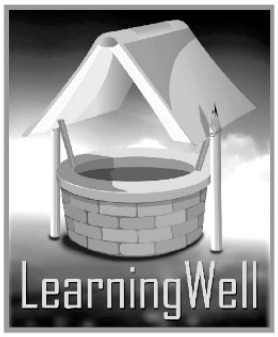

Right Science

3

Teacher's Resource Book

For Order : 0320-5899031

info@learningwell.pk www.learningwell.pk

CONTENTS

Chapter 1: Science
Science is all around 1.1

Learning Objectives
After this lesson, students will be able to

- Determine the scope of science
- Define Science
- Observe things scientifically

Teacher Starter
Start by asking children how can they imagine a world without science? Give them the understanding that science extends beyond the classroom. Also explain how science help us in our everyday life. Give them an understanding that science is more than facts and laws.

Teaching
Get the lesson read in class, emphasizing more on use of science in our everyday life. Tell them a basic idea of science (i-e a process of discovery that help us in connecting the facts and finding new things). You can explain to them about how scientifically developed machines work. Tell them why science is important in creating such machines which help us in various ways.

Extended Teaching
Resources at www.learningwell.pk
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Web Resources:
For further information visit these sites and links:
1. www.teach-nology.com
2. **www.desktopclass.com**

Test your knowledge
Fill in the blanks

1. Discovery
2. Observation
3. Discovering
4. Color, feels, grows, smells
5. Universe

Think and Write

Answer the given questions

1. What is science? What comes to your mind when you hear the word science?

- Science is a constant process of learning and it cannot stop. Science is a process of discovery that helps us in connecting fact and laws listed in the textbook to the real world to understand the natural world around us. Science helps us discover amazing things present in the universe and how they work. How the world was in the past and how it's going to be in the future.

2. Why science is important for us?

- Science is a way of helping the brain grow in finding new knowledge and helps us defeat our curiosity of how the world develops and works today. Science is important because it has helped form the world that we live in today.

3. Where can we find science?

- Science is everywhere. We can find science inside our body, outside our body, in our homes, in our environment, in our school and play ground, inside and outside of our home planet Earth. Everything which we see, hear or feel is all about science.

Words	**Meaning**
Chemical	*a distinct compound or substance, especially one which has been artificially prepared or purified*
Bubbling	containing bubbles
Laboratories	a room or building equipped for scientific experiments, research, or teaching
Discover	find unexpectedly
Healthy	in a good physical or mental condition; in good health.
Crops	a cultivated plant that is grown on a large scale commercially
Investigating	carry out research or study into (a subject or problem, typically one in a scientific or academic field).
Research	the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions
Observation	the action or process of closely observing or monitoring something or someone
Scientist	a person who is studying or has expert knowledge of one or more of the natural or physical sciences.

Concept Maps 1.2

Learning Objectives
After this lesson, students will be able to

- Make the concept (mind) maps.
- Determine the Shapes which are used in a concept map

Teacher Starter
You can start your class by giving them the basic idea of concept maps and how do we put things in graphics in order to understand them better.

Teaching
Get the lesson read in class, emphasizing more on use of science in our everyday life. Let the students understand by giving them various examples that how science answers our questions. By giving some examples, allow them to understand that it is easier to understand things graphically, by knowing they would understand what the concept map is and how it can be used to understand things better.

Extended Teaching
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Think and Write

Answer the given questions
1. What is a concept map?

- Concept means an idea and a map is a picture that shows location of things, and helps you in getting there. So, concept map is a picture used for showing where different parts of an idea or knowledge fit in.

2. 2. Draw shapes that we use in a concept map?

Following are some shapes that can be used in a concept map:

To join and make connection between ideas or shapes we use following lines or arrows:

3. How the concept map is helpful to us?

- Concept maps make it easier to understand stuff. Concept map is a way of explanation through graphics. Concept maps are graphical tools for organizing and representing knowledge in a simpler way.

Test Your Knowledge

A. Concept map

- Do as directed

B. Fill in the blanks

1. Graphical
2. Concept map
3. Bigger
4. Linking words

Words	**Meaning**
Arrow	a symbol used to show direction
Circle	a round plane figure
Concept map	A concept map or conceptual diagram is a diagram that depicts suggested relationships between concepts.
Graphical tools	symbols and shapes that are used to draw a concept map
Linking words	used in concept map to show the connection of symbols or shapes
Symbols	a mark or character used as a conventional representation of an object
Tool	a device or implement, especially used to carry out a particular function

Chapter 2: Our Body
Knowing Vital Organs 2.1

Learning Objectives
After this lesson, students will be able to understand about

- The vital organs
- How organs formed
- Internal organs
- External Organs

Teacher Starter
Start by asking children about their body make up. Tell them your body has different organs each of them has a specific job. Also let them aware that there are two types of organs, internal and external organs. Get the lesson read in class. Enlighten them about the vital organs.

Teaching:
Get the lesson read in class and clearly keep the scope of the chapter to science in the human body. Tell your students about cells, tissues, organs and organ system. Point to the picture of the different organs given in the chapter; tell them about importance of all organs and their functions in detail.

Extended Teaching
Resources at www.learningwell.pk
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1. www.nat.geokids.com
2. www.ducksters.com

Think and Write
Answer the given questions:
1. What are organs?

- Cells combine to form a tissue. Two or more types of tissues combine to form an organ which has a specific task to perform. For example; the heart pumps blood through our body.

2. 2. What does your liver do?

- The liver performs multiple tasks in our body. It produces a chemical called bile which helps in digesting fat found in our food. Liver purifies blood and removes harmful chemicals. It

stores food, produces antibodies that kill bacteria, provides glucose for the brain and produces a protein that stops small cuts from bleeding.

Internal Organ	External Organ
Located inside the human body	Located outside the human body
Invisible	Visible
Examples are Heart, Lungs, Kidneys and Liver etc	Examples are Nose, Eyes, Ears and Tongue etc

3. Write two differences between internal and external body organs.

4. Why is heart the most important organ of our body?

- Heart is the very important organ of our body. If heart stops we will die immediately. Heart's job is to pump blood to all parts of our body. For a long and healthy life take good care of your heart. Physical activity is a pre-requisite for a healthy heart.

5. How many sides are there in the heart? What is their function?

- The heart has two sides: The left side pumps pure blood to the body, the right side pumps impure blood to the lungs so that it can be cleaned.

Test Your Knowledge

A. Read each riddle and fill in the blank with the correct part of your body.

1. Heart
2. Brain
3. Stomach
4. Lungs
5. Kidneys

B. Circle the right answer

1. Lungs
2. Organs
3. Stomach
4. Brain
5. Internal organs
6. Pump the blood

Words	Meanings
Bile	Bile or gall is a dark green to yellowish brown fluid, produced by the liver
Brain	The brain is an organ that serves as the center of the nervous system.
Excrete	to separate and eliminate or discharge waste
External organs	an external organ is any that is outside the body.

Liver	The liver is a large, meaty organ that sits on the right side of the belly
Internal organs	an internal organ is any that is inside the body.
Kidney	The kidneys are two bean-shaped organs located just below the rib cage,
Lungs	The lungs are a pair of spongy, air-filled organs located on either side of the chest
Stomach	The stomach is a muscular organ located on the left side of the upper abdomen.

Knowing Senses 2.2

Learning Objectives

After this lesson, students will be able to understand about

- Senses
- The organs of sight. Smell, taste, hear, and touch.

Teacher Starter & Teaching

Start by asking children about their body make up. Get the lesson read in class. Enlighten them about the organs of senses. How they help us in experience different things around us. How vital each of these for our survival and well-being.

Extended Teaching

Resources at www.learningwell.pk

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Test Your Knowledge

A. Which set of senses are mentioned in the following sentence? I went outside and felt the cool breeze on my skin and smelled my neighbour frying samosas.

- Answer: C. touch, smell

B. True and False

1. True
2. False
3. True
4. False

Think and Write

A. Answer the given questions

1. When you wake up in the morning, what are the first things you see? Hear? Smell? Touch? Taste?

- Note: Student will give this answer by them
  For Example: First thing, I
  See: Table Clock
  Hear: Alarm
  Touch: Blanket
  Smell: Shampoo
  Taste: Breakfast

2. What can we do with our senses? Why do we need our senses?

- Sight, hearing, smell, taste and touch are our five senses. We enjoy all the things around us because of these senses; they make us aware of the world.

3. How our eyes help us see things?

- You see many things because light rays bounce off and enter your eyes. The lens in the eye collects these light rays and focuses them on the retina. The retina is the back surface of the eyeball. From retina, the sight receptors send this image to the brain. The brain then makes you aware.

4. How can your sense of smell keep you safe?

- There are smell receptors in our nose. These receptors detect the odour particles present in the air and generate signals. Brain reads these signals and tells that it is safe for us or not after recognises the smell.

5. How do sounds reach the brain?

- The sound waves are collected by the outer ear. Outer ear directs them to the eardrum. The eardrum then vibrates making a group of three tiny bones called Osicles. Osicles magnify these vibrations and pass them to the inner ear. The innermost part of the ear generates a signal and sends it to the brain. The brain makes sense of the sound and makes us aware.

6. How do taste buds work?

- When you put food into your mouth receptors present in taste buds, react with the food and generates signals for the brain. The brain then works out what we taste.

Words	Meanings
Cilia	cilia of the **nasal** cavity, are the microscopic cellular strands
Ear drum	the membrane of the middle ear, which vibrates in response to sound waves
Inner ear	The **inner ear** is the innermost part of the **ear**, which consist of the cochlea, the balance mechanism, the vestibular and the auditory nerve
Outer ear	The **outer ear**, **external ear,** is the **external** portion of the **ear**, which consists of the pinna and the **ear** canal
Receptors	The receptors of the ears are **hair** cells, which are located in the inner ear.
Retina	The **retina** is a thin layer of tissue that lines the back of the eye on the inside.
Sensors	Humans have **five** basic senses: touch, sight, hearing, smell and taste.
Taste buds	sensory organs that are found on your tongue and allow you to experience **tastes**

Healthy Eating 2.3

Learning Objectives

After this lesson, students will be able to understand about

- Nutrients
- Macro and Micro Nutrients
- Balanced diet
- Food choices for healthy eating

Teacher Starter & Teaching

Start by asking children questions related to eating. You can ask how we get the necessary energy to do different task. There you could give them the concept of nutrients. You can also describe by giving various examples from the book as well as the others. So they could have an idea of macro and micro nutrients. At last you could describe them what food choices should we made in order to get a balanced diet and healthy eating.

Extended Teaching

Resources at www.learningwell.pk

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2. www.ducksters.com

Test your knowledge

A. Write whether the following statements are True or False.

1. False
2. True
3. True
4. True

B. Circle the correct answer

1. Fats
2. Protein
3. Vitamin A
4. Both a and b
5. Nutrients

Think and Write

A. Answer the following questions.

1. What is meant by healthy food?

- Healthy food means a food which is good for our health. Healthy food contains carbohydrates, proteins, vitamins and minerals that we need to remain healthy and active such as milk, cheese, yogurt, fruit, meat and vegetables etc.

2. Why should we need to have healthy food?

- Healthy foods keep us fit and strong. They provide us all nutrient that our body needs.

3. Name five micro-nutrients?

- Vitamins and minerals are also known as micro-nutrients. Name of five micro-nutrients are vitamin (A, B, C, D & E), Calcium, Iron, Zinc and Potassium.

4. Why calcium is important for us?

- Calcium is found in milk and leafy and green vegetables. It makes our bones and teeth strong.

5. How many types of nutrients are their?

- There are two types of nutrients: macronutrients and micro-nutrients.

B. Write short notes on:

1. Carbohydrates
2. Fats
3. Vitamin and minerals

Carbohydrates

Carbohydrates are the quickest source of energy for our body. They are easily digested and broken down to produce glucose which our body uses to do various jobs. Most of the food we eat contains carbohydrates. Grains, breads, rice and cereals all contain large amount of carbohydrates.

Fats

Fats are a rich source of energy for the body. Fats also help our body use some important vitamins. Fats also keep our skin and hair healthy. They keep us warm in cold weather. Fat is found in butter, cheese and walnuts etc. Since fat gives a lot of energy therefore we only need a moderate amount of fat in our diet for good health. Extra fat gets stored in our body and may cause health problems.

Vitamin and Minerals

Vitamin and Minerals are required in very small amount by our body, yet they are very critical for our health. They are mainly found in fresh fruits and vegetables. Some important vitamins are vitamin A, B, C, D and E. Just like vitamins, minerals also help our body to grow, develop and stay healthy. Calcium, iron, zinc and potassium are some minerals that we get from the food we eat.

Words	**Meaning**
Calcium	Calcium is a mineral that is necessary for building bones and keeping them healthy,
Carbohydrates	Carbohydrates are one of the basic food groups we get it from sugars, starches and fibers found in fruits, grains, vegetables and milk products.
Fats	Fat is a type of nutrient. Fats give you energy and help your body absorb vitamins.
Healthy eating	A healthy diet is a diet that helps to maintain or improve overall health.
Infection	Infection is the invasion of an organism's body tissues by disease-causing agents,
Nutrients	Nutrients are compounds in foods essential to life and health.
Protein	Proteins are amino acids that are essential for our bodies to function properly.
Vitamins and minerals	Vitamins and minerals are compounds necessary for the healthy functioning of our bodies.

Chapter 3: Living Things
Food Chain gets food for everyone 3.1

Learning Objectives

After this lesson, students will be able to determine what are

- The Food Chains
- The main parts of a food chain
- Producers, consumers, decomposers
- The herbivores, carnivores and omnivores.

Teacher Starter

You can start the lesson by pointing out what the students learned in the previous chapter about food and nutrients. Ask the students where do we get our meat from? And by what means these animals get their energy from. This way you can explain them that sun is the primary source of energy and plants store this energy, and all the living organisms derive energy either by consuming plants or by consuming other animals.

Teaching

Get the lesson read in class. Emphasize on the topic 'Food Chain'. Point to the pictures given in the unit so that students get the idea to name and identity different living organisms as producers, consumers, decomposers.

Extended Teaching

Resources at www.learningwell.pk

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Web Resources:

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2. https://en.m.wikipedia.org

Test Your Knowledge

Fill in the blanks

1. Herbivores
2. Carnivores
3. Producer
4. Omnivores
5. Decomposers

Put the 11 following living organism into their proper categories.

Producers	Consumers	Decomposers
Acorns	Dogs	Ants
Mushrooms	Deer	Worms
Grass	Chicken	
Flowers	Bears	
Carrots		

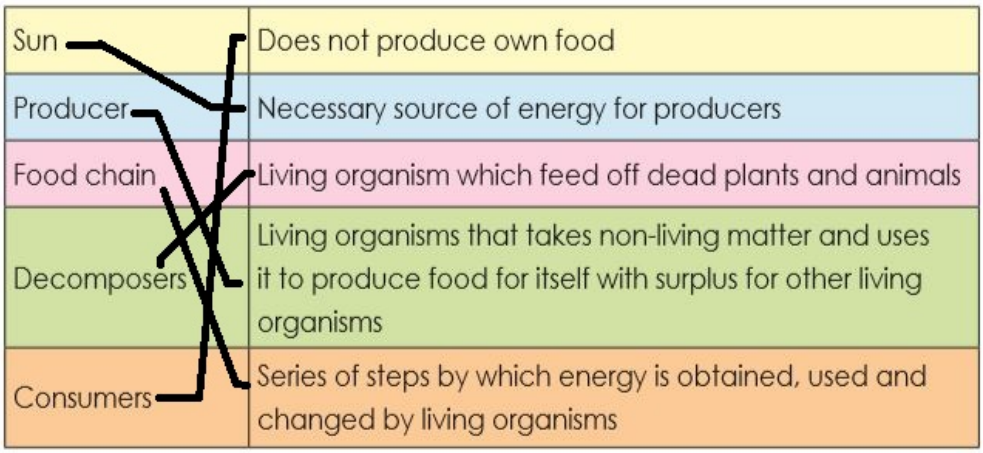
Using any of the pictures on this page, create a food chain.

Sun
↓
Plant
↓
Zebra
↓
Tiger
↓
Flies
↓
Sparrow
↓
Crow
↓
Mouse
↓
Cat
↓
Tiger

Write whether the following statements are True or False

1. False
2. True
3. False
4. True
5. True

Draw a line from a food chain term to its definition



Circle the correct answer

1. Organism
2. Food Chain
3. Decomposers
4. Grass-Hawk-Rabbit

Think and Write

Answer the following questions

1. Explain these terms in detail: Food chain, parts of a food chain.

- A food chain shows how living organisms get their food; and how energy and nutrients are passed from organism to organism. Every time a plant or an animal is eaten, its energy is transferred to the animal that eats it. The way all living organism are connected because of their food is called a food chain.

  Parts of Food Chain

  Every food chain has four main parts: Sun, Producers, Consumers, and Decomposers.

2. Which is the basic part of food chain? Why is it so important?

- Sun is the first and basic part of a food chain. It provides energy to green plants so that they can manufacture their food. Without sunlight, there would be no plants.

3. What is the importance of decomposers?

- Decomposers are a very important part of food chain. They return nutrients to the soil. Without decomposers, the earth would be covered in litter, and the food chain will collapse.

Words	**Meaning**
Consumers	: An organism that ingests other organisms or organic matter in a food chain.
Decomposers	: those organisms' responsible dead animals to decompose.
Food Chain	: a sequence of organisms in an ecosystem in which each species is the food of the next member of the chain

Living Organisms : A form of life

Producers : An organism that produces its own food through photosynthesis or chemosynthesis and constitutes the first trophic level in a food chain; an autotroph.

Scavengers : An animal that feeds on dead or decaying matter.

Science of Plants 3.2

Learning Objectives
After this lesson, students will be able to determine what are

- Plants
- Parts of Plants
- Roots and Stems
- Leaves; Photosynthesis
- Reproductive parts of plants
- Fruits, seeds and Vegetables

Teacher Starter
You can start the lesson by obtaining some plants with you, or just ask the students about how many different parts they observe in a plant. With their observation and your input you can proceed with the chapter.

Teaching
Get the lesson read in class. Tell students about the different parts of plant and the function of each part. Point to the pictures given in the unit so that students get the idea to name and identity different parts of plants.

Extended Teaching
Resources at www.learningwell.pk
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Test Your Knowledge

Fill in the Blanks

1. Seed
2. Sunlight
3. Carbon dioxide
4. Fruit vegetables
5. Edible

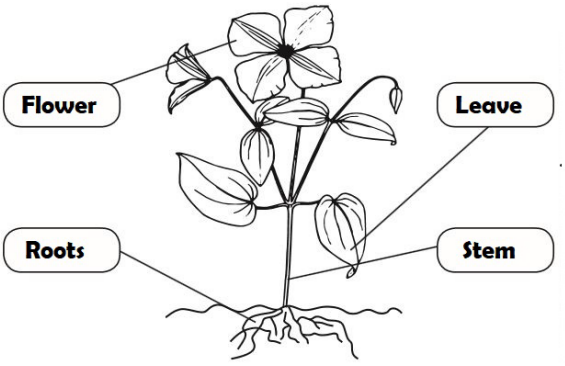
Write whether the following statements are True or False

1. True
2. False
3. True
4. True
5. False

Guess who am I?

1. Seed
2. Flowers
3. Roots
4. Stem
5. Fruit

Draw a plant label it.



Circle the right answer

1. Keeping the plant from blowing away
2. All of these
3. Roots
4. Oxygen
5. Photosynthesis

Think and Write

Answer the following questions

1. Write the basic parts of plants with illustrations?

- Plants are composed of roots, stem, leaves, flowers, fruits, and vegetables. Each part of a plant has an important role to play in its functioning and growth.

(Note: Ask students to draw pictures of them)

2. How do we get fruits?

- Fruits grow from flowers; they are the edible part of the plants. Some common fruits are apples, oranges and mangoes.

3. Why seed are important?

- Seeds are very important part of a plant because seeds are used to grow new plants. Without seed we cannot grow any plants. Seeds also have a food store which provides energy to the embryo. When seeds are buried in the ground and are provided with water and nutrients, their embryo grows into a plant.

4. We eat different parts of plants. Name root, stem, flower and leaves that we eat

- **Roots Vegetable:** Some vegetables are roots of the plant. They are called root vegetables. Carrots, radishes, turnips and beets are part of this group.
  Stem Vegetables: Some vegetables such as celery, sugarcane and asparagus are stem vegetables. They are actually stem of the plants.
  Leaf vegetables: are the leaves of various plants. Spinach, lettuce and chives are examples of leaf vegetables.
  Flower Vegetable: Broccoli, cauliflower, artichoke and moringa are flower vegetables. They are the flowers of their plants.

5. What is the main job of roots?

- The primary job of roots is to suck water and minerals from the soil. They act like drinking straws for the plant. Roots also provide a base for the plant to stand upright.

Words	**Meanings**
Carpels	: the female reproductive organ of flowering plants,
Carbon dioxide	: A colorless, odorless, incombustible gas, CO_2 that is formed during respiration, combustion and decomposition of living organisms.
Embryo	: The collection of cells that has developed from the fertilized egg of a vertebrate animal, before all the major organs have developed.
Fruits	: The ripened ovary or ovaries of a seed-bearing plant, together with accessory parts, containing the seeds and occurring in a wide variety of forms.
Germination	: To cause to sprout or grow.
Leaves	: A usually green, flattened, lateral structure attached to a stem and functioning as a principal organ of photosynthesis and transpiration in most plants.
Organisms	: the formation of chemical compounds by living organisms, either by synthesis or degradation.
Ovules	: A structure in seed plants that consists of the embryo sac surrounded by the nucleus and one or two integuments and that develops into a seed after it is fertilized.
Pollens	: The fine grains contain the male reproductive cells of seed plants.
Photosynthesis	: The process by which carbohydrates are synthesized from carbon dioxide and water, using light as an energy source. Release oxygen as a byproduct.

Reproductive	: characteristic of reproduction
Roots	: The underground portion of a plant that serves as support, draws minerals and water from the surrounding soil, and sometimes stores food.
Seeds	: a mature plant ovule containing an embryo.
Stamen	: The pollen-producing reproductive organ of a flower, usually consisting of a filament and an anther.
Stem	: The main ascending part of a plant; a stalk or trunk.
Tubers	a much thickened underground part of a stem

Life of Plants 3.3

Learning Objectives

After this lesson, students will be able to determine what are

- The life cycle of plants
- photosynthesis
- the needs of plants for growth and reproduction

Teacher Starter

You can proceed with the information they acquire in the previous lesson and ask what the feel common among plants and animals (all living organisms have birth, growth, reproduction in common). Helping them with their answers, tell them that like us, plants also have a life cycle in which they born from a seedling, then into a young plant than adults then they reproduce and eventually die out. Also ask what plants needs to grow. Enlist their answers and conclude.

Teaching

Get the lesson read in class. Discuss the main characteristics of living things. Point to the pictures given in the unit so that students get the idea. Discuss in detail the life cycle of a plant, Also discuss in detail that plants also have a habitat and they also need some habitat in which they live, grow and reproduce.

Extended Teaching

Resources at www.learningwell.pk

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Test Your Knowledge

Fill in the blanks

1. Nutrients
2. Water
3. Oxygen
4. Leaves
5. Chlorophyll

Circle the right answer

1. How organisms grow and change
2. Germination
3. Sun, Water, Air, Soil
4. Photosynthesis
5. Stomata

Think and Write

Answer the following questions

1. What is life cycle of a plant?

- This begins with a seed. The seed germinates and grows into a plant. The plant produces flowers, which produce fruits and fruits have seeds. These seeds fall to the ground or are sown by humans. They grow into new plants. Thus, the life cycle of plants continues to cycle.

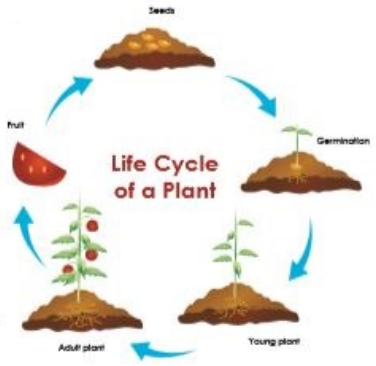
2. How do plants make food? Write complete process with diagram.

- Plants use sunlight, water and air to make their food by the process of photosynthesis. During the process of photosynthesis, plants absorb sunlight through stomata. They use sun light energy to convert water, nutrients and carbon dioxide into glucose. Plants use glucose as food to stay alive and grow.

3. What do plants need to grow?

- Plants need air, water, sunlight, warmth and proper soil to make their food, live and develop. These factors are critical for the growth of a plant.

4. Draw a complete life cycle of a plant.



Words	Meaning
Cactus	succulent plant with a thick fleshy stem which typically bears spines, lacks leaves, and has brilliantly coloured flowers.
Chlorophyll	Chlorophyll is a green pigment found in plants.
Life Cycle	the series of changes in the life of an organism
Oxygen	Oxygen is the chemical element
Stomata	Stomata are tiny openings or pores in plant tissue that allow for gas exchange

Chapter 4: Materials
Materials and their Properties 4.1

Learning Objectives

After this lesson, students will be able to determine what are

- The materials. and their properties
- Classification of different materials according to absorption, transparency, flexibility, Hardness, and conductivity
- The common natural materials (i-e metals, wood, rubber, plastic, glass, paper).

Teacher Starter

You can start with a short activity by presenting different type of materials in front of them and tell your students to classify them according to their absorption, transparency, flexibility, Hardness, and conductivity. Later on you give them an idea about the characteristics of common materials such as wood, rubber, plastic, glass, and paper.

Teaching

Get the lesson read in class and focus on simple materials like metals, wood, rubber, plastic, glass and paper. Then classify them according to their physical properties. Point to the pictures given in the unit to improve student's understanding.

Extended Teaching

Resources at www.learningwell.pk

Log on to your personal account at www.learningwell.pk to view electronic print of this lesson and a full-length video lecture or animation pertaining to the lesson. You will also find extended exercises or MCQ-based tests based on the lesson to help your students improve their learning. Additional teaching resources are also available atwww.TeachingWell.pk

Web Resources:

For further information visit these sites and links:

1. http://en.m.wikipedia.org
2. www.ducksters.com
3. www.thoughtco.com

Test Your Knowledge

A. Match the properties of materials on the left to their meanings on the right:

Hardness	Ability to bend easily.
Waterproof	Ability of materials to let electricity or heat pass thorough them.
Flexibility	Resistance to liquids, repels water
Conductance	Ability of a material to soak up a liquid
Absorbency	Resistance to scratching and pressure, hard wood does not mark as easily as softwood

B. Write five natural materials and five man-mad materials.

Natural Material	Man-Made Material
Wood	Glass
Rubber	Plastic
Iron	Paper
Copper	Synthetic Fiber
Wool	Synthetic Rubber

C. Which would stretch more?

- Wool Sweater

D. Fill in the blanks

1. Materials
2. Natural, man-made
3. Waterproof
4. Hard
5. Latex

E. Circle the correct word/statement

1. Stiff
2. Absorbent
3. Metal
4. Insulator
5. Glass

Think and Write

Answer the following questions

1. What are materials?

- Material is any substance that we use to make an object. We use a wide range of materials in our daily life. Clothes, houses, vehicles, chairs and spoons etc all are made from different types of material.

2. What are the different properties of materials? Explain in detail.

- Different materials have different properties. Here are list of them:
  - Materials that do not let water through and do not soak up water are waterproof.
  - Materials that let water pass through them and soak up water are called absorbents.
  - Materials that let light pass through them are called transparent.
  - Opaque materials do not let light pass through them.
  - Translucent materials let some amount of light pass through them.
  - Flexible materials are easy to bend.
  - Inflexible materials are stiff and do not bend at all.
  - A strong material is hard to break.
  - Weak material is easily broken.
  - Hard materials are difficult to scratch.
  - Soft materials are easy to scratch.
  - A material that lets energy pass through is a conductor.
  - Material that doesn't allow heat and electricity is an insulator.

3. Write down the names of some natural materials with their examples and properties.

- **Metals**
  Metals are strong, hard and shiny. They are obtained from rocks called ores. Metals can be moulded into various shapes. They are used in making tools, coins, cutlery, wires and electrical appliances. Most metals are excellent conductors of heat and electricity.
  Wood
  Wood is obtained from plants and trees. It is strong and hard. It is an insulator. Wood is used in making a lot of useful products such as furniture, paper, toys and pencils.
  Rubber
  Rubber is made from latex which is a runny, milky white liquid that oozes from certain plants when you cut into them. It is mainly used in making tyres, but thousands of other products also use rubber.

Words	Meaning
Absorbents	: agents that take up fluids,
Bulletproof	: capable of resisting the force of a bullet.
Conductor	: a substance that can conduct electricity or heat because it has mobile electrons.
Flexible	: The quality of bending without breaking
Inflexible	: Incapable of being changed; unalterable
Insulator	: A material that insulates, especially a nonconductor of sound, heat, or electricity.

Latex	: The colorless or milky sap of certain plants,
Translucent	: Transmitting light but causing sufficient diffusion to prevent perception of distinct images.
Transparent	: Capable of transmitting light so that objects or images can be seen as if there were no intervening material.
Waterproof	: Impervious to or unaffected by water.

Rocks and Soil 4.2

Learning Objectives

After this lesson, students will be able to determine what are

- The rocks
- Classification of rocks
- Ingenious , sedimentary and Metamorphic rocks
- The soil
- Classification of soil
- Humus, Sand, silt. Clay
- The importance of animals for soil formation

Teacher Starter

You can start your class with a description of different kind of rocks, (this can also be done by displaying a sample of each kind of rock which are available in front of the students). Discuss the traits and properties of these rocks. Also ask them how many different kinds of soils they found around them. Then classify these as sand, humus, silt and clay.

Teaching

Get the lesson read in class and focus on rocks you have presented earlier. Then classify them according to their physical properties. Point to the pictures given in the unit to improve student's understanding. Discuss the types of rocks and give them suitable examples of each type of a rock. Also discuss different types of soil, and how vital the animals are for the formation and mixing of soils.

Extended Teaching

Resources at www.learningwell.pk

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Web Resources:

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1. http://en.m.wikipedia.org
2. www.ducksters.com
3. www.thoughtco.com

Test Your Knowledge

Fill in the Blanks

1. Igneous, Sedimentary, Metamorphic
2. Minerals
3. Heat and pressure
4. Igneous
5. Sedimentary

Write whether following statement are True or False

1. True
2. True
3. False
4. False
5. True

Guess who am I?

1. Igneous
2. Metamorphic
3. Sedimentary

Circle the right answer

1. To make food
2. It has attractive texture and colours
3. A mixture of tiny rock participles, minerals and decayed plant and animal materials
4. Clay
5. Provides food and support for plants

Think and Write

Answer the following questions

1. What do you know about rocks?

- Earth's crust is a thin layer of different types of rocks. Over a long period of time, many rocks change their shape and type due to heat, water, pressure and wind. Rocks are made of one or more minerals. They vary in size. Rocks may be hard or soft.

2. How many types of rocks are there? Elaborate with examples.

Types of Rocks

- There are three main types of rocks: Igneous, Sedimentary and Metamorphic

  Igneous Rocks

  Rocks that are formed by the process of melting and cooling of magma or lava are called igneous or magmatic rocks.

  Sedimentary Rocks

  Sedimentary rocks are made of tiny grains of rock and sand called sediment. Rocks erode and breakdown into tiny sediments. Over time sediments squash together into solid layer of rocks called sedimentary rocks.

Metamorphic Rock

Metamorphic rocks are formed deep inside the Earth when heat and pressure are applied to igneous or sedimentary rocks. The heat and pressure completely changes the form and type of rock.

3. Why animals are important for soil?

- Burrowing animals like moles, rabbits, groundhogs play an essential role in the fertility of the soil. But the most important burrowing creature is the earthworm. Animal tunnel allows the water and air to get into the hard soil. Animal waste also makes the soil fertile.

4. What are the three common types of soils? Write their names and write their properties.

- **Types of Soil**

  There are three commo**n types of soil made from weathered rocks: Sand, Silt, and Clay.**

  Sand

  Sand is made of large particles of rocks; its texture is grainy. Sand does not retain water and nutrients for the plant. Therefore it is not good for the growth of the plant.

  Silt

  The silt is made of rock particles smaller than the sand. It is smooth in texture like flour. The silt can hold water and nutrients; therefore it is ideal for the growth of plants.

  Clay

  Clay is made of very fine particles of rock. It is very sticky when wet and hard when dry. It can hold water and nutrients. Clay do not support plant life.

Words	**Meaning**
Clay	: A fine-grained, firm earthy material that is plastic when wet and hardens when heated,
Igneous	: rocks derived by solidification of magma or molten lava emplaced on or below the earth's surface.
Metamorphic	: rocks altered considerably from their original structure and mineralogy by pressure and heat
Sand	: small or loose grains of worn or disintegrated rock.
Silt	: A sedimentary material consisting of very fine particles intermediate in size between sand and clay.
Sedimentary	: Rocks formed by the accumulation and consolidation of mineral and organic fragments that have been deposited by water, ice, or wind.

Chapter 5: Space
The Solar System 5.1

Learning Objectives

After this lesson, students will be able to determine what are

- The circumstances and processes that led the formation of the solar system.
- The role of the sun as a provider of energy for the Solar system.
- The processes that formed Earth and other planets, Dwarf planets and moons.
- The asteroids, meteoroids and other celestial bodies in the solar system

Teacher Starter

You can start by asking children what is the main source of energy. Where did we get all of our energy from? There you can tell them that Sun is the center and the primary source of all material and energy in the solar system. Then enlighten them about the circumstances and processes that led the formation of the solar system. Let them aware of the fact that it's not the sun which moves but the earth like all the other planets revolve around the sun. Also give them an idea of other celestial bodies like other planets, dwarf planets, moons, asteroids comets and meteoroids.

Start by asking children about earth, planet and our solar system. Also ask them what makes earth so perfect for life? What is atmosphere? And why do we need it. Tell them that a layer of gases surrounds the surface of earth and it is called the atmosphere.

Teaching:

Get the lesson read in class, emphasizing more on the topic 'The Solar System'. Point to the pictures of various planets and compare how long they take to orbit the sun. Also tell them about the relative size of and distance between Earth, other planets in the solar system and the sun. give information about other celestial bodies present in the solar system such as dwarf planets, moons, asteroids and comets.

Extended Teaching

Resources at www.learningwell.pk

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Web Resources:

For further information visit these sites and links:

1. www.sciencedirect.com
2. www.toppr.com
3. www.britannica.com

Test Your Knowledge

Fill in the blanks:

1. Solar system
2. Eight
3. Gravity
4. Heat and light energy
5. Jupiter

Label the diagram

(Note: Starts from upside)

- Neptune
- Uranus
- Saturn
- Jupiter
- Mars
- Earth
- Venus
- Mercury

Circle the right answer

1. Ceres
2. It forms a long tail made of gas and dust
3. A chunk of rock and metal that is orbiting the Sun
4. Expo-planet
5. Gravity

Think and Write

Answer the following questions

1. What is solar system?

- Our solar system consists of the Sun and all the objects that revolve around it. This includes eight planets and their moons. It also contains other space objects such as dwarf planets, asteroids, comets, dust and gas.

2. Write a note about The Sun

- The Sun is the core of our solar system. It is a massive object and contains 97% of all the mass of our solar system. This mass gives rise to a powerful, attractive force called gravity. Like all stars, Sun is a hot ball of burning gases. This burning makes the sun radiate heat and light energy.

3. Define these terms: Planets, Comets, Asteroids

- **Planets**
  Planets are round objects. They revolve around a star. Their movement is called revolution. There are eight planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn,

Uranus and Neptune. All planets have some kind of atmosphere, though Earth's is the only one which is suitable for humans.

Asteroids

Asteroids are chunks of rocks and metals. Most asteroids are found in between Mars and Jupiter. This part of the solar system is called asteroid belt.

Comets

Comets revolve around the sun at the very edge of the solar system, far beyond Neptune. Comets are big chunks of rocks and ice. The most famous thing about a comet is its tail. Though this only forms when it is near the sun and is mostly composed of ice.

4. What do you know about moon? Write about the numbers of moons of other planets.

- A moon is a natural satellite and revolves around a planet. All planets of solar system except Mercury and Venus have different number of moons revolving around them.

Moons around the Planets

Planet	Moons
Mercury	0
Venus	0
Earth	1
Mars	2
Jupiter	67
Saturn	62
Uranus	27
Neptune	14

5. What are dwarf planets?

- Some planets are very small in size. These are called dwarf planets. Pluto is a dwarf planet. The other four dwarf planets of the solar system are Ceres, Eris, Makemake and Haumea.

Words	Meaning
Asteroids	: Lumps of metal or rock in many sizes concentrated in parts of the solar system.
Comets	: A celestial body following long elliptical orbits that bring them from outside the orbit of Pluto, close to the Sun, and then back beyond Pluto.
Earth	: 3rd planet from the sun and the 5th largest, the only planet definitely known to support life.
Jupiter	: 5th planet from the sun and the largest planet,
Mars	: 4th planet from the sun.
Mercury	: 1st planet from the sun.
Neptune	: 8th planet from the sun
Solar system	: the sun and the surrounding planets, natural satellites , dwarf planets, asteroids, meteoroids, and comets that are bound by the gravity of sun.
Satellite	: a celestial body orbiting around a planet or star
Saturn	: 6th planet from the sun. Known for its majestic rings
Uranus	: 7th planet from the sun
Venus	: 2nd planet from the sun, the brightest object in the sky after moon and sun, closest planet from earth.

Chapter 6: Earth Our Home
Earth and its Atmosphere 6.1

Learning objectives:
In this lesson we will learn about

- Planet Earth: our Home
- Earth's atmosphere; a mixture of various gases.
- Earth's Movement
- The Primary Energy Source of our planet
- The Water cycle

Teacher Starters:
Start by asking children about earth; as a planet in our solar system. Also ask them what makes earth so perfect for life? What are the main factors, (atmosphere, Earth's Movement, the Sun, Liquid water and Water cycle) discuss these factors one by one.

Teaching:
Get the lesson read in class, emphasizing more on the topic 'Earth and its Atmosphere'. Point to the pictures of various factors presented in the chapter (that makes our home habitable). Explain each of the factors in detail so the student understands them well.

Extended Teaching
Resources at www.learningwell.pk
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Web Resources:
For further information visit these sites and links:
1. http://kidsgeo.com
2. https://youtu.be/W5teyd8srp8

Test Your Knowledge

Fill in the Blanks

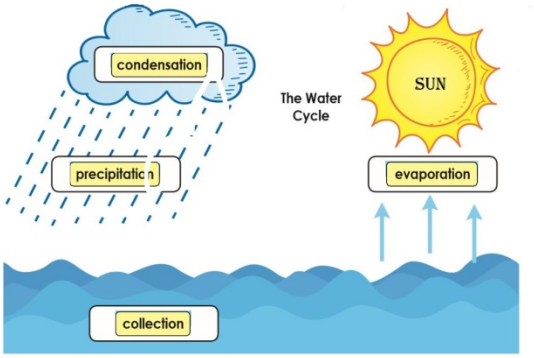
1. 70%
2. Rotation
3. Atmosphere
4. Evaporation
5. Water Cycle
6. Primary
7. Tilt
8. 365 days and 6 hours
9. Ozone
10. Water and the oxygen
11. -rich atmosphere

Write whether the following statements are True or False

1. True
2. True
3. True
4. True
5. False

There is a blank diagram of the water cycle below:

• Fill in the three processes of the water cycle.
• Label the energy source that the water cycle needs in order to begin.



Circle the right answer

1. The tilt of the Earth's axis
2. Earth rotates
3. It protect us from ultra violet radiation
4. Oxygen
5. The Sun
6. Evaporation

Think and Write

Answer the following questions:

1. What is Earth and what are the most important things it has to sustain life?

• The Earth, our home in space, is an exceptional place. It is the only planet of the solar system where life exists. Earth has two main things that humans and other organisms need to survive and flourish: Water and the oxygen-rich atmosphere.

2. What kind of atmosphere do the Earth has?

• Life on Earth would not have been possible without its atmosphere. The air you breathe represents the atmosphere that surrounds the Earth. This life-sustaining mixture of air consists of 78% nitrogen gas, 21% oxygen gas and other gases. A layer of gas called Ozone is present at a very altitude in the atmosphere which protects the Earth from ultraviolet rays.

3. What is the primary source of energy of Earth? Write its benefits and drawbacks.

- Sun is the primary source of heat and light for us. Photosynthesis, water Cycle, Life of Organism and food chain is only possible because of the Sun. But it also emits Ultraviolet (UV) rays. These are harmful to us and may cause skin cancer and damage our health.

4. What is Earth's movement and what happens because of this movement?

- Earth revolves around the sun, just like all other objects of the solar system. Apart from this movement it also rotates on its own axis, this is called rotation or spin of the earth. Earth rotates from west to east and completes one rotation in a day (24 hours). This rotation causes the day and night.

5. What is water cycle? Write the complete process with a labeled diagram.

- The journey water takes as the Earth circulates it from land to the sky and back again is called the water cycle. The process of water cycle includes:

  Evaporation

  When the sun heats up water in a water body (sea, river, lake etc.), it turns into vapours or steam. This is called evaporation.

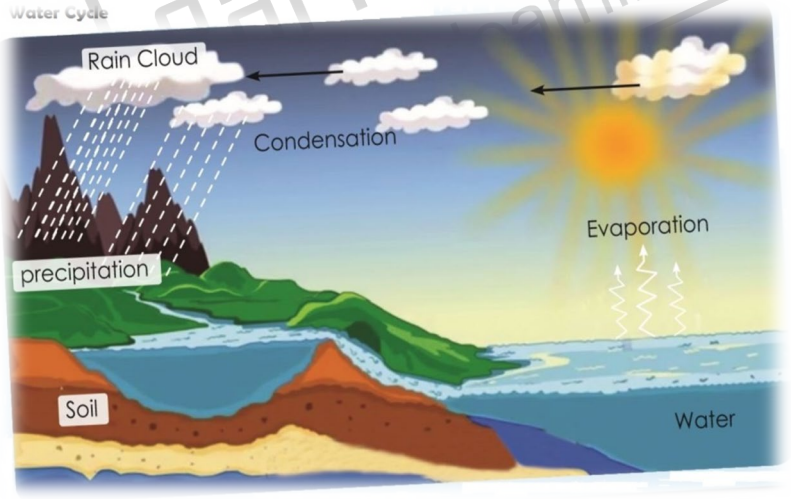
  Condensation

  These vapours rise high in the atmosphere, they cool and turn back into liquid, forming clouds. This is called condensation.

  Precipitation

  When too much water has condensed, the clouds get heavy. And so the water falls back to the land in the form of hail, snow or rain. This is called precipitation.

  The fallen water collects in rivers, lakes and oceans-from where it will eventually evaporate starting the cycle all over again.



Words	Meaning
Atmosphere	: the mixture of gases surrounding our planet
Axis	: Located on, around, or in the direction of
Evaporation	: To convert or change into a vapor.
Humidity	: amount of water vapour especially of the air.
Orbit	: The path of a celestial body as it revolves around another body due to their mutual gravitational attraction.
Ozone	: An unstable, poisonous allotrope of oxygen, O_3 that is formed naturally in the ozone layer from atmospheric oxygen by electric discharge or exposure to ultraviolet radiation.
Revolution	: Orbital motion about a point, especially as distinguished from axial rotation:
Tilt	: An inclination from the horizontal or vertical
Ultraviolet	: the part of the electromagnetic spectrum with wavelengths shorter than light but longer than X-rays;
Vapors	: The gaseous state of a substance that is liquid or solid at room temperature.

Saving Earth 6.2

Learning objectives:
In this lesson we will learn about

- The Balance of Nature (Ecosystem)
- How we damage this ecosystem(Pollution)
- Types of pollution
- The consequences of pollution
- Climate change
- Reducing Pollution, Saving Environment

Teacher Starters:
You can proceed with the previous lesson and emphasize on the point that How unique our planet Earth is. And how vital it is to maintain its balance. Also discuss how we the humans disturb this balance and how do we keep ourselves from damaging the environment.

Teaching:
Get the lesson read in class, Point to the pictures of various effects given in the unit. Discuss the ways in which human beings and their things tend to pollute the atmosphere, also emphasize on the need to reduce as well as to eliminate the adverse effect of human beings onto the environment.

Extended Teaching
Resources at www.learningwell.pk
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Web Resources:
For further information visit these sites and links:
1. http://kidsgeo.com
2. https://youtu.be/W5teyd8srp8

Test Your Knowledge

Write whether the following statements are True or False

1. True
2. False
3. False
4. True
5. True
6. False
7. True
8. True
9. False
10. False
11. True
12. True
13. True

Circle the right answer

1. Pollution
2. Earth's Atmosphere
3. 1800s
4. None of these
5. Both of these

Match each word to the correct definition

Pollution	The conditions that surround an individual; surroundings.
Environment	To protect from loss or harm; to avoid waste
Litter	The area where an organism or a community of organisms lives.
Pollutant	The contamination of soil, water, or the atmosphere by the discharge of harmful substances.
Recycle	Waste material that infects air, soil, or water.
Prevent	To use again; to reprocess
Habitat	Carelessly discarded waste.

What are the effects of pollution on the environment and on the people?

Effects of Pollution on People	Effects of Pollution on Environment
Exposure to such particles can affect both your lungs and your heart. Long-term exposure to particulate pollution can result in significant health problems including: Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing. Decreased lung function.	Along with harming human health, air pollution can cause a variety ofenvironmental effects: Acid rain is precipitation containing harmful amounts of nitric and sulfuric acids. These acids are formed primarily by nitrogen oxides and sulfur oxides released into the atmosphere when fossil fuels are burned.

Think and Write

Answer the following questions

1. What do we mean by saving the Earth? Why do we need to save Earth?

- Saving earth is meant to stop all undesirable activities that make our earth and environment unhealthy. Earth is our home. Earth gives us many things to survive. It provides us air to breathe, water to drink, food to eat and place to live. So it is our duty to take care of Earth. If we do not save Earth's environment; it will become difficult for us to survive on it.

2. What is pollution? What are the causes of pollution?

- The addition of harmful substances to the environment that adversely changes it is called pollution. In other words, pollution means any contamination of air, soil, and water by hazardous substances. These substances are called pollutants. Factories, industrial and domestic waste and bad agricultural practices are the main causes of pollution.

3. How many kinds of pollutions are there? Write in detail with illustrations.

- **Types of Pollution**
  There are mainly four kinds of pollution.
  Land Pollution

When we do not properly dispose of our trash, we contaminate the land. Some of the stuff that we throw away is toxic to our environment.

Water Pollution

Many factories dump harmful chemical wastes and oil in rivers and lakes which eventually reaches sea.

Air Pollution

Polluted air harms the living things badly when they breathe. Harmful gases from factories, automobiles and sprays contaminate the air around us.

Noise Pollution

The loud and unpleasant sound is noise pollution. This is harmful to our ears; it also disturbs our minds.

Words	Meaning
Automobiles	: A self-propelled passenger vehicle that usually has four wheels and an internal-combustion engine, used for land transport. Also called motorcar.
Chemicals	: Of or relating to the properties or actions of chemicals.
Contamination	: the act or process of contaminating or the state of being contaminated
Habitat	: A particular kind of natural environment: woodland and prairie habitats.
Poisonous	: Containing or being a poison
Pollutants	: an unwanted substance that occurs in the environment, usually with health-threatening effects.
Purify	: to get rid of impurities
Trash	: Worthless or discarded material or objects
Yield	: To give forth by a natural process, especially by cultivation

Chapter 7: Sound and Light
Learning about Sound 7.1

Learning objectives:

- In this lesson we will learn about Sound
- We will learn that sound is all around us and we hear different sounds with the help of hearing.
- We will learn that sound waves produced by vibrations need a medium to travel.
- We will learn about the properties of sound.

Teacher Starters:

Start by asking students that how the sound is produced? Also ask them how they recognize sounds and what are the basic properties of sound. Tell them the medium used to create sound. Discuss how to recognize sounds, properties of sound, loudness, pitch, pleasant and unpleasant sound and echo.

Teaching:
Get the lesson read in class focusing on the topic with as many examples as possible. Point to the pictures given in the unit as they demonstrate the various ways in which sound works. Tell students that sound is all around us, and that sound waves are produced by vibrations and they need medium to travel. Tell them about basic properties of sound. Give them related examples.

Extended Teaching
Resources at www.learningwell.pk
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Web Resources:
For further information visit these sites and links:
1. www.theschoolrun.com
2. www.explainthatstuff.com

Test Your Knowledge
Fill in the blanks
1. Pitch
2. Loud
3. Vibrations
4. Wave
5. Noise

Write whether the following statements are True or False
1. False
2. True
3. True
4. False

Circle the right answer
1. Vibrates
2. Louder
3. Hearing
4. Volume
5. Jet plane

Think and Write

Answer the following questions.
1. What is sound? How the sound is produced?

- A sound is a form of energy made by vibrations. Sound is produced when a force causes an object to vibrate. When an object vibrates, it moves back and forth really fast. It is this motion that creates sound.

2. What happens when a sound wave hits the ear drum?
- The sound waves travel through the air and enter into our ears, and we hear the sound.

3. How can you make a drum sound louder?
- A drum hit very hard produces a loud sound.

4. How sound is useful to us?
- We use sounds all the time. Sounds allow us to talk to our friends. It helps us share knowledge and learn new things. Sound also protects us from danger and tell us how to react. We also use sounds for entertainment.

5. What are loud and soft sounds? Explain.
- When an object vibrates faster, it produces a loud sound. When it vibrates slowly, it produces a soft sound.

Light and Shadow 7.2

Learning objectives:
- In this lesson We will learn about light.
- We will learn that light is a form of energy. It is made up of very tiny particles called photons.
- We will learn about transparent, translucent and opaque objects.
- We will learn about natural sources of light and artificial sources of light.
- We will learn the properties of light: Speed, Reflection, and Refraction.

Teacher Starters:
Start by asking students about light and its sources. Tell them about the basic sources of light, including natural light from the sun. Tell them that light has many properties for e.g. Speed, Reflection and Refraction. Perform any experiment related to light, in science lab so it will be easy for them to understand the topic.

Teaching:
Get the lesson read in class focusing on the topic with as many examples as possible. Point to the pictures given in the unit as they demonstrate the various ways. So that students are able to relate various forms of light in their surroundings as well. Tell them that light is a form of energy. It is made up tiny particles called protons. Tell students about light, its sources and its properties in detail. Discuss two major sources of light, Natural sources of light and artificial sources of light.

Extended Teaching
Resources at www.learningwell.pk
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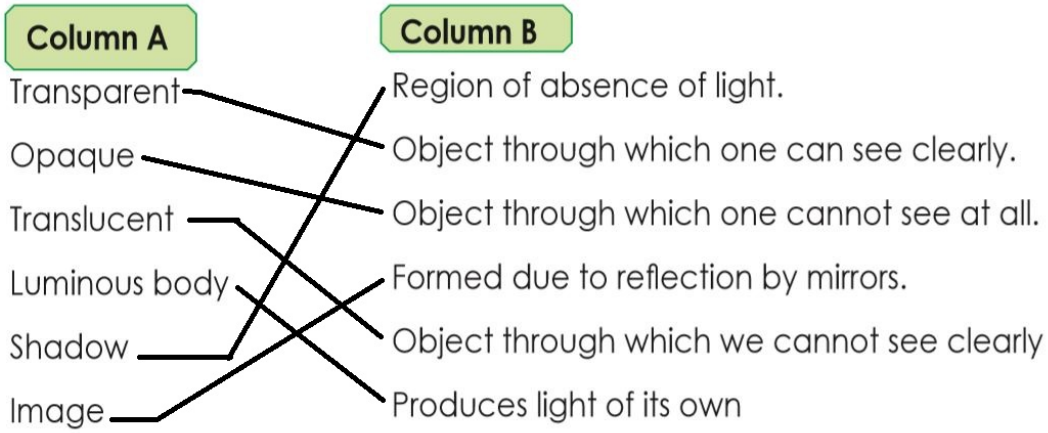
Web Resources:
For further information visit these sites and links:
1. www.theschoolrun.com
2. www.explainthatstuff.com

Test Your Knowledge
Fill in the blanks with appropriate words

1. Translucent
2. Opaque
3. Transparent
4. Non-luminous
5. Bioluminescene

B. Match the words with correct definitions.



C. Short answer questions

1. List four natural sources of light.

- Natural sources of light include the Sun, stars, fire and lightning.

2. Write down four man-made sources of light.

- Artificial sources of light are made by humans such as a flashlight, candle, table lamp, light bulb, and neon signs

.

3. Define luminous body.

- Objects that give off their own light are called luminous objects. They are the light sources.

4. Classify the following into transparent, opaque and translucent objects:

- Wax, spectacles, a heap of salt, a stone, dense smoke, wood, skin, balloon rubber, membrane of a table, blood and milk

Transparent	**Opaque**	**Translucent**
Spectacles	Wax	A heap of salt
Membrane of a table	A Stone	Dense smoke
	Wood	Balloon rubber
	Skin	
	Blood	
	Milk	

Circle the right answer

1. Late afternoon
2. Noon
3. Light
4. The Moon
5. It allows no light to travel through it

Think and Write

A. Answer the following questions:

1. What is light? Write about different sources of light.

- Light is a form of energy. It keeps us warm and helps us see all the things around us. Life on Earth could not exist without light. Light energy comes from two different types of sources; natural and artificial. Natural sources of light include the Sun, stars, fire and lightning. Artificial sources of light are made by humans such as a flashlight, candle, table lamp, light bulb, and neon signs.

2. How do the light travels?

- Light travels in a straight line at a speed of 300,000 km per second! It is not just very fast; it is the fastest moving object in the universe.

3. What is the connection between light and different materials?

- Different materials behave differently to light. There are three types of material according to the way they react to light.
  - Transparent materials let light pass through them. Glass is an example.
  - Translucent materials let a little amount of light pass through them. Frosted glass and butter paper are translucent material.
  - Opaque materials do not let light pass through them. Wood and bricks are examples.

4. What are shadows and how are they formed? Explain with the help of diagram.

- Materials that do not let light pass through them or let a little light pass through, form shadows. When an object comes between a light source and a surface, a dark area develops on the surface. This is called a shadow.

5. What is meant by intensity of light?

- The intensity of light is a technical measure of light which is similar to brightness. In common use, intensity can be used as another name for brightness.

Words	Meaning
Artificial	: Made by humans, especially in imitation of something natural
Brightness	: attribute of an object or colour enabling the extent to which an object emits light to be observed
Intensity	: The strength of a color, especially the degree to which it lacks its complementary color.
Luminous	: an object which emits light
Natural	: by nature
Non-luminous	: an object which doesn't emits light
Opaque	: doesn't reflects light
Shadow	: A dark area or shape made as a result of an object blocking rays of light.

Chapter 8: Electricity and Magnetism
Electric Circuits 8.1

Learning Objectives

In this lesson. We will learn about

- Electricity
- Electric conductors and insulators
- Electric circuit
- Closed and Open Circuits

Teacher Starters:

You can start you class by asking students about electricity, current and circuits. Ask students about machines which are run from electricity. This will create a brainstorming session in them for our use of electricity. You can tell them that electricity is a form of energy, which requires a path (of conductor) to travel. Give them some related examples in home at school. Draw a circuit diagram on board, that will help them to understand about circuits.

Teaching:

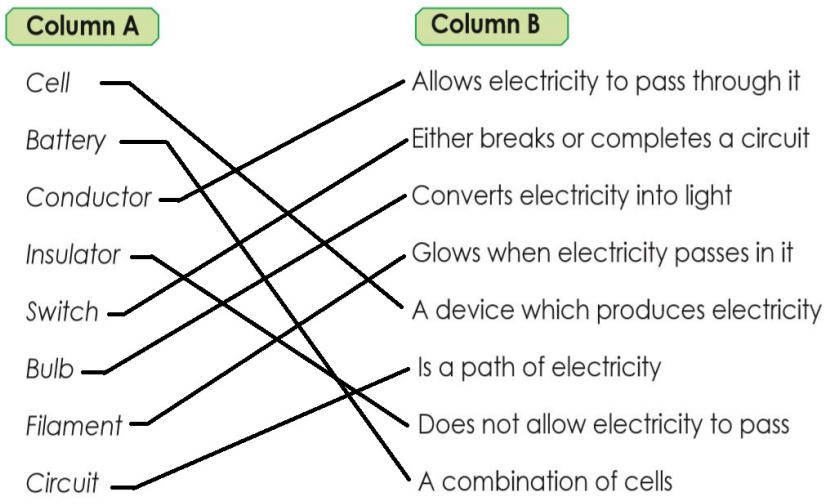
The students here must be clear that use of electricity for machines is only possible through formation of an electric circuit. Point to the pictures of circuits and switches given in the unit so that students get a better grip on the topic. Discuss: open and closed circuit, switches, and types of circuit: Series circuit and Parallel circuit, insulator and conductors. Also tell students they ways to be careful with electricity.

Extended Teaching
Resources at www.learningwell.pk
Log on to your personal account at www.learningwell.pk to view electronic print of this lesson and a full-length video lecture or animation pertaining to the lesson. You will also find extended exercises or MCQ-based tests based on the lesson to help your students improve their learning. Additional teaching resources are also available atwww.TeachingWell.pk

Web Resources:
For further information visit these sites and links:
1. www.soundproofingcompany.com
2. www.behindthemixer.com
3. http://ilearn.careerforce.org.nz

Test Your Knowledge
A. Fill in the blanks
1. Conductors
2. Insulators
3. Good
4. Open circuit
5. Open
6. Electrical Switch
7. Two
8. Electric Circuit

B. Match the following items given in Column A with that in Column B.



C.Whether True or False for following Statements
1. True
2. False
3. False
4. True
5. False

Think and Write

Answer the following questions:

1. What is meant by electricity and how it flows?

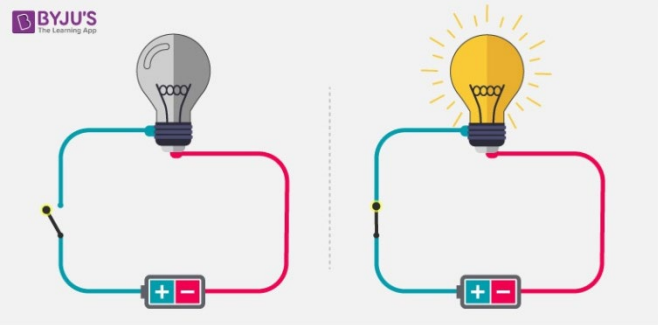
- The electricity moves through wires. When electricity moves from one point to another along a wire, it is called an electric current. An electric current can only travel through a certain type of materials.

2. Define: Conductors and Insulators.

- **Conductors**
  Materials that allow electric current to pass through them are called conductors. Metal and water are conductors.
  Insulators
  Materials that do not allow electric current to pass through them are called insulators. Rubber, wood and plastic are insulators.

3. What is an electric circuit? What things are required to make an electric circuit? Support your answer with illustrations.

- When electric current moves in a metal wire we say that an electric current is flowing through the wire. Two things are needed for an electric current to flow: A source of electricity and a path to flow. Source of electricity could be a battery, a cell or mains supply. A path on which electric current flows is called an electric circuit.



4. How electric current flows through a complete circuit?

- An electric current will flow from one end of the battery along the wire and then through the filament (a thin string inside the bulb) to make it glow and then along the second wire to the other end of the battery.

Words	Meaning
Battery	: A device containing an electric cell or a series of electric cells storing chemical energy that can be converted into electrical energy, usually in the form of direct current.
Buzzer	: An electric signaling device, which produces a buzz sound
Closed Circuit	: a complete electrical circuit in which current flows.
Current	: - a flow of electric charge
Electricity	: the science dealing with electric charges and currents.

Mains	: electric supply source in a circuit
Open circuit	: an incomplete electrical circuit in which no current flows.
Switch	: A device used to break or open an electric circuit or to divert current from one conductor to another.

Magnetism 8.2

Learning Objectives

In this lesson. We will learn about

- Magnets
- Magnetic Materials
- Magnetic Poles
- Magnetic field
- Magnetization
- Uses of Magnets
- The Electric magnet

Teacher Starters:

You can introduce magnets in your classroom and ask the students what makes them push each other away or pull towards each other? How are the magnets made, and what else do magnets stick to? How are magnets made? Upon investigation you help the students learn that a magnet has Observe that magnets has two sides—north and south. Design an activity in which students can predict the motion of magnets, based on knowledge that they repel and attract.

Teaching:

Read the chapter thoroughly and point on the different examples mentioned in the book or you can have your own. Give them an idea about the forces of magnets, before reading each of the topic. Ask students about different words such as magnetic field, magnetic pole, force of attraction, and repulsion. You can aslo let your students determine which objects are magnetic and which are not.

Extended Teaching

Resources at www.learningwell.pk

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Test Your Knowledge

Write whether the following statements are True or False

1. False
2. True
3. True
4. True
5. True
6. False
7. True

Circle the right answer

1. None of the above
2. N-pole
3. Both a and b
4. Poles
5. Compass
6. Repulsion
7. Becomes weaker

Think and Write

Answer the following questions:

1. What are magnets and what is magnetism?

- Magnets are rocks or pieces of metal that pull iron and some other metals towards themselves. This is called magnetism.

2. 2. What are magnetic and non-magnetic materials? Explain with examples.

- Magnets pull some metals such as iron and nickel. They are called magnetic materials. Magnets do not pull or push some materials such as wood, glass or plastic. They are known as nonmagnetic materials.

3. Write about different types and shapes of magnets with pictures.

- Two common types of magnets are the bar magnet and the horseshoe magnet. One of the tips is the North Pole, the other the South Pole. Other shapes of magnets are cylinder, ring, and button magnets.

4. What is meant by magnetic field? Elaborate with diagram.

- All magnets have the maximum force of attraction around their poles. The farther you move the object from the poles the weaker the force of attraction. Poles of a magnet produce an invisible area of force around them which attracts magnetic materials. This area of force is called magnetic field. The bigger the magnet, the stronger the magnetic field

5. What are electromagnets? How can we make an electromagnet?

- Magnets can also be created by using electricity. By wrapping a wire around an iron bar and running current through the wire, powerful magnets can be created. This is called electromagnetism.

Words	**Meaning**
Bar Magnet	: A type of magnet looks like a bar
Electro magnet	: a device consisting of an iron or steel core that is magnetized by electric current in a coil that surrounds it.
Horseshoe magnet	: A type of a magnet looks like a horseshoe
Magnetism	: The study of magnets and their effects.
Magnetic materials	: Those materials which are attracted by a magnet
Magnetic field	: The area around a magnet in which its magnetism can affect other objects
Magnetization	The process of making a substance temporarily or permanently magnetic, as by insertion in a magnetic field.
Non-magnetic materials	: Those materials which are not attracted by a magnet
North Pole	: the northernmost point on the surface of the Earth
South Pole	: the southernmost point on the surface of the Earth