretory System
- Circulatory System
- The Hierarchy of Life

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

To enable students to fully understand human body system, how it works and what it is comprised of.

To comprehend hierarchy of life in humans and plants

### Learning Outcomes:

- To enable students to describe working of human body comprising of various systems working together so that human (animal) body can perform vital activities.
- To explain hierarchy of life with simple examples from animal (human) and plant kingdom.

### Resources:

- Textbook (NAS Book 6)
- Poster—Hierarchy of life
- Charts—various systems in human body

### Starter Activity (5 min)

Write the following definitions on board with answers to be unscrambled.

- a. All bones, including the spine and ribs comprise this system.

LELATSKE (SKELETAL)

- b. Mouth, stomach, small and large intestines, rectum and anus make up this system.

## Teacher Ideas

STIVEDIGE (DIGESTIVE)

c. Lungs, windpipe and diaphragm are part of this process.

IIRARESPTON (RESPIRATION)

d. This system controls the body fluids.

TORYCREEX (EXCRETORY)

e. This system is responsible for carrying oxygen and nutrients.

LAUCCIRORYT (CIRCULATORY)

### Lesson Methodology (30 min)

- As students engage through starter activity, they will be asked to open their books to assigned page numbers and read silently. Teacher will take rounds and facilitate. Next loud reading will be done by the teacher.
- Explanation of the subtopics will be done. The diagrams of human body system will be referred to by the teacher.
- At the end quick analysis will be done.

### Plenary (5 min)

- Quick PMI chart (Plus, minus, interesting) will be filled.

### Assessment Opportunities (30 min)

Ask students to do Quick Review on page 11 and Unit Review

### Home learning

Ask students to read the topic for revision.

### Lesson Evaluation

Ask few students to briefly talk about hierarchy of life.

### Further Notes

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## Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. How can you prepare slide from onion peels? Write steps.

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Q2. State whether true or false.

- a. Cells are simple structures \_\_\_\_\_
- b. Organelles are part of cells with a special function \_\_\_\_\_
- c. Chloroplast controls the entry and exit of substances in a plant cell \_\_\_\_\_.
- d. Mitochondria are powerhouses of cells \_\_\_\_\_.
- e. Cell wall is the thick layer around the animal and plant cell \_\_\_\_\_.

## Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Draw the structures of the following specialised cell.

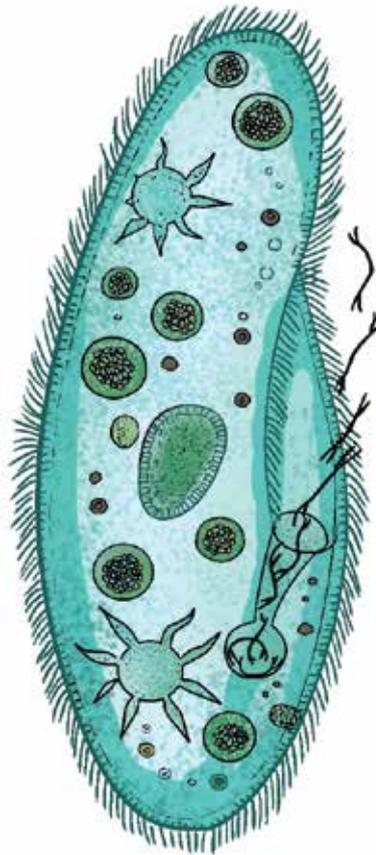
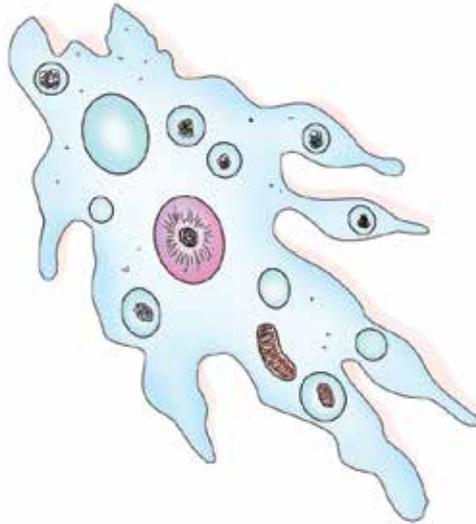
- Motor Nerve Cell

- Red Blood Cell

- Phloem

- Root hair Cell

Q2. Name the uni-cellular organisms shown below:



### Worksheet # 3

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following line to show hierarchy in life.

CELLS \_\_\_\_\_

Q2.i. Name any five systems in human body:

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

d. \_\_\_\_\_

ii. Define any two of the above mentioned systems.

## Answer key Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1.

1. Take a very thin slice of onion peel.
2. Put few drops of dye on the slide (methylene blue), for staining. This makes it easily visible.
3. A coverslip is placed on the top of the specimen to keep it in one place.
4. Slide is now ready for observation under microscope.

Q2.

a.	False
b.	True
c.	False
d.	True
e.	False

## Answer key Worksheet # 2

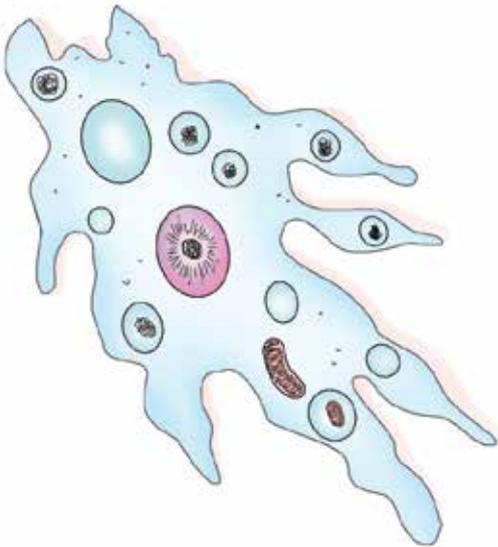
Name: \_\_\_\_\_

Date: \_\_\_\_\_

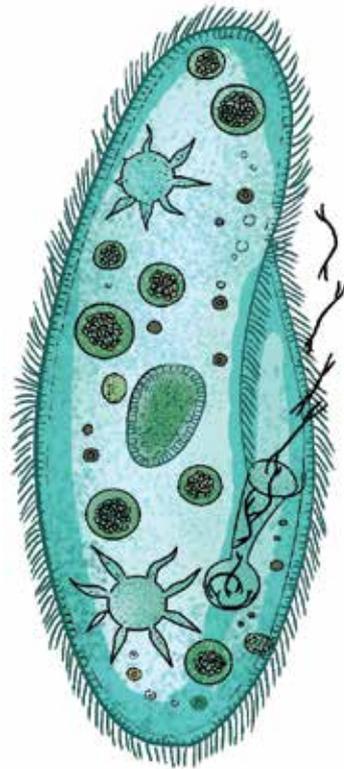
Q1. Draw the structures of the following specialised cell.

- Motor Nerve Cell
- Red Blood Cell
- Phloem
- Root hair Cell

Q2. Name the uni-cellular organisms shown below:



Amoeba



Paramecium

### Answer key Worksheet # 3

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. CELL → TISSUE → ORGAN → ORGAN SYSTEM → ORGANISM

Q2. i.

- a. Skeletal System
- b. Digestive System
- c. Respiratory System
- d. Excretory System
- e. Circulatory System

ii. (Any two) For example

Respiratory System includes lungs, windpipe, and diaphragm. Lungs take in oxygen and transfer it to blood to be supplied to the whole body and then remove carbon dioxide from cells and exhale it out of the body.

Circulatory System Heart and blood vessels carry oxygen and nutrients to cells and waste material away from cells via blood.

## Answer key

### NAS book 6

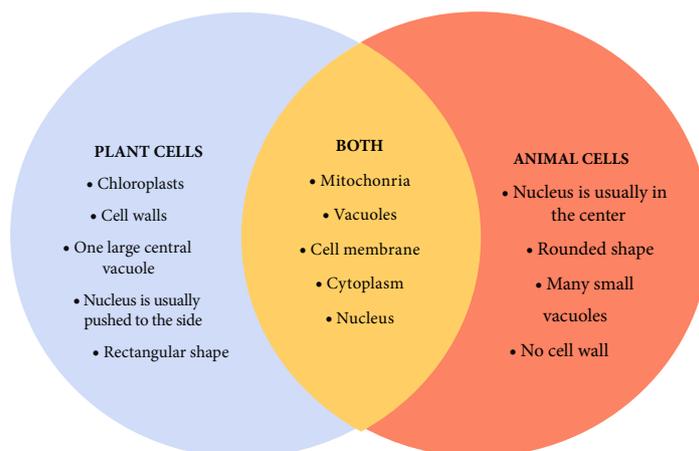
### Unit 1

### Quick Review

#### Page 5

STRUCTURE	LIVER CELL	PALISADE CELL
Cell surface membrane	✓	✓
Chloroplasts		✓
Cellulose cell walls		✓
Nucleus	✓	✓

#### Page 10



#### Page 11

Make food in plants	STOMACH
Consists of muscle tissues and connective tissues.	LEAF
It has a shape like shoe	TISSUES
A group of similar cells specialized to do a similar task.	PARAMECIUM

### Unit Review

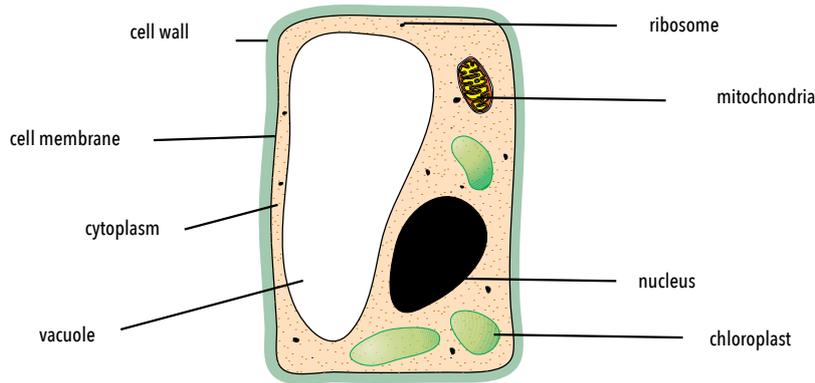
#### Circle the correct answer.

1.	d. Systems
2.	a. stomach
3.	b. an organ
4.	c. flower
5.	c. cell wall

## Vocabulary Review

1.	Cytoplasm
2.	Mitochondria
3.	Fluid, waste material

## Observe and Answer



## Recall and Response

1.	Cytoplasm	Cell membrane	Nucleus	
2.	Euglena	Amoeba	Chlamydomonas	
3.	Nucleus			
4.	Red blood cell	Muscle cell	Motor nerve cell	
5.	a.	Root hair cell	Red blood cell	Motor nerve cell
	b.	Connective tissue	Blood	Skeletal tissue
	c.	Brain	Heart	Stomach
	d.	Digestive system	Circulatory System	Nervous System

## RECALL AND ANALYSE

1.

a. Digestive

It breaks down food into simpler substances through alimentary canal.

b. Circulatory

Heart pumps and blood vessels carry oxygen and nutrients to cells and waste material away from the cells via blood.

c. Respiratory

It takes in oxygen and transfer it to blood, removes carbon dioxide and brings it back to the lungs.

2. Tissue is a group of similar cells which perform similar functions.

4. Xylem transports water and minerals, and phloem transports minerals in plants.

5. The nervous system helps us sense our location.

## RECALL AND APPLY

1. Cell is the basic unit of life. Tissues are made up of group of similar cells. Organs are formed by group of different tissues working together.
2. Cells get the energy from the mitochondria which is called the power house of the cell.
3. Chloroplasts contain green pigment called chlorophyll which absorbs light energy to make food during the process of photosynthesis which only happens in plants.
4. The cell wall is only present in plants because it provides rigidity and support to plants which is required by the plants.

### SUBTOPICS

- Describe the different types of reproduction of plants.
- Distinguish between artificial and natural asexual reproduction in plants (Budding, grafting, Bulbs, Tuber, Runners, cutting, and layering).
- Compare and contrast types of reproduction (sexual and asexual) in plants.
- Inquire how artificial propagation can lead to better quality yield in agriculture.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 2

**Topic:** Reproduction in plants

### Subtopics:

- Reproduction
- Reproduction in plants
- Asexual Reproduction
- Sexual Reproduction
- Sexual Reproduction in plants
- Life cycle of a flowering Plant
- Dispersion of seeds

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To explain the process of reproduction in plants and animals and its purpose.
- To give knowledge of as to how plants and animals increase in number and continue their line.

### Learning Outcomes:

- Describe the different types of reproduction in plants.
- Compare and contrast types of reproduction (sexual and asexual).

### Resources:

- Textbook (NAS Book 6)
- Charts of life cycle of a flowering plant
- Pollination
- Videos on Dispersal of seeds from internet

### Starter Activity (5 min)

- Arrange a variety of seasonal flowers.
- Write key words on the board.
- Ask students to come close to the display table in groups.
- With magnifying glasses show them internal structure of flower, especially reproductive parts.
- Ask students about purpose of these parts.

## Teacher Ideas

### **Lesson Methodology (25 min)**

- As the students engage in class ask them to open their books to assigned page numbers and read silently. Teacher will take round and facilitate. Next teacher will read the lesson loudly. Explanation of the lesson will follow. The relevant charts will be used effectively and some drawings could be made on the board too.
- Quick analysis will follow.
- A video on pollination and dispersion of seed will be shown.

### **Plenary (5 min)**

Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (5 min)**

- Ask students to do Quick Review given on page no. 19.
- Next, they will attempt some relevant questions of Unit Review.

### **Home learning**

Ask students to read the topic for revision.

Ask them to search information on Internet on plant reproduction of grade 6 level and make notes.

### **Lesson Evaluation**

Ask students to attempt worksheet no. 1

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 2

**Topic:** Reproduction in Plants

**Subtopics:**

- Asexual Reproduction
- Natural Vegetative Reproduction

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objectives:**

- To discuss the topic and its various methods
- To effectively utilize materials given in the book through diagrams and images.

**Learning Outcomes:**

- Distinguish between artificial and natural asexual reproduction in plants (budding, grafting, bulbs, tubers, runners, cutting and layering).
- Inquire how vegetative propagation can lead to better quality yield in agriculture.

**Resources:**

- Textbook (NAS Book 6)
- School Garden/nearest nursery
- Charts

**Starter Activity (15 min)**

Arrange a trip to school garden. The gardener will prepare and show various methods e.g., cutting, grafting. Explain the procedure as it is being done. Let students ask couple of questions or queries for the gardener to answer.

**Lesson Methodology (20 min)**

- After starter activity ask students to open their books and do silent reading. Teacher will facilitate.
- Teacher will then do loud reading.
- Explanation will follow.
- A quick analysis of the lesson will be done at the end, briefly.

## Teacher Ideas



## Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following statement using words from the box below.

reproduction asexual style sexual genes sticky pollination

1. \_\_\_\_\_ is the essential part of life cycle of plant.
2. \_\_\_\_\_ produces genetically identical plants.
3. In \_\_\_\_\_ reproduction, offspring receives half \_\_\_\_\_ from each parent.
4. Stigma has \_\_\_\_\_ surface for pollen grains to attach to \_\_\_\_\_.
5. \_\_\_\_\_ is the process of transfer of pollen grains.

Q2. Match to the correct statement.

Dandelion	<del>_____</del>	<del>_____</del>	Take away
Acorn	<del>_____</del>	<del>_____</del>	Seed dispersal as parachute
Himalayan balsam	_____	_____	Winged seeds
Sycamore	_____	_____	Explodes
Blackberries	_____	_____	Juicy Fruits

## Answer key Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1.

1.	Reproduction
2.	asexual
3.	sexual
	genes
4.	sticky
	Style
5.	Pollination

Q2.

Dandelion	Take away
Acorn	Seed dispersal as parachute
Himalayan balsam	Winged seeds
Sycamore	Explodes
Blackberries	Juicy Fruits

## Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Fill the table below.

	Advantage	Disadvantage
<b>Asexual Reproduction</b>		
<b>Sexual Reproduction</b>		

Q2. Many plants reproduce from stems. Name the 4 types, and briefly write about it.

- i. \_\_\_\_\_  
\_\_\_\_\_
- ii. \_\_\_\_\_  
\_\_\_\_\_
- iii. \_\_\_\_\_  
\_\_\_\_\_
- iv. \_\_\_\_\_  
\_\_\_\_\_

## Answer key Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Fill the table below.

	<b>Advantage</b>	<b>Disadvantage</b>
<b>Asexual Reproduction</b>	Only one parent needed	Fertilisation is random so harmful variation may occur
<b>Sexual Reproduction</b>	Variation, so new features of organisms may allow adaptation to new environment	Two parents needed

Q2. Many plants reproduce from stems. Name the 4 types, and briefly write about it.

- i. Tubers: Are swollen underground stems which contain stored food. Green shoots grow from eyes or buds to form new plants.
- ii. Runners: Some plants have stems which grow horizontally over the soil. They have buds which grow into new plants.
- iii. Bulbs: They are modified stems wrapped in leaves. The buds grow from the stem to form new shoots.
- iv. Corm: They are short, thick, underground stem.

## Answer key

### NAS book 6

#### Unit 2

#### QUICK REVIEW

##### Page 19

The male reproductive parts of flower are called the **stamen**. Each is made up of an **anther** and a filament. The grains are made inside the **anther**. The female reproductive parts of a flower are called **carpels**. Each is made up of a **stigma**, style and **ovary**.

##### Page 24

1.	True
2.	True
3.	False

#### Unit Review

#### CIRCLE THE CORRECT ANSWER

1.	d. both a and b
2.	a. pollination
3.	d. both a and b
4.	c. stamen and stigma hang outside
5.	d. both b and c

#### VOCABULARY REVIEW

1. Corms
2. The General Sherman Tree
3. Tubers

#### OBSERVE AND ANSWER

1. The row A shows correct labelling.
2.
  - a. i, iv, iii, ii

#### RECALL AND ANALYSE

1. a. The nucleus from the pollen grain travels down a pollen tube to combine with the nucleus of an egg cell, inside an ovule within an ovary at the base of a flower. Fusion of male and female reproductive cells occur, known as fertilisation and a zygote is produced.  
b. When pollen grain reaches the stigma of the female flower, it produces a pollen tube. The nucleus from a pollen tube to combine with the egg cell and fertilisation takes place.  
c. Petals: Wither away after fertilisation.  
Ovules: After fertilisation the zygote develops in ovules, which is then converted into seeds.  
Ovary: The wall of the ovary changes. It may become hard and dry or fleshy or succulent. The ovary is now called a fruit.

2.

Fruit	Seed	Neither seed nor fruit
Tomato Cucumber Grapes	Pea Runner Beans Baked Beans (Cooked Beans)	Brussels Sprout Celery

3. Pollination is travel of pollen grains from male to female flower, whereas fertilisation is the process of fusion of gametes

## RECALL AND RESPONSE

1a.

Plant	Part of the plant involved in reproduction
A	Buds grow from stems/ tubers.
B	Piece of stem called sets or cutting of the plant contain at least one node.
C	Division of suckers which grow from the base of the banana stem from the underground banana corm.
D	(Crocus) It reproduces by corms.

1b.

1. It can occur in various environments.
2. A higher number of plants produced.

## RECALL AND APPLY

1. Diagram shows the longitudinal section of flower

- (i) P = ovary Q=anther
- (ii) Ovary
- (iii) Insect pollinated flowers produce nectar to attract insects.
- (iv) Bees visit mango plant to collect nectar. They pollinate flowers while collecting it. Therefore, they help in reproduction.

2.

a. P =Anther Q =Petal R =Sepal

b. Anila intends to pollinate plant A with plants B and C. She collected the pollen grains from plant A transferred them onto plants B and C.

- (i) Anther
- (ii) Pollination
- (iii) Pollen grains will help in fertilisation.
- (iv) Fruits form when fertilisation takes place, which is possible in same kind of flowers. Therefore plant B produced fruit.
- (v) Rose plant has both male and female parts. Therefore, self-pollination takes place. Thus, their pollen grains are not visible.

### SUBTOPICS

- Identify the constituents of a balanced diet for humans as including protein, carbohydrates, fats and oils, water, minerals (limited to calcium and iron) and vitamins (limited to A, C and D), and describe the functions of these nutrients.
- Identify the essential nutrients, their chemical composition, and food sources.
- Identify and describe essential nutrients' deficiency disorders.
- Recognize that a healthy diet contains a balance of foodstuffs.
- Correlate diet and fitness.
- Briefly describe some major digestive disorders.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 3

**Topic:** Balanced Diet

### Subtopics:

- Introduction
- Food types
- Carbohydrates
- Fats
- Minerals
- Water

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To give clear concept of the topic in detail
- To enable students to realise what are important nutrients in a balanced diet.

### Learning Outcomes:

- Identify the constituents of a balanced diet for humans including proteins, carbohydrates, fats and oils, water, minerals (limited to calcium and iron) and vitamins (limited to A, C and D), and describe the functions of these nutrients
- Identify the essential nutrients, their chemical composition, and food sources

### Resources:

- Textbook (NAS Book 6)
- Charts—Balanced diet pyramid (page# 33)
- Packets of a variety of food types

### Starter Activity (5 min)

- Ask students to bring small packets of different food types (or arrange the packets for students)
- Display on the table prior to the class.
- Ask some questions; for example
  - Can you name some of the food types by looking at the table?
  - What is a balanced diet?
  - Do you eat some of the foods displayed here?

## Teacher Ideas



## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 3

**Topic:** Balanced Diet

### Subtopics:

- Healthy Eating
- Too much or too less energy
- Importance of an energy balance
- Malnutrition

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To emphasize upon the basis of healthy eating and its benefits.
- To highlight the importance of good health and how malnutrition is bad for health.

### Learning Outcomes:

- Identify and describe essential nutrients deficiency disorders.
- Recognize that a healthy diet contains a balance of food stuffs.
- Correlate diet and fitness
- Briefly describe some major digestive disorders

### Resources:

- Textbook (NAS Book 6)
- Chart-- book page # 31— images of food types

### Starter Activity (5 min)

Ask students to look at the chart of food types and then throw few relevant questions:

- What are the food types in each picture?
- Why we need to eat balanced diet as learnt in the previous lesson?
- What happens if people tend to eat more or less than what is required?
- Then write key words on the board.

### Lesson Methodology (30 min)

- As students engage, ask them to open the books to assigned pages and read silently.

## Teacher Ideas



## Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Look at the picture and name the food types:



Q2. Fill in the blanks.

1. Our bodies are 70% \_\_\_\_\_.
2. \_\_\_\_\_ have 2.5 times more energy than carbohydrates.
3. Amino acids are basic building blocks of \_\_\_\_\_.

## Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Give examples of the following diet:

- a. Carbohydrates \_\_\_\_\_
- b. Vegetables and fruits \_\_\_\_\_
- c. Dairy products, meat and fish \_\_\_\_\_
- d. Sweets, fats and oils \_\_\_\_\_

Q2. Write a brief note to explain why some food are bad for your health

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Carbohydrates

## Answer-key Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Look at the picture and the food types:



Protein



Carbohydrates



Vitamins and minerals



Fats and oil

Q2. Fill in the blanks.

1. Our bodies are 70% water.
2. Fats and Oils have 2.5 times more energy than carbohydrates.
3. Amino acids are basic building blocks of life.

## Answer-key Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Give examples of the following diet:

- a. Carbohydrates **roti, rice, bread**

- b. Vegetables and fruits potato, spinach, apple, orange
- c. Dairy products meat fish, cheese, salmon, prawns, yogurt
- d. Sweets, fats and oils olive oil, mustard oil

Q2. Write a brief note to explain why some foods are bad for your health.

Certain foods are considered bad for our health due to reasons such as poor nutritional profiles, high levels of added sugars, unhealthy fats, and potential adverse health effects. These foods may lack essential nutrients, be high in calories, contribute to weight gain, increase the risk of chronic diseases like diabetes and heart disease, and negatively impact dental health. Being mindful of these factors can help you make healthier food choices and maintain better overall health.

**Quick Review Page # 34**

- a. Proteins
- b. Fats
- c. Minerals and vitamins

**Unit Review**

**Circle the Correct Answer**

1.	a. vegetable
2.	a. vitamin D
3.	b. amino acids
4.	a. haemoglobin
5.	d. vitamin D

**Vocabulary Review**

1.	Carbohydrates
2.	Malnutrition
3.	Fibre
4.	Proteins

**Observe and Answer**

- a. 8400 KJ
- b. For a woman office worker 904.7 grams and for a man office worker 1000 grams of food 3 are required to meet the energy needs.
- c. Energy needs of labourer = 18,980 KJ  
 Energy needs of male office worker = 10,500 KJ  
 Difference in energy needs is

18,900-10,500 =8400 KJ

The labourer needs 8400 KJ more than an office worker.

d. i. Food 1, would be a better choice since it provides maximum energy per 100 gm of food in comparison to other foods so the labourer can eat less but still gets more energy.

ii. Energy requirement of labourer =18,900 KJ

Energy provided by Food 1 = 3800 KJ/100 g

So 1 g provides 38 KJ of energy.

Intake required to fulfill energy needs=18900/38=497.368 g.

Therefore, 498 grams of food is required by the labourer to fulfill their energy needs.

### Recall and Response

Nutrient	Food containing a lot of this
protein	
carbohydrate	
minerals and vitamins	
fibre	

1.

a.	✓
b.	✓
c.	x
d.	✓

2. i. Papaya, Walnut

ii. Rickets, Anemia

iii. Chickenpox, Measles

3. Four things essential for remaining healthy are:

i. Proteins

ii. Carbohydrates

iii. Fats

iv. Minerals

### Recall and Analyse

1.

Column A = deficiency of vitamin C

Column B = deficiency of Calcium

Column C = deficiency of vitamin D

Column D = deficiency of iron

2.a. A balanced diet must include:

- Cereals (roti, rice, bread, pasta, etc.). This should make up the major part of balanced diet).
- Vegetables and fruits should form the second tier.
- Dairy products, meat and fish should be eaten in smaller quantities.
- Sweets, fats and oils should be consumed in very small quantities.

b. A growing child should have an increased quantities from various food groups, like proteins, vitamins and minerals as they require extra energy for growth.

c. The three components are carbohydrates, proteins and vitamins . Carbohydrates provides us with energy, proteins help in growth and repair. Vitamins help in keeping us well.

3. Carbohydrates are rich source of energy which is continuously required by the body for various vital activities. Therefore, it is important to have carbohydrate rich foods.

4.

- Roughage or fibre is the bran of the cereal, the cell wall of the plant cells, which passes unchanged through gut.
- It helps avoid obesity by adding indigestible matter to food. This satisfies your appetite for food but cannot make you fat.
- It absorbs poisonous waste from food that is being digested in the gut.

### Recall and Apply

1. (Answers may vary according to cereal label taken as reference)

<b>Cheerios</b>			
<b>Nutrition Facts:</b>			
Serving Size 1 cup (28g)			
Children under 4 – ¾ cup (21g)			
Servings Per Container about 14			
Children under 4 – about 19			
Amount Per Serving	cheerios	with % cup skim milk	Cereal for children under
<b>Calories</b>	100	150	80g
Calories from fat	15	20	10g
<b>Total Fat 2g</b>	<b>% Daily Value**</b>		
Saturated Fat 0.5 g	<b>3%</b>	<b>3%</b>	1.5g
Trans Fat 0g	<b>3%</b>	<b>3%</b>	0g
Polyunsaturated Fat 0.5 g			0g
Monounsaturated Fat 0.5g			0.5g
<b>Cholesterol 0mg</b>	<b>0%</b>	<b>1%</b>	0.5g
<b>Sodium 140mg</b>	<b>6%</b>	<b>8%</b>	105mg
<b>Potassium 180 mg</b>	<b>5%</b>	<b>11%</b>	135mg
<b>Total Carbohydrate 20g</b>	<b>7%</b>	<b>9%</b>	15g
Dietary Fiber 3g	<b>11%</b>	<b>11%</b>	2g
Soluble Fiber 1g			0
Sugars 1g			10g

a. Carbohydrates, proteins, and fats provides energy which are components of breakfast cereal.

b. In 100 g of breakfast cereal, there are :

- Polyunsaturated fat = 0.5 g
- Monounsaturated fat = 0.5 g
- Total fat content = 1.0 g

c. Protein = 2 g

Carbohydrate = 200 g (sugars = 1 g)

Fibre = 4 g

Sodium = 140 mg = 0.14 g

Total = 26.14 g

d. and e. The answer should be based on the label chosen.

**It is suggested that teacher may choose a local label and work around it.**

2. i. Ali's breakfast consists of proteins (eggs), carbohydrate (bread), fat (butter).

ii. Fruits and vegetables are lacking in Ali's food which contain minerals, vitamins and fibre.

3. i. When a few drops of Iodine solution are added in bread, the colour will change to blue-black, which indicates presence of starch in bread slice.

ii. Labourer require excessive amount of energy due to extreme physical activity for long hours. Therefore fats are more suitable as fats contain higher amount of calories.

4.

COMPONENTS	SOURCES
Carbohydrates	bread, cereal, pasta
Proteins	meat, fish, eggs
Fat	butter, oil
Vitamins	fruits (juices)
Minerals	multivitamin in tablets, nuts
Water	natural river water, wells

### SUBTOPICS

- State the importance of digestion in the human body and describe physical and chemical digestion.
- Sequence the main regions of Alimentary Canal, its associated organs, and describe the functions of different parts of the Alimentary Canal.
- Briefly describe the role of enzymes in digestion.
- Conclude that blood transports the products of digestion to other parts of the body and the undigested products get egested / defecated.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 4

**Topic:** Human Digestive System

### Subtopics:

- Energy from food
- Digestion
- The process of digestion-(Teeth)
- Absorption of digested food
- Role of enzymes in digestion

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To explain in detail the topic for students to comprehend.
- To elaborate role of enzymes in digestion.

### Learning Outcomes:

- State the importance of digestion in the human body and describe physical and chemical digestion.
- Sequence the main regions of the alimentary canal, its associated organs and describe the functions of different parts of the alimentary canal.
- Briefly describe the role of enzymes in digestion.
- Conclude that blood transports the products of digestion to other parts of the body and the undigested products get egested/defecated.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Computer with Internet access
- Pen, pencil and paper

### Starter Activity (10 min)

- Ask students some questions, for example:
  - What have you eaten in the breakfast?
  - Are you still thinking about the food you have eaten?
  - If the answer is 'no' say, do you know what is happening to the food you have eaten?

## Teacher Ideas



## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 4

**Topic:** Human Digestive System

**Subtopics:**

- Food and Health
- Disorders of the digestion
- Constipation
- Ulcers

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objectives:**

- To highlight the importance of good health, a result of healthy eating habits.
- To discuss the disorders that are a result of bad eating habits and mistakes in selection of food.

**Learning Outcomes:**

- To clarify importance of food as it relates to health.
- To gain knowledge of disorders of human body due to indigestion, diarrhea, constipation and ulcers.

**Resources:**

- Textbook (NAS Book 6)
- Worksheet for starter activity

### Teacher Ideas

### Starter Activity (10 min)

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

- ulcers
- stomach
- indigestion
- obesity
- laxatives
- constipation

### (Answer Key)

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

### **Lesson Methodology (30 min)**

- After the starter activity, ask students to open their books to assigned page number and read silently.
- Teacher will do loud reading.
- Explanation of the topic will be done.
- A quick analysis will follow. Students may ask if they have any queries and teacher will answer.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt Question Review followed by Unit Review.

### **Home learning**

- Students will read the topic of revision.
- Search for information on the topic at home on Internet and make notes.
- Write a comprehensive and brief report on 'eating disorders' .

### **Lesson Evaluation ( 5 min)**

- Ask students to attempt worksheet #2.

## Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following:

- a. \_\_\_\_\_ begins the process of breaking down food and makes food moist so it is easier to swallow.
- b. The \_\_\_\_\_ intestine is where digestion continues so nutrients can be absorbed into the body.
- c. The \_\_\_\_\_ intestine absorbs water from undigested food and forms waste into faeces.
- d. Liver produces \_\_\_\_\_ which helps the body absorb fats.

Q2. Name the different type of teeth with their functions:



## Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. List three ways to prevent constipation:

\_\_\_\_\_

2. List two possible causes of diarrhea.

\_\_\_\_\_

3. List three ways to avoid indigestion.

\_\_\_\_\_

4. What causes indigestion?

\_\_\_\_\_

5. What could be the result of indigestion?

\_\_\_\_\_

6. What causes ulcers?

\_\_\_\_\_

7. In severe cases of constipation what medicine is prescribed by the doctors ?

\_\_\_\_\_

## Answer key Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following:

- a. **Saliva** begins the process the process of breaking down food and makes food moist so it is easier to swallow.
- b. The **small** intestine is where digestion continues so nutrients can be absorbed into the body.
- c. The **large** intestine absorbs water from undigested food and forms waste into faeces.
- d. Liver produces **bile** which helps the body absorb fats.

Q2. Name the different type of teeth with their functions:



**Premolars**



**Canines**



**Molars**



**Incisors**

Incisors: Used for cutting and biting food

Canines: Used for tearing food

Premolars: Used for crushing food

Molars: Used for grinding food

## Answer key Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. List three ways to prevent constipation:

- Eating lots of fibre
- Regular exercise
- Drinking right amount of water

2. List two possible causes of diarrhea:

- Germs (bacteria, viruses)
- Irritable bowel syndrome

3. List three ways to avoid indigestion:

- Eat slowly
- Avoid fatty foods
- Do not overeat

4. What causes indigestion?

Indigestion can be caused if too much gastric juice is produced.

This can happen if a person does not eat food regularly or eats food too quickly.

5. What could be the result of indigestion?

Diarrhea is a result of indigestion.

6. What causes ulcers?

Ulcers are caused by production of too much acids and enzymes.

7. In severe cases what medicines are prescribed by the doctor?

Laxatives

## Answer key

### NAS book 6

### Unit 4

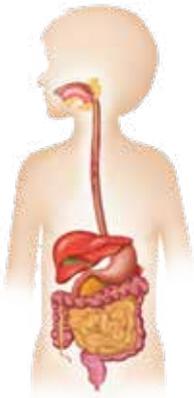
### QUICK REVIEW PAGE 42

- Incisors
- Molars
- Canines

### UNIT REVIEW

### CIRCLE THE CORRECT ANSWER

1. d. Vitamins
2. c. It helps breakdown fat into droplets
3. a. Duodenum
4. b. Small intestine
5. d. All of these



### OBSERVE AND ANSWER

Mouth

Stomach

Liver

Small Intestine

## VOCABULARY REVIEW

1.	faeces
2.	obesity
3.	lipase

## RECALL AND RESPONSE

1.
  - i. Amylase: These enzymes help in the digestion of carbohydrates.
  - ii. Proteases: These enzymes help in the digestion of protein
  - iii. Lipases: These enzymes help in the digestion of fats.
2. The process of digestion starts from the mouth, when we chew the food and swallow it. The flow of food particles begins in the mouth and ends in the anus.

Two other organs liver and pancreas, secrete substances that break down food that is eaten. The wave like motion of oesophagus moves the food along the alimentary canal. From the gullet the food passes to the stomach. The muscles in the wall of the stomach squeeze and relax, mixing the food with the gastric juice and acids made in the wall of the stomach.

Enzymes in the gastric juice help to digest proteins, while the acids help to kill bacteria. From the stomach the food passes on and proteases act on the proteins.

From the stomach the food passes a little at a time into small intestine, which is a folded, long, narrow tube. In duodenum food is mixed with pancreatic juice and bile. Bile from liver breaks up oil.

When food reaches small intestine, it is a thick liquid. The food is absorbed through small intestinal wall and finally into blood. The waste products move into large intestine. Here a lot of water and minerals are absorbed into blood. The residue from small intestine undergoes decay and become faeces, which are passed into rectum where they are stored before being pushed through an opening called anus.

## RECALL AND ANALYSE

1. It is important to avoid it because they can trigger abdominal pain in some people and may lead to indigestion.
2. They stimulate contractions in the digestive tract, which can either slow down the emptying of the stomach and worsen constipation or speed up movements leading to worsening diarrhea.

## RECALL AND APPLY

1. All four types are used for it:

Canines---- for tearing

Incisors---- for cutting and biting it

Molars---- for grinding it

Pre-molars--- for crushing it

2. Following organs are involved in digestion:

Mouth

Oesophagus

Stomach

Small Intestine

Large Intestine

### SUBTOPICS

- Explain the particle theory of matter.
- Use particle model of matter to investigate the movement and arrangement of particles in three states.
- Explain why gases and liquids take the shape of their containers but solids do not, in terms of the Particle theory of matter.
- Discuss, using the particle theory of matter, why liquids and gases can flow easily but solids cannot.
- Interpret the evidence for the existence of the particles in matter by observing daily life examples (Adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water).
- Apply the particle theory of matter to explain diffusion.
- Explain the changes in states: melting, freezing, evaporation, condensation and sublimation using the particle model of matter.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 5

**Topic:** Matter as Particles

### Subtopics:

- Introduction
- Particle Theory of Matter
- Particles in solids, liquids and gas
- Changing state:
  - Solid to Liquid
  - Liquid to Solid
  - Liquid to Gas
  - Gas to Liquid
  - Solid to Gas

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objective:

To give clear concepts of matter and its states

### Learning Outcomes:

- Explain the particle theory of matter.
- Use particle model of matter, investigate the movement and arrangement of particles in three states.
- Explain why gases and liquids take the shape of their containers and solids do not in terms of particle theory of matter.
- Discuss using the particle theory of matter why liquids and gases can flow easily but solids cannot.
- Interpret the evidence for the existence of the particles in matter by observing daily life examples by adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water and evaporating salt water.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Flash cards-state of matter (example water)

### Starter Activity (5 min)

- Flash cards with images of water will be shown, in all three states.

## Teacher Ideas

- Randomly ask students to comment on images.

### **Lesson Methodology (30 min)**

- Teacher will write key words on the board.
- Students will be asked to open their books to assigned page numbers and read silently, teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will follow the images referred.
- At the end, quick analysis will be done.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

- Ask students to attempt Quick Review on page # 53.
- Ask students to attempt relevant Unit Review questions

### **Home learning**

- Ask students to read the topic for comprehension.
- Ask students to make a list of five examples from daily life showing changes in states of matter.

### **Lesson Evaluation (10 min)**

- Ask students to attempt worksheet # 1

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 5

**Topic:** Matter as Particles

### Subtopics:

- Evidence for Kinetic Theory
- Particles in constant motion in liquids and gases
- There are spaces between particles
- Gases are tiny molecules in mostly empty spaces
- Gases and liquids can flow

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To explain the topic with evidence.
- To enable students to understand the states or changes in matter at molecule level.

### Learning Outcomes:

- Apply the particle theory of matter to explain diffusion.
- Explain the changes in states, melting, freezing, evaporation, condensation and sublimation using the particle model of matter.

### Resources:

- Textbook (NAS Book 6)
- Charts

### Starter Activity (5min)

- Ask students to share the observations from the list they prepared as home work. Comment.
- Write key words on the board.

### Lesson Methodology (30 min)

- Ask students to read silently from the assigned page numbers.
- Loud reading will be done by the teacher.
- Explanation of the topic will be done. Charts showing states of matter at molecular level will be used effectively.
- A quick analysis will be given at the end.

## Teacher Ideas

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

Ask students to complete remaining questions of Unit Review.

**Home learning**

Ask students to study the topic at home for revision.

**Lesson Evaluation (10 min)**

Ask students to attempt worksheet #2.

**Further Notes**

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## Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Write the four main points in the particle model.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

Q2. Complete the following.

- a. \_\_\_\_\_ are completely incompressible.
- b. In \_\_\_\_\_ the particles have no fixed pattern and are close together.
- c. In \_\_\_\_\_ there is no fixed pattern and the particles are far apart.
- d. When \_\_\_\_\_ energy is absorbed or released \_\_\_\_\_ can change from state to another.
- e. \_\_\_\_\_ is the change of state from solid to liquid.

## Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Give any three evidences that support the kinetic theory.

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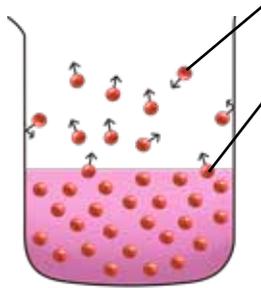
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Q2. Label the given diagram.



Q3. When you smell freshly bake pizza, what phenomenon is behind it?

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## Answer key Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Write the four main points in the particle model.

- All matter is made up of tiny particles.
- These particles are constantly moving.
- These particles have spaces between them.
- Adding heat to matter makes the particles move faster.

Q2. Complete the following.

- a. **Solids** are completely incompressible.
- b. In **liquids** the particles have no fixed pattern and are close together.
- c. In **gas** there is no fixed pattern and the particles are far apart.
- d. When **heat** energy is absorbed or released **matter** can change from state to another.
- e. **Melting** is the change of state from solid to liquid.

## Worksheet #2

Name: \_\_\_\_\_

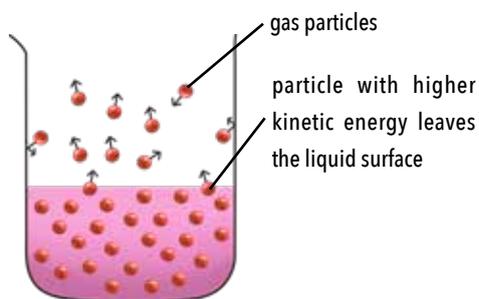
Date: \_\_\_\_\_

Q1. Give any three evidences that support the kinetic theory.

**Answer**

- Particles are in constant motion in liquids and gases.
- There are spaces between particles.
- Gases are tiny molecules in mostly empty spaces.

Q2. Label the given diagram



Q3. When you smell freshly baked pizza, what phenomenon is behind this?

It is the phenomenon of diffusion.

## Answer key

### NAS book 6

### Unit 5

### Quick Review

### Page 53

1.

1. Solid
2. Volume, shape
3. Gas
4. Heat
5. Matter

### Unit Review

#### Choose the correct answer

1.	c. it has mass and occupies space
2.	c. sound
3.	d. both a and b
4.	b. air
5.	c. it has a definite shape

### Vocabulary Review

1.	Sublimation
2.	Diffusion
3.	Freezing

### Observe and Answer

Diffusion is taking place as shown in the picture. The colour dye in the glass are showing movement of molecules of dye in the transparent liquid.

### Recall and Response

Q1.

1. Particles
2. Gases
3. Random
4. Different
5. Mingle
6. Diffusion

**Q2.**

- a. It is the process by which particles mix and spread through collisions with each other.
- b. It is the process by which gas turns into liquid form.
- c. The process by which liquid changes into gas.
- d. When a solid changes directly into gas, this process is known as sublimation.

**Recall and Analyse****Q1.**

- a. Solids are rigid because particles can move a little, as they vibrate back and forth but remain in their relatively fixed positions.
- b. Liquids have a fixed volume yet they take the shape of a container because the particles can move around freely then they can in a solid.
- c. Gases are easily compressed as their particles are pressed close together in available spaces. They can take up a smaller volume.

**Q2.**

- a. The balloon gets bigger. In hot air balloons, particles gain energy and move around quickly. Hot air takes greater volume than the same mass of a cool gas.
- b. A solid has a fixed shape because its particles can only vibrate in limited spaces.
- c. We cannot squeeze a syringe full of water as there is no space and it cannot be compressed any further.

**Recall and Apply****Q1.**

- a. It is possible to smell a perfume a person is wearing from some distance, as particles diffuse in the air. The particles of perfume move from a place of higher density to lower density.
- b. The water will evaporate completely due to heat, the increase in kinetic energy will enable water particles to evaporate.

**Q2.**

At 240 degrees it will be in gaseous state.

**Q3.**

- a. The change of Iodine crystals into vapours is called sublimation. This is the process by which solids directly change into gas.
- b. A gas can be compressed into a smaller volume by applying pressure as there are empty spaces between the gas particles.

### SUBTOPICS

- Describe the structure of matter in terms of particles (i.e., atoms and molecules).
- Describe molecules as a combination of atoms (e.g.,  $\text{H}_2\text{O}$ ,  $\text{O}_2$  &  $\text{CO}_2$ ).
- Recognize the names and symbols for some common elements (first 10 elements of Periodic Table) and recognize their physical properties.
- Differentiate that some elements are made of atoms and some elements exist as molecules and have different properties to a single atom of the element.
- Explain that compounds are formed by different types of elements joining together chemically forming a new substance (.e.g. burning magnesium or steel wool in air/oxygen).
- Illustrate the formation of a compound with the help of a word equation.
- Distinguish between elements and compounds.
- Explore the common elements and compounds in our daily life-(carbon, nitrogen, hydrogen, Aluminium, water, common salt, sugar).
- Categorize elements into metals and non-metals (first 10 elements) based on their physical properties.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 6

**Topic:** Elements and Compounds

### Subtopics:

- Introduction
- Elements
- Chemical symbols of elements
- First ten elements and their properties
- Molecules—Types of molecules

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives

To provide concrete basis for the subject of Chemistry through explanation of the topic.

### Learning Outcomes:

- Describe the structure of matter in terms of particles (i.e., atoms and molecules).
- Describe molecules as a combination of atoms (water, oxygen, carbon dioxide).
- Recognize the name and symbols for some common elements (first ten elements of periodic table) and recognize their physical properties.
- Differentiate that some elements are made of atoms and some elements exist as molecules and have different properties to a single element of molecules.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Scientific models of elements and molecules

### Starter Activity (10 min)

Set up a table and display models of atoms and molecules. Also arrange pencil, pen, ink, inflated balloon and glass of water.

Ask students to firstly identify the states of matter in objects displayed.

Then show models of atoms and molecules and share that all things are made up of atoms and molecules.

## Teacher Ideas

### **Lesson Methodology (30 min)**

- Key words will be written on the board.
- Students will be asked to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will follow. The scientific models must be used to make the learning experience richer.
- Quick analysis will be given at the end.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt relevant questions of Unit Review.

### **Home learning**

- Ask students to read the topic for revision.
- Ask students to visit websites on Internet to watch subject related videos.

### **Lesson Evaluation (5 min)**

- Ask students to attempt worksheet # 1.

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 6

**Topic:** Elements and compounds

**Subtopics:**

- Compounds
- Naming Compounds
- Chemical Formula
- Formation of Compounds
- Molecular Model
- Living and non-living
- Difference and similarities between elements and compounds
- Properties of metals and non-metals
- Uses of elements and compounds
- Illustrate the formation of a compound with the help of a word equation
- Distinguish between elements and compound

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objectives:**

To impart knowledge of the topic in detail for clear concepts.

**Learning Outcomes:**

- Explain that compounds are by different types of elements joining together chemically to form a new substance.
- Explore the common elements or compounds in our daily life (Carbon, Nitrogen, Aluminum, Water, Table Salt)
- Categorize elements into metals and non-metals (first ten elements) based on their physical properties.

**Resources:**

- Textbook (NAS Book 6)
- Charts-Periodic Table
- Laboratory Material

**Starter Activity (10 min)**

Take students to the laboratory and show burning of Magnesium. Let them observe the change and note.

**Teacher Ideas**

### **Lesson Methodology (30 min)**

- Ask students to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will follow. Charts, Periodic Table and board will be used effectively.
- Quick analysis will be done at the end.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to do remaining questions of Unit Review.

### **Home learning**

- Ask students to study the topic for reinforcement.
- Write their observations of the starter activity in their notebooks.

### **Lesson Evaluation (5 min)**

- Ask students to attempt worksheet #2.

### **Further Notes**

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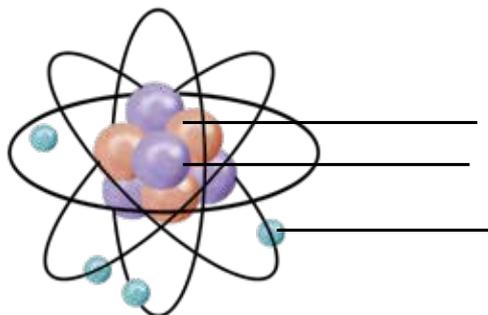
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## Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Label the given diagram.



Q2. Write the charges of given particles of an atom.

- Proton
- Neutron
- Electron

Q3. Complete:

1. The air around us is made up of \_\_\_\_\_.
2. \_\_\_\_\_ are substances that are made up of one kind of atom.
3. The gas that we inhale is \_\_\_\_\_ which is an element.

## Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q.1. Select from the given list and enter in the respective column.

Oxygen    Carbohydrate    Carbon    Chlorine    Sodium Chloride

Elements	Compounds
Chlorine	

Q.2. Join the name of elements to the compound it is part of.

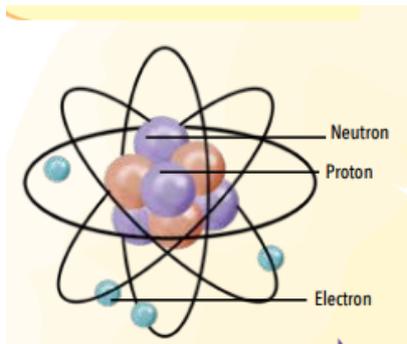
Elements	Compounds
Zinc ( Zn ), Chlorine(Cl)	Water(H <sub>2</sub> O)
Hydrogen(H), Oxygen(O)	Zinc Chloride (ZnCl <sub>2</sub> )
Hydrogen(H), Chlorine (Cl)	Hydrochloric Acid(HCl)
Carbon(C), Oxygen(O)	Methane (CH <sub>4</sub> )
Carbon(C), Hydrogen(H)	Carbon dioxide(CO <sub>2</sub> )

## Answer Key Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Label the given diagram.



Q2. Write the charges of given particles of an atom.

- Proton = positive
- Neutron = neutral
- Electron = negative

Q3. Complete:

1. The air around us is made up of **matter**
2. **Elements** are substances that are made up of one kind of atom.
3. The gas that we inhale is **Oxygen** which is an element.

## Answer Key Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Q.1.** Select from the given list and enter in the respective column.

Oxygen    Carbohydrate    Carbon    Nitrogen    Chlorine    Sodium Chloride

Elements	Compounds
Oxygen	Carbohydrates
Carbon	Sodium Chloride
Nitrogen	
Chlorine	

**Q2.** Join the name of elements to the compound it is part of.

Elements	Compounds
Zinc (Zn) ,Chlorine(Cl)	Water (H <sub>2</sub> O)
Hydrogen(H), Oxygen(O)	Zinc Chloride (ZnCl <sub>2</sub> )
Hydrogen(H), Chlorine (Cl)	Hydrochloric Acid (HCl)
Carbon(C), Oxygen(O)	Methane (CH <sub>4</sub> )
Carbon(C), Hydrogen(H)	Carbon dioxide (CO <sub>2</sub> )

## Answer key

### NAS book 6

### Unit 6

### Unit Review

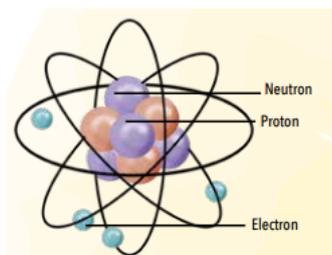
#### Choose the correct answer

1.	d.matter
2.	b.mercury
3.	a.1
4.	a. proton
5.	d. metals and non-metals

#### Vocabulary Review

1.	Atoms
2.	Element
3.	Chemical formula

#### Observe and Answer



#### Recall and Apply

Q1.

a. Chemical symbols are used for the sake of simplicity, in a special way so that it is easy to record and identify them.

Q2.

Answer

Following are four non-metals:

1. Hydrogen: It is a colourless gas.
2. Helium: It is a colourless gas.
3. Boron: It is a black and lustrous non-metal, which is solid.
4. Neon: it is orange red gas.

## Recall and Analyse

Q1.

Sodium and chlorine are combined in sodium chloride.

Q2.

Hydrogen and Sulphur are combined in Hydrogen sulphide.

Q3.

Magnesium and oxygen are combined in Magnesium Oxide.

## Recall and Response

Q1.

Metals: Iron

Non-metals: Sodium, Sulphur, Nitrogen, Chlorine

Q2.

The elements that exist as molecules rather than single atoms are Oxygen, Hydrogen, etc.

Q3.

Isotopes

### SUBTOPICS

- Demonstrate that mixtures are formed when two or more substances mix with each other physically without the formation of a new substance.
- Identify different types of mixtures.
- Describe the difference between elements, compounds, and mixtures.
- Differentiate between pure substances and mixtures on the basis of their formation and composition.
- Describe alloys as mixtures of metals and some other elements.
- Identify and explain examples of common mixtures from daily life.
- Justify why air is considered as a mixture of gases.
- Demonstrate ways of separating different mixtures.
- Demonstrate the process of solution formation (using water as a universal solvent).

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 7

**Topic:** Mixtures

### Subtopics:

- What are mixtures?
- Everyday mixtures-Air is a mixture
- Types of mixtures
- Alloy

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objective:

To learn about formation of substances with physical change.

### Learning Outcomes:

- Demonstrate that mixtures are formed when two or more substances mix with each other physically without the formation of a new substance.
- Identify and explain different types of mixtures from daily life.
- Describe the difference between elements, compounds and mixtures.
- Differentiate between pure substances and mixtures on the basis of their formation and composition.
- Demonstrate the process of solution formation (using water as a natural solvent).
- Justify why air is considered as a mixture of gases.
- Describe alloys as mixtures of metals and some other elements.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Miscellaneous items for activity

### Starter Activity (5 min)

Arrange the following items:

- Inflated balloon
- Table salt
- Steel spoon

## Teacher Ideas

Ask students few questions, e.g.,

What is inside the balloon? (Air)

Then ask if air is a mixture or compound?

Ask similar questions for table salt and silver spoon.

### **Lesson Methodology (30 min)**

- Write key words on the board.
- Ask students to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will follow.
- At the end, quick analysis will be done.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt relevant questions of Unit Review.

### **Home learning**

- Ask students to read the topic for revision.
- Ask students to take 250 ml or one glass of drinking water and add 2 table spoons of sugar and stir until it is dissolved. Record their observations in their notebooks.

### **Lesson Evaluation (10 min)**

Ask students to do worksheet #1.

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 7

**Topic:** Mixtures

### **Subtopics:**

- Methods of separating mixtures
  - Filtration
  - Evaporation
  - Distillation
  - Uses of Distillation
  - Crystallization
  - Sublimation
  - Paper Chromatography
  - Sweet Chromatography
- Using Chromatography

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### **Learning Objective:**

To give knowledge of the topic with separately describing the methods with examples from daily life.

### **Learning Outcome:**

- Demonstrate ways of separating mixtures.

### **Resources:**

- Textbook (NAS Book 6)

### **Starter Activity (5 min)**

- Arrange filtration and paper chromatography experiments in the laboratory.
- Take students to the laboratory and explain the experiments.

### **Lesson Methodology (30 min)**

- Ask students to open their books to assigned page numbers and read silently.
- Loud reading will be done by the teacher.
- Explanation will be done by the teacher.
- A quick analysis will be given at the end.

## Teacher Ideas

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

- Ask students to attempt Quick Review on page # 81 and remaining questions of Unit Review.

**Home learning**

- Ask students to study the topic for revision.
- Ask them to observe solutions around them where water is the natural solvent and note.

**Lesson Evaluation (10 min)**

Ask students to share their observations with the class, randomly select.

**Further Notes**

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## Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following.

- A pure substance is \_\_\_\_\_
- A mixture is formed \_\_\_\_\_
- Air is a mixture of \_\_\_\_\_ and \_\_\_\_\_
- Sea water is a \_\_\_\_\_

Q2. Mark whether True or False.

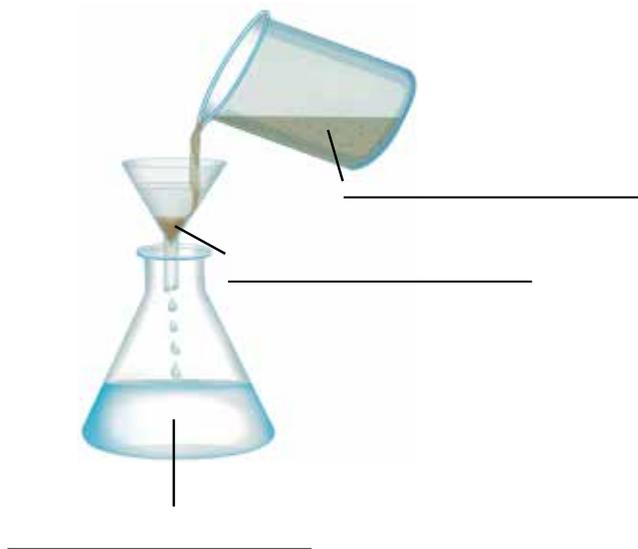
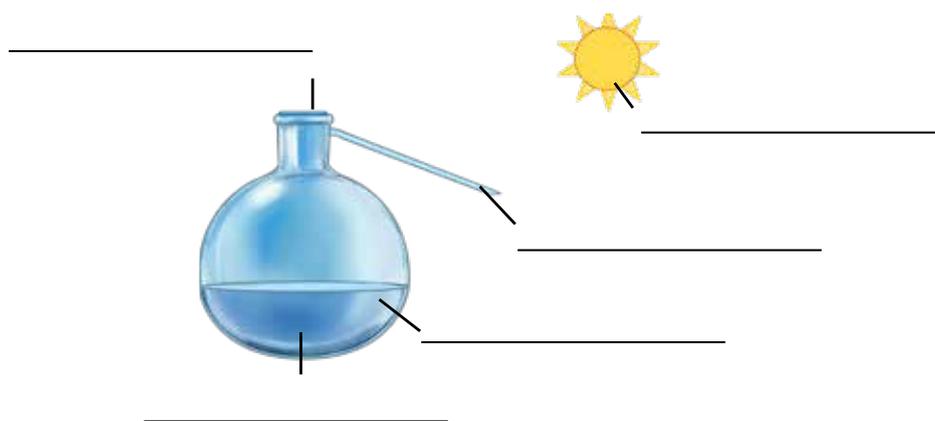
Statement	True/False
Compounds have no fixed composition	
Mixtures contain two or more substances	
Compounds have properties different than those elements who join together to form a compound	
Common table salt dissolves quickly in water	

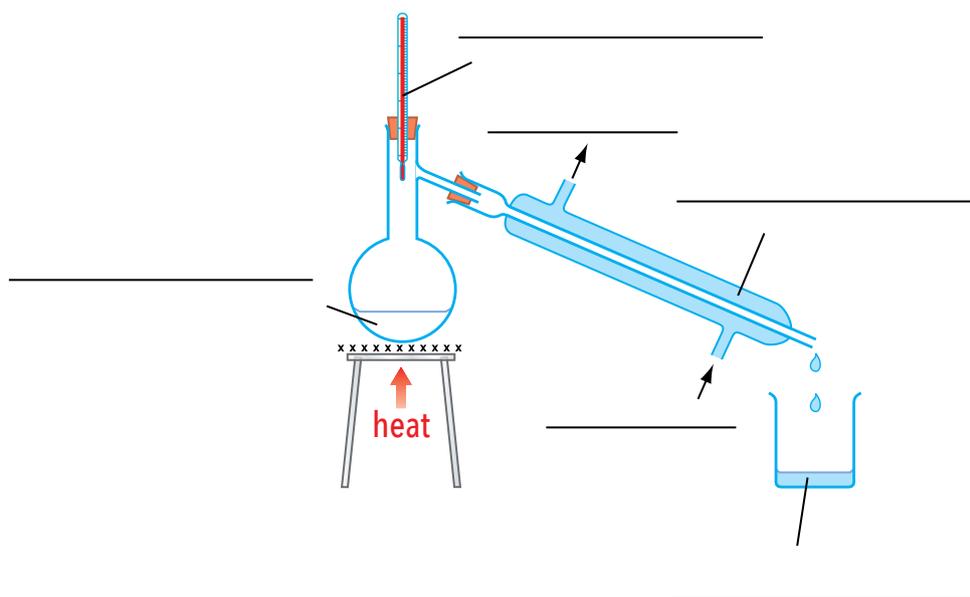
## Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Identify the type of mixture separation shown in the diagrams and label them.





Q2.

i. What is sublimation?

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ii. What is chromatography?

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## Answer Key Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Complete the following.

- A pure substance is **matter when it has same composition and properties.**
- A mixture is formed **when several substances are mixed together but are not joined chemically.**
- Air is a mixture of **oxygen, nitrogen and several other gases.**
- Sea water is a **mixture.**

Q2. Mark whether True or False.

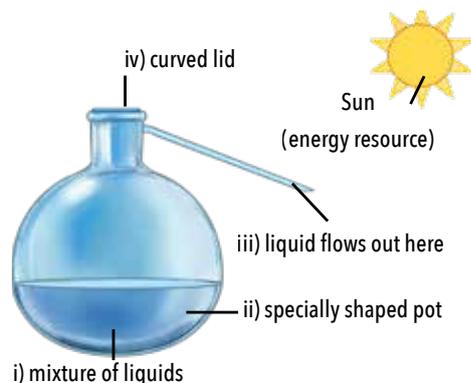
Statement	True/False
Compounds have no fixed composition	<b>False</b>
Mixtures contain two or more substances	<b>True</b>
Compounds have properties different than those elements who join together to form a compound	<b>True</b>
Common table salt dissolves quickly in water	<b>True</b>

## Answer Key Worksheet #2

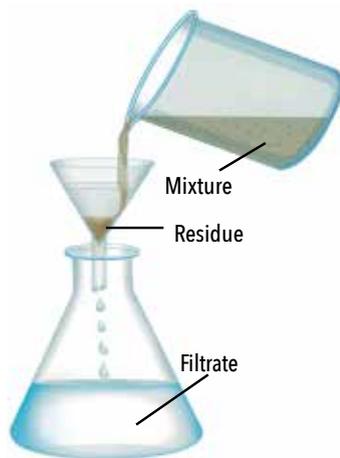
Name: \_\_\_\_\_

Date: \_\_\_\_\_

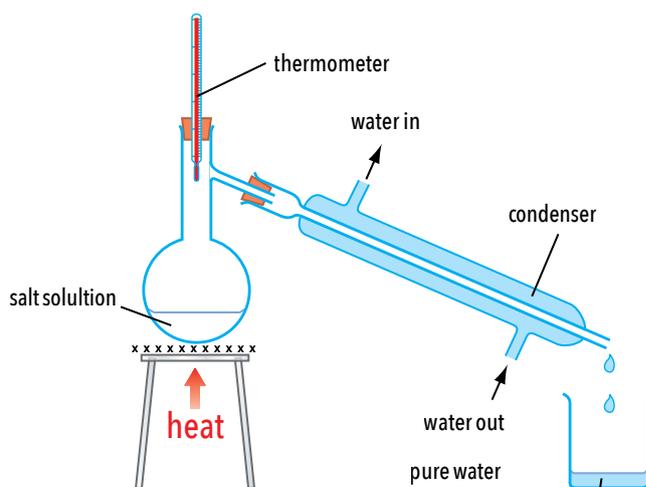
Q1. Identify the type of mixture separation shown in the diagrams below.



**Alembic for Distillation**



**Filtration**



**Distillation**

**Q2.**

**i.** What is sublimation?

**When the solid directly changes to gaseous state due to heat.**

**ii.** What is chromatography?

**A method of dissolved chemical substances by their difference in speed across a sheet of paper.**

## Answer key

### NAS book 6

### Unit 7

### Quick Review

### Page 81

#### Q1.

- a. A mixture is made up of different substances that are not joined together chemically.
- b. The amount of substance in a mixture can be changed.
- c. Grains of sand are bigger than the holes in the filter paper.

#### Q2.

- i. Solvent
- ii. attraction
- iii solvent

### Unit Review

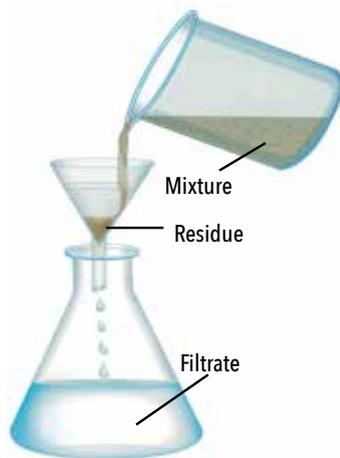
#### Choose the correct answer

1.	b. filtration
2.	a. Evaporation
3.	c. Sublimation
4.	a. colloid
5.	a. Copper sulphate

### Vocabulary Review

1.	Distillation
2.	Residue

### Observe and Answer



### Recall and Response

1. B
2. D
3. F
4. C
5. A
6. E
7. G

### Q2.

- a. the solution
- b. solvent
- c. chromatogram

### Recall and Analyse

#### Q1.

In chromatography some substances travel further up the paper than others due to differences in their speeds in chromatogram. Thus, they separate.

#### Q.2.

It is possible to identify the student by running a chromatogram, using ink from their pens. However, if two students are using same brand then the results could be misleading.

Chromatography is useful in many ways in our daily lives. Following three are useful methods for applying chromatography.

#### i. Creating Vaccinations

Chromatography is useful in determining which antibiotics fight various diseases and viruses.

In the fight against the Ebola virus, scientist used chromatography to develop Zmapp as experimental immunization. Through the process scientists found out which antibodies are more useful in fight against this virus.

## ii. Beverage Testing

Many drink manufacturers to ensure that each bottle of their product is exactly the same, so we can rely on a consistent taste.

## iii. Drug Testing

As an analytical technique chromatography can accurately identify substances within the blood stream. It is widely used in sports to test athletes for doping or performance enhancing drugs.

### Q3.

- Sand can be separated from water through filtration and it's the residual substance that remains on the filter paper.
- Salt can be separated from water through evaporation. The solvent vapourises leaving behind salt.
- Dye could be separated through chromatography from the mixture, as it will remain on the chromatogram.

### SUBTOPICS

- Recognize energy as a physical quantity.
- Relate potential energy and kinetic energy.
- Demonstrate an energy transfer such as a bouncing ball by energy transfer diagram, e.g., gravitational potential energy → kinetic → elastic potential energy + thermal + sound → kinetic → gravitational potential energy, etc.
- State the Law of Conservation of Energy and explain how the law applies to different situations.
- Compare the renewable energy sources (wind, water, Sun, and plants) and non-renewable sources of energy (coal, natural gas, crude oil).
- Identify the advantages of using renewable energy resources.
- Assemble and demonstrate a solar panel to operate a small fan. (STEAM)
- Design and make a solar water heater. (STEAM)

**Class:** 6

**Subject:** General Science

**Unit:** 8

**Topic:** Energy

**Subtopics:**

- Energy around us
- Kinetic
- Potential-Gravitational Potential Energy(GPE)
  - Elastic Potential Energy
- Chemical PE
- Electrical Energy
- Thermal
- Nuclear
- Radiational Energy
- Light Energy
- Sound Energy

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objectives**

- To introduce the topic and explain in detail.
- To enable students to define and recognize the different forms of energy.

**Learning Outcomes:**

- Recognize energy as a physical quantity.
- Relate potential energy and kinetic energy.
- Demonstrate an energy transfer such as bouncing ball by energy transfer diagram.,
- Gravitational Potential Energy—Kinetic—elastic potential Energy+sound—Kinetic—elastic+GPE,etc.

**Resources:**

- Textbook (NAS Book 6)
- Charts

**Starter Activity (5 min)**

- Call out 2 students and give them a tennis ball. Ask them to throw and catch the ball for a minute. Rest of the class will observe and comment later keeping in mind change in energy/ shift in energy. Teacher will briefly share the two energies involved.

**Teacher Ideas**

### **Lesson Methodology (30 min)**

- Ask students to open their books to assigned page numbers and read silently.
- Loud reading will be done by the teacher.
- Explanation of the topic will be done. Teacher may use examples from everyday life as well as the book.
- At the end quick analysis will be done.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt relevant questions of Unit Review.

### **Home learning**

Ask students to revise the topic and learn names of different types of energies from the book.

### **Lesson Evaluation (10 min)**

Ask students to attempt worksheet number 1.

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 8

**Topic:** Energy

### Subtopics:

- Conversion of energy
- The energy picture
  - Chemical Energy into Heat and Light Energy
  - Chemical energy to Electrical Energy
  - Electrical Energy to Heat and Light Energy
  - Wind into mechanical energy
  - Nuclear Energy to Heat and Light Energy
  - Solar Energy into Electrical Energy
- Fuel for electricity
- Sources of energy-non-renewable energy sources
  - Fossil fuels
  - Nuclear fuels

Renewable energy resources: Solar Energy, water energy, or Hydropower; energy from moving water, wind energy, Geothermal energy, Biogas

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To enable students to observe and identify energy changes all around us.
- To gain knowledge as to how this energy conversion is being used for better quality of life with everyday examples.

### Learning Outcomes:

- State the law of conservation of energy and explain how the law applies to different situations.
- Compare the renewable energy sources (wind, water, Sun, and plants) and non-renewable sources of energy (coal, natural gas, crude oil)
- Identify the advantages of using renewable energy resources.
- Assemble and demonstrate a solar panel to operate a small fan (STEM).
- Design and make a solar water heater (STEM)

## Teacher Ideas

### **Resources:**

- Textbook (NAS Book 6)
- Charts
- Miscellaneous items

### **Starter Activity (10 min)**

- Arrange the following items on the display table:  
Torch, Inflated balloon, match box, Candle on stand
- Take precautions and call few students to perform the activity;
- Firstly, ask the student to release air from inflated balloon.
- Ask second volunteer to turn on the torch.
- Light up the candle with a match
- Now ask the class to share what they have observed. Yes, the demonstration showed conversion of energy.

### **Lesson Methodology (25 min)**

- Ask students to open their books to assigned page numbers and read silently.
- Loud reading will be done next.
- Explanation will be done. The examples from the book and the environment will be quoted.
- At the end quick analysis will be done.
- **A visit to a dam or local hydropower plant is suggested.**

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

- Ask students to attempt Quick Review on page #91.
- Ask students to attempt remaining questions of Unit Review.

### **Home learning**

Ask students to study the topic at home.

### **Lesson Evaluation (10 min)**

Ask students to attempt worksheet #2.

## Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q.1 Answer the given questions.

a. What type of energy is more in fast moving objects?

\_\_\_\_\_

b. What is energy?

\_\_\_\_\_

c. Where is electrical energy to run the train?

\_\_\_\_\_

d. Which form of energy increases with height?

\_\_\_\_\_

Q.2 Look at the given pictures and identify the form of energy shown in each.

a.



c.



b.



## Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q. Find the hidden ten words in the puzzle (look in all directions).

S	O	L	A	R	E	K	T	H	O	M	E	E	N
L	C	E	Y	M	N	E	H	O	H	P	A	E	A
N	C	H	E	M	I	C	A	L	T	A	T	C	L
S	M	N	U	C	L	E	A	R	E	N	A	L	O
L	I	N	L	N	M	A	A	I	S	C	I	I	S
C	P	C	I	C	E	H	T	L	C	T	I	E	L
M	O	R	N	I	C	E	N	R	R	G	Y	I	S
N	T	N	C	T	H	A	L	E	M	S	N	A	L
C	E	M	C	E	A	T	C	I	T	S	A	L	E
H	N	T	C	N	N	I	I		P	M	I	N	L
N	T	S	A	I	I	I	E	R	A	E	A	D	P
R	I	E	E	K	C	I	I	A	O	E	L	N	T
O	A	T	L	E	A	I	E	A	C	N	I	I	E
N	L	M	Y	L	L	L	L	T	C	Y	L	W	I

## Answer Key Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Answer the given questions.

a. What type of energy is more in fast moving objects?

**Kinetic Energy**

b. What is energy?

**It is the ability to do work.**

c. Where is electrical energy produced to run the train?

**Power House**

d. Which form of energy increases with height?

**Gravitational Potential Energy**

Q2. Look at the given pictures and identify the form of energy in each.

a.



**Electrical Energy**

b.



**Heat Energy → Mechanical Energy**

c.



**Sound Energy**

## Answer Key Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Q. Find the hidden ten words in the puzzle (look in all directions).**

S	O	L	A	R	E	K	T	H	O	M	E	E	N
L	C	E	Y	M	N	E	H	O	H	P	A	E	A
N	C	H	E	M	I	C	A	L	T	A	T	C	L
S	M	N	U	C	L	E	A	R	E	N	A	L	O
L	I	N	L	N	M	A	A	I	S	C	I	I	S
C	P	C	I	C	E	H	T	L	C	T	I	E	L
M	O	R	N	I	C	E	N	R	R	G	Y	I	S
N	T	N	C	T	H	A	L	E	M	S	N	A	L
C	E	M	C	E	A	T	C	I	T	S	A	L	E
H	N	T	C	N	N	I	I		P	M	I	N	L
N	T	S	A	I	I	I	E	R	A	E	A	D	P
R	I	E	E	K	C	I	I	A	O	E	L	N	T
O	A	T	L	E	A	I	E	A	C	N	I	I	E
N	L	M	Y	L	L	L	L	T	C	Y	L	W	I

## Answer key

### NAS book 6

### Unit 8

### Quick Review

### Page 91

#### Q1.

##### a. A motor

electrical energy+ sound energy+ heat energy

##### b. A loudspeaker

electrical energy+ kinetic energy+ heat energy+ sound energy

##### c. An electric bell

electrical energy+ kinetic energy+ heat energy+ sound energy

### Unit Review

#### Choose the correct answer

1.	a. Renewable and non-renewable
2.	a. Electric power
3.	b. biogas
4.	c. mechanical energy into sound energy
5.	b. wind

### Vocabulary Review

1.	a. heat energy
2.	b. mechanical energy
3.	DC or AC electric current

### Observe and Answer

Q1. a. Light energy (solar)----- Electric Energy

b. Electrical Energy-----kinetic Energy+ Heat Energy+ Sound Energy

c. Elastic Strain Energy-----Mechanical Energy+ Sound Energy

### Recall and Response

#### Q1.

a. Its kinetic energy due to which when pedal up it moves faster.

b. Kinetic energy is changed into heat/thermal energy.

**Q2.**

- a. Coal in which combustion reaction converts chemical energy into light and heat energy.
- b. Tides are a good example. They are the short-term periodic rise and fall in oceans.
- c. Example is bow and arrow. The kinetic energy to the arrow is supplied by the conversion of the elastic potential energy of the string which is developed upon stretching the elastic string of the bow and releasing into the arrow.

**Q3.**

Geothermal energy is form of energy where heat energy from within Earth is captured and harnessed for cooking, bathing, space heating, electric power generation and other uses. Heat from the Earth's interior generates surface phenomena such as lava flows, geysers, fumaroles, hot springs and mud spots.

**Q4.**

Solar energy is the energy from the Sun. It can be converted from radiant energy from the Sun to electrical or thermal energy. We use solar energy for many purposes such as powering and heating homes, producing electrical energy, etc.

**Q5.**

Burning coal, for example releases toxic particles like sulphur oxide and heavy metals into the atmosphere. These compounds lead to many serious side effects such as acid rain and respiratory damage in humans.

Pollutants from the burning of the fossil fuels have been linked to diseases like Cancer and asthma in several scientific studies.

**Q6.**

The following are renewable energy sources used to generate electricity only.

- i. solar energy
- ii. Wind energy
- iii. Hydropower
- iv. geothermal

**Recall and Analyse****Q.**

Following are four useful methods in saving energy:

- Adjusting Daily Behaviour
- Replacing the light bulbs
- Investing in energy efficient appliances

### SUBTOPICS

- Explain the phenomena of static electricity in everyday life.
- Recognize electric current as a flow of charges.
- Describe a simple circuit as a path for flow of charges.
- Differentiate between open and closed circuits.
- Draw and interpret simple circuit diagrams (using symbols).
- Describe the characteristics of series and parallel circuits.
- Draw and construct series and parallel circuits.
- Identify the use of series and parallel electric circuits in daily life.
- Investigate the factors that affect the brightness of bulbs or speed of motors (Number of batteries, Number of Bulbs, Type of wire, Length of wire, Thickness of wire).
- Assemble and operate a trip wire security alarm system using simple items. (STEAM)

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 9

**Topic:** Electricity

### Subtopics:

- Electricity
- Natural Electricity
- Electrical Energy
- Current Electricity
- Electric Current
- Resistance

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To give further knowledge of an important form of energy, i.e., electric energy.
- To explain the phenomenon of static electricity.

### Learning Outcomes:

- To explain the phenomenon of static electricity in everyday life.
- Recognize electric current as a flow of charges.
- Describe a simple circuit as a path of flow of charges.

### Resources:

- Textbook (NAS Book 6)
- Charts
- A simple circuit
- Miscellaneous Items (inflated balloon, small pieces of paper, sweater and woolen clothes)

### Starter Activity (10 min)

- Arrange the items on the display table. Ask for volunteers from class and give balloons or combs to them.
- Now ask them to rub the objects on their woolens and then take them close to pieces of paper. The pieces will be attracted towards balloons.
- Introduce the word static electricity and write key words on the board.

## Teacher Ideas

### **Lesson Methodology (25 min)**

- Ask students to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will be done.
- Use Physics laboratory as a resource to arrange simple circuit. Show a circuit in the class with a light bulb to further elaborate the topic.
- At the end, quick analysis will be given.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt some relevant questions from Unit Review.

### **Home learning**

Ask students to read the topic at home for revision.

### **Lesson Evaluation (10 minutes)**

Ask students to attempt worksheet #1.

### **Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 9

**Topic:** Electricity

**Subtopics:**

- Recognising Symbols
- Circuit Symbols
- Open and Closed Circuits
- Series Circuits
- Parallel Circuits
- Similarities and differences between series and parallel circuits.
- How does an electric circuit work?
- Placing bulbs in a series circuit
- Changing the resistance
- Changing the voltage

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

**Learning Objective:**

- To learn further details about circuits.

**Learning Outcomes:**

- Differentiate between open and closed circuits.
- Draw and interpret simple circuit diagrams (using symbols).
- Describe the characteristics of series and parallel circuits.
- Draw and construct series and parallel circuits.
- Identify the use of series and parallel circuits in daily life.
- Investigate the factors that affect the brightness of bulbs or speed of motors (Number of batteries, Number of bulbs, Types of wire, Thickness of wire).
- Assemble and operate a trip wire security alarm system using simple items (STEM).

**Resources:**

- Textbook (NAS Book 6)
- Charts
- Two small balls

**Starter Activity (10 min)**

- Students will play the following game and teacher will facilitate.

**Teacher Ideas**

to demonstrate how series and parallel circuits work.

- Ask students to stand in a circle. Give two small balls to a student. Ask the students to pass the ball around the circle to demonstrate a closed series circuit.
- Next, separate two students from the circle as they are at a distance hence cannot reach each other. Pass the ball again to show an open circuit that comes to a stop due to a break.
- Now, place two rows of students on either side of the circle, connecting them; pass three balls to the students noting that they can divide the balls when they reach a break in the path(circle path or centre line path).
- Share this is how a closed parallel circuit works.
- At the end, ask two students in one of the centre line paths to move away from one another to demonstrate a circuit break. Pass the ball again noting that when they reach the break, the other circuit is still intact and active.

### **Lesson Methodology (30 min)**

- Ask students to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation will be done. Charts and board will be affectively used.
- At the end, quick analysis will be given.

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

- Ask students to attempt Quick Review on page # 104.
- Ask students to attempt and complete Unit Review.

### **Home learning**

Ask students to study the topic for revision and reinforcement.

### **Lesson Evaluation (5 min)**

Ask students to attempt worksheet # 2.

## Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Q.1 Define

- Static electricity
- Electrical Energy
- Electric Current
- Conductors
- Insulators

### Q.2 Mark the statements as True or False.

Statement	True/False
Static electricity is also known as natural electricity	
Shining copper wires are bad conductors of heat	
Plastics and rubbers are bad insulators	
Battery is a energy source in the circuit	

## Worksheet # 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Q.1** Select from the given word list to fill in the blanks.

switch resistance wire connected open

1. The opposition to the flow of current is known as \_\_\_\_\_
2. A \_\_\_\_\_ is used to open and close a circuit.
3. Electron charge cannot flow in a \_\_\_\_\_ circuit.
4. All the devices \_\_\_\_\_ in a circuit receive current.
5. A \_\_\_\_\_ is a conductor that receives current.

**Q.2** Draw the symbols of the following.

- Battery
- Conductor(wire)
- Light Bulb
- Switch

## Answer Key Worksheet # 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Define

- **Static electricity**  
The build up of electricity of positive and negative is called static electricity. These charges stay on the object.
- **Electrical Energy**  
It is a type of energy, that is flow of electrons .
- **Electric Current**  
The flow of electrons(electric charges ) in one direction in a circuit is called electric current.
- **Conductors**  
They are materials that allow electric charges to move through them easily.
- **Insulators**  
The materials that do not allow electric charges to move through them, easily are known as insulators.

Q2. Mark the statements as True or False.

Statement	True/False
Static electricity is also known as natural electricity	True
Shining copper wires are bad conductors of heat	False
Plastics and rubbers are bad insulators	False
Battery is the energy source in the circuit	True

## Answer key Worksheet # 2

Name: \_\_\_\_\_

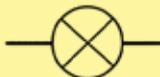
Date: \_\_\_\_\_

Q.1 Select from the given word list to fill in the blanks.

switch resistance wire open connected

1. The opposition to the flow of current is known as **resistance**.
2. A **switch** is used to open and close a circuit.
3. Electron charge cannot flow in an **open** circuit.
4. All the devices **connected** in a circuit receive current.
5. A **wire** is a conductor that receives current.

Q.2 Make the following circuit system.

Battery	Conductor (wire)	Light bulb	Switch
			

Answer key

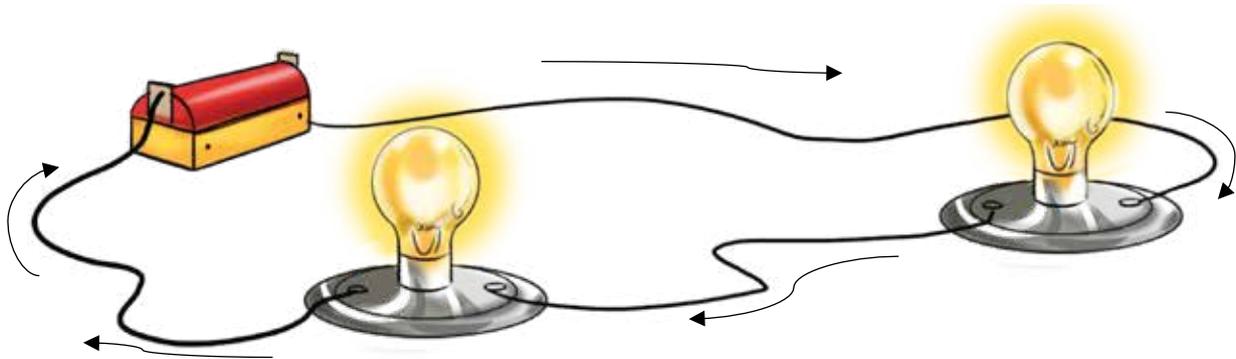
NAS book 6

Unit 9

Quick Review

Page 104

- The other bulb will not light up/stay off as the circuit is broken.



Unit Review

Choose the correct answer

1.	b.current
2.	d.none
3.	b.neutral
4.	a.electrons are transferred from one object to another
5.	a.current

Vocabulary Review

1.	Static
2.	Switch
3.	Battery cell

## Observe and Answer



**battery**



**wire**



**bulb**



**switch**

## Recall and Analyse

**Q1.**

- Bulb X will be less bright as Y is added because they are in a series circuit.
- There will be no change of brightness in bulb X and Y after addition of bulb Z, as it is placed in a parallel series.
- The bulbs will have less voltage so they will be less bright.
- However, if thickness is increased, the flow will find less resistance.

**Q2.**

The circuit 1 is series circuit and 2 is parallel circuit. Therefore, brightness of circuit 1 will be less than brightness of the circuits.

## Recall and Response

**Q.1**

- Due to rubbing electrons are transferred. The electron loser will become positively charged. And the other become negatively charged (the electron gainer).
- The transfer of electrons from a cloud to the ground during a lightning strike is an example of electrostatic electricity.

## Recall and Apply

If the metal object is charged, it means that there are equal number of electrons and protons when the negative object is held near the neutral metal object to be attracted to the negatively charged object. It is called charging by induction.

### SUBTOPICS

- Recognize that electric current has a magnetic field around it and it can be verified using a magnetic compass.
- Recognize that a freely moving magnet comes to rest pointing in a North-South direction.
- Describe how to magnetize a magnetic material. Describe how to de-magnetize a magnetic material.
- Construct an electromagnet and identify its application in everyday life.
- Compare different types of magnets (permanent, temporary and electromagnets).
- Recognize that there is a space around a magnet where effect of magnetic force can be observed.
- Draw magnetic field of a bar magnet using iron filings.
- Recognize Earth's magnetic field which attracts a freely-pivoted magnet to line up with it.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 10

**Topic:** Magnetism

### Subtopics:

- Magnets and Magnetic Field
  - Properties of magnetic field
  - Another way of exploring magnetic field
- Induced and Permanent magnets
  - Induced magnets
  - Permanent magnets

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To give clear concept of the topic.
- To explain in detail types and working of magnets.

### Learning Outcomes:

- Recognise that a freely moving magnet comes to rest pointing to a North-South direction.
- Recognise that there is a space around a magnet where effects of magnetic force can be observed.
- Draws magnetic field of a bar magnet using iron fillings.

### Resources:

- Textbook (NAS Book 6)
- Charts

### Starter Activity (5 min)

Ask some questions randomly. For example:

- What keeps the fridge door on hold?
- How are decorations kept on hold on the fridge door?
- What keeps the room doors open?
- Write the response on the board.
- Show some magnets of daily use at homes, etc.

### Lesson Methodology (30 min)

- Ask students to open their books to assigned page numbers and read silently.

## Teacher Ideas

- Loud reading will be done by the teacher.
- Explanation will be done. Magnets can be used to elaborate further.
- A quick analysis will be given at the end.

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

Ask students to do Quick Review on page # 111 and some relevant questions of Unit Review.

**Home learning**

- Ask students to study the topic for revision.
- Make a list of three uses of magnets in everyday life.

**Lesson Evaluation**

- Ask students to attempt worksheet # 1.

**Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 10

**Topic:** Magnetism

### Subtopics:

- Compass
- Electromagnet
- Using Electromagnets
- Making Magnets
- De-magnetising Magnets

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term :** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To explain in detail the electromagnets and uses of electromagnetism in daily life.
- To make student aware of the important tools used since ancient times to find directions.

### Learning Outcomes:

- Recognise that electric current has a magnetic field around it and it can be verified using a magnetic compass.
- Describe how to magnetise a magnetic material.
- Describe how to demagnetize a magnetic material.
- Construct an electromagnet and identify its applications in everyday life.
- Compare different types of magnets( permanent, temporary and electromagnets).
- Recognise Earth's magnetic field which attracts a freely pivoted magnet to line up within.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Modern train model/poster Maglev train (Ref. page no. 114).

### Starter Activity (10 min)

- Place the poster on the class board.
- Ask students to how Maglev train is known for its speed? How it is run? Is it a fuel run train or electric?

## Teacher Ideas

- Write the correct response on the board.
- Show the compass to the class.

**Lesson Methodology (30 min)**

- As the lesson begins, ask students to open their books to assigned page numbers. Read silently.
- Teacher will do loud reading.
- Explanation will follow.

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

Ask students to attempt remaining questions of Quick Review.

**Home learning**

Ask students to study the topic for revision.

**Lesson Evaluation(5 min)**

Ask students to collect pictures of fast running trains in the world. Prepare a poster of 10x10 inches. For display in school.

**Further Notes**

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## Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Q1.** Select the correct option and write:

a. The South and North sides of a bar magnet facing each other. (Repel/Attract)

\_\_\_\_\_

b. The North pole of one bar magnet facing North pole of another bar magnet. (Repel/Attract)

\_\_\_\_\_

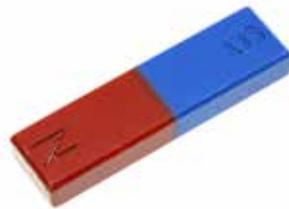
c. The South pole of a bar magnet facing South pole of another bar magnet. (Repel/Attract)

\_\_\_\_\_

**Q2.** Name the given magnets based on their shape.



**a.**



**b.**

**Q3.** Draw a diagram to show what happens when iron fillings are sprinkled on a magnetic bar.

## Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Fill in the blanks.

- a. A ----- is created when electricity flows through an electric wire.
- b. ----- is used for navigation since ancient times.
- c. When a wire behaves like a magnet and attracts same type of material as iron does, it is known as -----.
- d. ----- are useful as they can be turned on/off.
- e. They are used to store ----- in ----- and MRI ----- .
- f. ----- equipment which are used to examine inside of a patient's body.

Q2 .Name any three objects which are run by electromagnets.

- 
- 
-

## Answer Key Worksheet #1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Select the correct option and write:

a. The South and North sides of a bar magnet facing each other. Repel/Attract

**Attract**

b. The North pole of one bar magnet facing North pole of another bar magnet. Repel/Attract

**Repel**

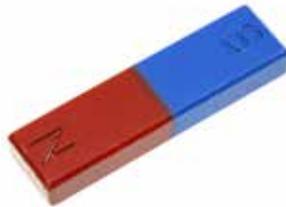
c. The South pole of a bar magnet facing South pole of another bar magnet. Repel/Attract

**Repel**

Q2. Name the given magnets based on their shape.

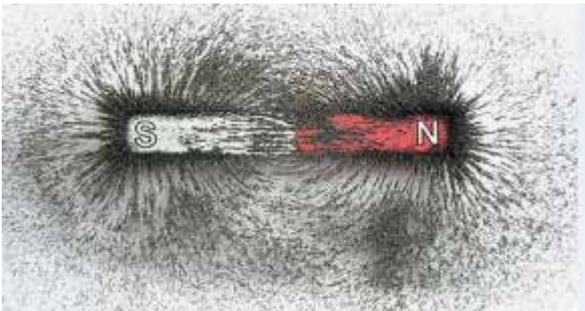


**Horseshoe magnet**



**Bar magnet**

Q.3 Draw a diagram to show what happens when iron fillings are sprinkled on a magnetic bar.



## Answer Key Worksheet #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Fill in the blanks.

- a. A **magnetic field** is created when electricity flows through an electric wire.
- b. **Compass** is used for navigation since ancient times.
- c. When a wire behaves like a magnet and attracts same type of material as iron does, it is known as **solenoid**.
- d. **Electromagnets** are useful as they can be turned on/off.
- e. They are used to store **data** in **computers** and MRI (**Magnetic Resonance imager**) .
- f. **Scanning** equipment which are used to examine inside of a patient's body.

Q2. Name any three objects which are run by electromagnets.

- **Electric Motors**
- **Mangle Car**
- **Earphones**

## Answer key

### NAS book 6

#### Unit 10

#### Quick Review

##### Page 111

1. North
2. North
3. Iron, steel

##### Page 113

- The two will be attracted towards the opposite sides.
- As paper clips are at a distance and not within the magnetic field.

#### Unit Review

##### Choose the correct answer

1.	d.iron in it
2.	b.spins freely
3.	a.electromagnetism
4.	c. current is induced in wire
5.	b. the electrical force is greater at the poles

#### Vocabulary Review

1.	Magnetic field
2.	Iron filing
3.	Magnetic lines of force

#### Observe and Answer

In the diagram the arrows represent attraction between electromagnets of the train and guideway.

As the train runs on current the electromagnetism makes it run on the track. The two has opposite poles as shown in the diagram, so force of attraction is produced.

#### Recall and Analyse

When two bar magnets are suspended, they swing freely. They will align themselves to North and South direction. It is found that same pole of the magnet will always swing towards the magnetic pole of the Earth.

## Recall and Response

**Q1.**

- a. magnetic field
- b. poles
- c. electromagnet
- d. Compass

**Q2.**

- a. False
- b. True
- c. True
- d. False

**Q3**

- a. Electromagnets are very useful because they can be turned on and off.
- b. Iron filings can be used to show the magnetic field around /on electromagnet.
- c. A small plotting can be used to show the lines of magnetic field around an electromagnet.

## Recall and Apply

**Q1.**

### Making of Compass:

Materials:-

Household items including needle, magnet, cork, bowl of water.

Steps:

- Magnetize the needle by stroking it down the length of magnet 50 times.
- Magnetize the other end of the needle with the reverse.
- Prepare the cork by cutting it into a circle about two inches in diameter.
- Insert the needle into the cork.
- Fill a bowl with water.
- Test the compass.

### How it works

Leave the compass with needle spinning freely. It will align with North or South poles. Pointing towards the North pole.

**Q2.**

Put a small piece of masking tape on one end of a bar magnet. Tie a string around the middle of the bar magnet. Dangle the magnet from the string and then from a ruler. Watch as one end orients itself toward the North. This is the magnet's North pole.

### SUBTOPICS

- Differentiate between the characteristics of different planets.
- Describe the characteristics of asteroids, meteorites and comets.
- Describe the uses of various satellites in space, i.e. geostationary, weather, communication and Global Positioning System (GPS).
- Investigate how artificial satellites have improved our knowledge about space and are used for space research.
- Differentiate between planets and dwarf planets.
- Inquire into the sighting of Halley's Comet; describe what they would feel if they saw it.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 11

**Topic:** Solar System

### Subtopics:

- Introduction
- Dwarf Planets
- Planets
- Inner Planets
- Outer Planets
- Asteroids
- Stars
- Looking Through a Telescope
- Mercury
- Venus

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objective:

To gain knowledge of various objects in our solar system and how they are different from each other.

### Learning Outcome:

- Differentiate between different planets.

### Resources:

- Textbook (NAS Book 6)
- Charts/ models -Solar system

### Starter Activity (5 min)

Place a poster of solar system on the board, covering its labels. Ask following questions:

- What is shown?
- What are the objects orbiting the sun?
- Name the planets of the solar system in right order.

### Lesson Methodology (30 min)

- As students engage, ask them to open their books to assigned page number and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.

## Teacher Ideas

- Explanation of solar system will be done. Charts and models will be used effectively.
- A quick analysis of the topic will be given.
- Plan a trip to local Planetarium.

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (5 min)**

Ask students to attempt Quick Review on page number 124 and some relevant questions of Unit Review.

**Home learning**

- Ask students to study the topic for revision.
- Ask them to draw and label a diagram of solar system and label it.

**Lesson Evaluation**

- Ask students to attempt worksheet 1.

**Further Notes**

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## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 11

**Topic:** Solar system

### Subtopics:

- Earth's surface
- Satellite
- Observing the Earth from a satellite
- Benefits of Space Satellite
- Meteorites
- Comets

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To discuss the topic especially focusing on usage of space technology.
- To explain natural objects roaming about in space, besides planets, e.g., comets.

### Learning Outcomes:

- Describe the characteristics of meteorites, asteroids and comets.
- Describe the uses of satellites in space, i.e. geostationary, weather, communication and Global Positioning System(GPS).
- Investigate how beneficial satellites have been in improving our knowledge and how useful they are in space research.
- Inquire into citing of Halley's comet and describe how would they feel if they saw it.

### Resources:

- Textbook (NAS Book 6)
- Charts
- Video: Link <http://youtube/RLW3VLK3Y2KBqoo>

### Starter Activity (5 min)

- Recall students' previous knowledge by asking some questions. For example:
  - What is a satellite?
  - Have you seen satellites?
  - Can you differentiate a satellite from a star on the night sky?

## Teacher Ideas

### **Lesson Methodology (30 min)**

- Ask students to open their books to assigned page number and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation of the topic will be done, using the resource material.
- Arrange and show a video on the topic. Link: <http://youtube/RLW3veKBq00>

### **Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

### **Assessment Opportunities (30 min)**

Ask students to attempt remaining questions of Unit Review.

### **Home learning**

Ask students to study the topic for revision.

### **Lesson Evaluation**

Ask students to attempt worksheet number 2.

### **Further Notes**

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## WORKSHEET 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Draw and label the solar system.

Q2. Complete the following :

- i. The inner planets are namely \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- ii. The outer planets are namely \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
- iii. \_\_\_\_\_ is the largest planet in our solar system.
- iv. Life is only possible on \_\_\_\_\_ due to \_\_\_\_\_ of oxygen.
- v. Pluto is a \_\_\_\_\_ planet.

## WORKSHEET 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q Identify the following pictures.



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

**Q2. Complete the following:**

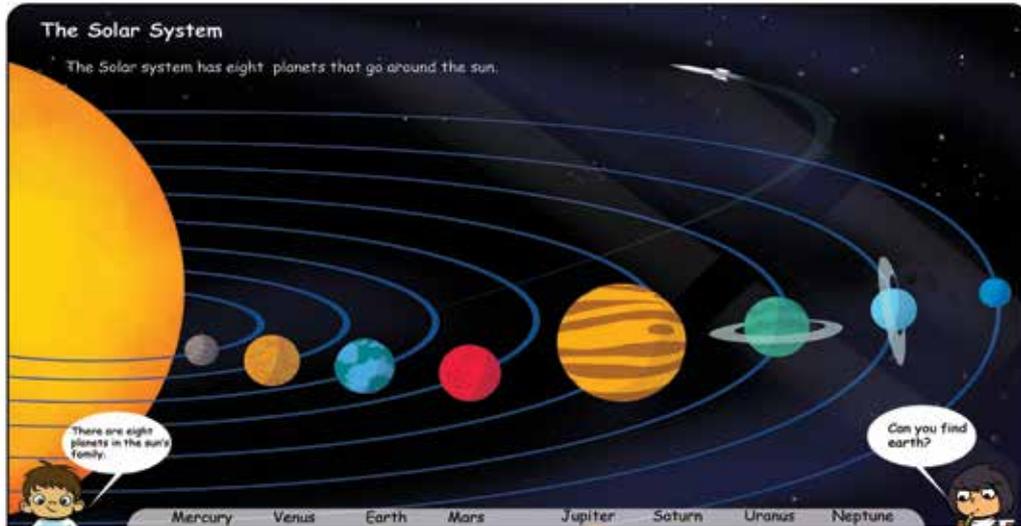
- GPS means \_\_\_\_\_.
- A meteorite is made up of \_\_\_\_\_ or \_\_\_\_\_
- Comets orbit around the \_\_\_\_\_.
- Our cars have \_\_\_\_\_ devices, which are for tracking
- Comet Shoemaker Levy 9 crashed into \_\_\_\_\_ in 1994, breaking down into 20 fragments.
- \_\_\_\_\_ have long tails made up of gases when passing close to the Sun in their orbits.

## Answer key Worksheet 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Draw and label the solar system.



Q2. Complete the following :

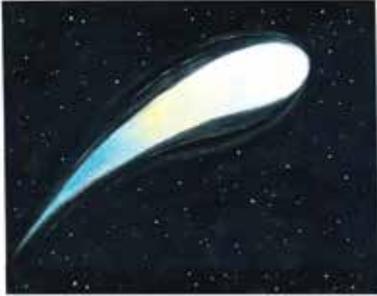
- i. The inner planets are namely *Mercury, Venus, Earth* and *Mars*.
- ii. The outer planets are namely *Jupiter, Saturn, Uranus* and *Neptune*.
- iii. *Jupiter* is the largest planet in our solar system.
- iv. Life is only possible on *Earth* due to *presence* of oxygen.
- v. Pluto is a *dwarf* planet.

## Answer Key Worksheet 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q. Identify the following pictures.



comet



satellite



meteorite

Q2. Complete the following:

- GPS means Global Positioning System.
- A meteorite is made up of **rock or iron** .
- Comets orbit around the **Sun**.
- Our cars have **GPS** devices, which are for tracking
- Comet Shoemaker Levy 9 crashed into **Jupiter** in 1994, breaking down into 20 fragments.
- Meteors have long tails made up of gases when passing close to the Sun in their orbits.

## Answer key

### NAS book 6

#### Unit: 11

#### Quick Review

Q.

1. Sirius is a massive star, twice as large in comparison to our Sun.
2. We can see the planets with the naked eye. However, we can closely see them with telescope.
3. Planets seem to wander about the stars as there is force of attraction between them in their particular solar systems.

They also seem to move across the sky along with the stars as Earth also rotates on its axis.

#### Unit Review

#### Choose the correct answer

1.	a.rocky planets
2.	a.Temperature
3.	b. Venus
4.	a.artificial satellite(if sent from Earth)
5.	a.Sirius

#### Vocabulary Review

1.	Comets
2.	Moon
3.	A celestial body moving in an elliptical orbit around a star.

#### Observe and Answer

The reason for the structure of moon is collision of asteroids and meteorites.

The patches of the moon are called **Lunar Maria**.

#### Recall and Analyse

Q.

1. The solar energy provides light and heat which is vital for life. Without light and heat life is not possible on the planet.
2. The four planets closest to the sun are rocky planets, as they have rocky surfaces and are smaller in size. The outer planets are often called gaseous planets. They are massive and are so cold that gases are often compressed into liquid or solid state.

3. Sun is about 330,000 times massive than the Earth.
4. It takes 165 Earth years to orbit the Sun or 165 times longer than the Earth.

### Recall and Response

1.
  - a. The satellites takes **24** hours to make one orbit of the Earth. So it makes **one** orbit a day. The Earth spins around **once** a year.
  - b. All the planets including Earth go round the Sun. We say they orbit the Sun. The Sun and all the planets make up the **Solar System**.

2.

- a. True
- b. True
- c. True
- d. True
- e. False.

It is made up of Carbon Dioxide.

### Recall and Apply

Q.

1. The gravity binds every binds every thing together so if it suddenly disappears. It will all change. The Satellites will move out of their orbits and will be lost in space.
2. The planets and satellites will continue to move in a straight line at the same speed they were moving. The moment they stopped it will cause them to move away from the original orbit and eventually drift off into space.

### SUBTOPICS

- Grow seasonal plants and vegetables in earthen pots and demonstrate the effect of use of fertilisers on the growth of plants.
- Prepare yogurt and cheese from milk to demonstrate the beneficial microorganisms.
- Design a solar oven to convert solar energy into heat energy.
- Assemble a circuit to demonstrate the working of an electric bell.

## Lesson Plan 1

**Class:** 6

**Subject:** General Science

**Unit:** 12

**Topic:** Technology in Everyday Life

### Subtopics:

- Fertilisers
  - natural
  - artificial

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

To demonstrate/explain useful effects of fertilisers on growth of seasonal plants including vegetables in earthen pots.

### Learning Outcomes:

To grow seasonal plants and vegetables in earthen pots and demonstrate the effect of fertiliser usage on the growth of plants.

### Resources:

- Textbook (NAS Book 6)
- Plants and other material for activity

### Starter Activity (10 min)

Ask students if they would like to start gardening as a hobby. Then share that plants can be grown in earthen pots as well as small spaces in the homes. Also share that fertiliser can be used to improve growth of plants.

### Lesson Methodology (25 min)

- Ask students to open their books to assigned page numbers and read silently. Teacher will facilitate.
- Loud reading will be done by the teacher.
- Explanation of the topic will be done followed by the activity.

### Activity

- To investigate better use of plants with the use of fertilisers.
- Perform the experiment given in the book on page # 131.
- At the start of the experiment ask students to record their observations/data weekly till last observation. At the end of the experiment students will show their observations and discuss the results.

## Teacher Ideas



## Lesson Plan 2

**Class:** 6

**Subject:** General Science

**Unit:** 12

**Topic:** Technology in Everyday Life

### Subtopics:

- How to make yoghurt and cheese
- Making cheese
- Making solar oven
- Designing an electric bell

**Date:** \_\_\_\_\_

**Duration:** 2 x 40

**Term:** \_\_\_\_\_

**Week:** \_\_\_\_\_

### Learning Objectives:

- To demonstrate beneficial effects of microorganisms in food making at home.
- To design new and useful objects to make use of solar energy.
- To make an electric bell with a complete circuit.

### Learning Outcomes:

- Prepare yoghurt and cheese from milk to demonstrate the beneficial organisms.
- Design a solar oven to convert solar energy into heat.
- Assemble a circuit to demonstrate working of an electric bell.

### Resources:

- Textbook NAS 6
- Materials required for the activity as suggested in the unit.

### Starter Activity (10 min)

As students have started working on project 1 in previous lesson, share that there are some more hands on activities in daily life.

### Lesson Methodology (25 min)

- Class will be divided into four groups and each will be given one task from the following:
  1. Making of yoghurt
  2. Making of cheese
  3. Design a solar oven
  4. Prepare an electric bell circuit

## Teacher Ideas

Each group will be assigned one group leader. Teacher will engage other faculty for further assistant (lab assistants).

The teacher will actively coordinate and facilitate.

- The students will silently open their books and read silently from the assigned page numbers.
- Teacher will read loudly.
- Next explanation will follow.
- Each group will be briefed separately and required material will be handed over. Projects will be done.
- At the end, a class exhibition could be arranged and seniors could be invited over.
- At the end, teacher will give her analysis.

**Plenary (5 min)**

- Quick PMI chart (Plus, minus, interesting) will be filled.

**Assessment Opportunities (30 min)**

Completion of activities will help assess success of the activities.

**Home learning**

Ask students to briefly write a report on the activity they performed.

**Lesson Evaluation (5 min)**

The active participation of students and end result will ensure success.

**Further Notes**

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## WORKSHEET 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Tick whether True or False.

Statement	True	False
Probiotics are harmful for us.		
In order to make food like yoghurt, instructions must be followed.		
Lactose is present in milk.		
Earthen pots are not good for plant growth.		
Solar oven work by electric energy.		

Q2. Draw a diagram of an electric bell.

## WORKSHEET 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Fill in the blank.

1. \_\_\_\_\_ healthy and stay \_\_\_\_\_.
2. \_\_\_\_\_ foods are healthier.
3. Buying yogurt from market in \_\_\_\_\_ cups and bags is harmful.
4. Banana peels and egg shells can be used at home to make \_\_\_\_\_.

Q2. Match the following to its correct answer.

Technology has made our lives
Baking requires the use of
Great meals can be cooked using
We can conveniently make this at home

Oven
Easier
Electric bell
Solar oven

## ANSWER KEY WORKSHEET 1

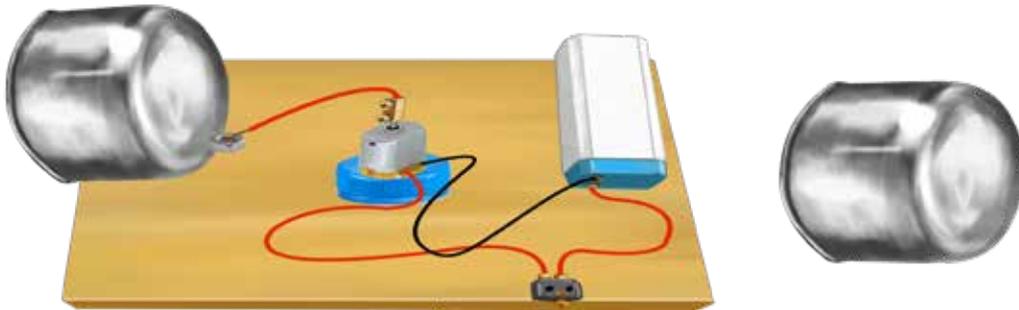
Name: \_\_\_\_\_

Date: \_\_\_\_\_

Q1. Tick whether True or False.

Statement	True	False
Probiotics are harmful for us.		✓
In order to make food like yoghurt, instructions must be followed.	✓	
Lactose is present in milk.	✓	
Earthen pots are not good for plant growth.		✓
Solar oven work by electric energy.		✓

Q2. Draw a diagram of an electric bell.



## ANSWER KEY WORKSHEET 2

Q1. Fill in the blank.

1. **Stay** healthy and stay **safe**.
2. **Homemade** foods are healthier.
3. Buying yoghurt from market in **plastic** cups and bags is harmful.
4. Banana peels and egg shells can be used at home to make **natural fertilisers**.

Q2. Match the following to its correct answer.

Technology has made our lives _____	/	Oven
Baking requires the use of _____	/	Easier
Great meals can be cooked using _____	/	Electric bell
We can conveniently make this at home _____	/	Solar oven