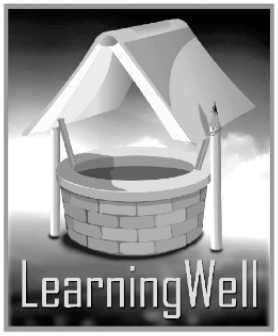

LearningWell's Science

4

Teacher's Resource Book

For Order : 0320-5899031

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Table of Contents

Lesson 1: Science and Its Major Fields

Time required: **360 minutes** or **6 hours** with Activity book and revision of the lesson.

Start this lesson in progression with understanding Science, grade3

Aim of the lesson:

We explained about science in grade three where students already had learnt about animals, plants, humans, materials, and energy and forces. This time we aim to bring their understanding towards fields of science. They will be able to identify major areas of science according to the area of study.

Learning objectives:

In this lesson students will know:

- Science starts with observation and ends at a theory
- Major branches of Science
- Biology: The study of living things.
- Chemistry: The study of mass and matter.
- Physics: The study of energy and forces.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

- https://www.google.com.pk/webhp?hl=en#hl=en&q=branches+of+science

Before you start a lesson in a class, give reading task of the lesson in homework to your students. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

Warming up is the time to plough.

In a class, it's important to build a firm link between the concepts students already have as they studied in previous grade about science and the concept you are going to give them about the branches. For that you may ask:

- What is science? Answer with examples.
- What do we call people who do experiments and generate new ideas?
- Scientist always asks many questions. How many of you could be the scientist of the future?
- When we make group of things we can identify them easily, such as we have separate sections for grocery, crockery, wardrobe, books, etc. Do you think science also has some groups to study easily?
- Don't you think we should keep living things and non living things separate to study easily?
- Do you think that there should be the separate group of different materials and different forces

Note: (There could be more questions to be asked.)

Once you find your students excited to learn more, it's time to sow

Discussion:

In discussion, the main objective is to highlight the importance of grouping and identify the right member of the group. You should tell students that to make finding easy and for easy study, area of studies are grouped according to their properties. For example, living things are absolutely different from non living things. We separate living things from nonliving things and keep living things in a major group of science called Biology. It means that we study every living thing in the branch of science, named as Biology. Similarly among non-living things, properties of materials are different from energy and forces. We keep that is why materials, matter and mass in a major of science called Chemistry and energy and forces, or movements and forces in Physics.

Tell them how these fields play important role to make our lives better. Tell different inventions and contributions of biologists, chemists and physicists

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures of different things and ask them to keep them in their in their groups.

Key words	Common words
Biology	Matter
Physics	Energy
Chemistry	Motion
Biologist	Forces
Physicists	Assumptions
Chemist	Observations
Theory	Experiments
	Conclusions

Summarizing:

Summarize the lesson in points as:

- Science starts with observations, leads to experiments, conclusions and finally the development of the theory.
- The major branches of science are Biology, Chemistry and Physics.
- Scientists of biology are called biologists.
- Biology is the study of life and living things, such as humans, animals and plants.
- Chemistry is the study of matter and the changes in them.
- Scientists of the chemistry are the chemists.
- Physics deals with the matter and energy and their relationship.
- Scientists working in the field of physics are called physicists.
- Physics is used by engineers to invent new things, such as infra-structure.

Assessment:

Once you find that discussion is complete, check the concepts of your students. You may ask:

- What is science? What are the major branches of it?
- Why do we need to divide science into its fields?
- In which field we study insects?
- Which branch helps us study gravity?
- What properties do we study in chemistry?
- What wants to be a chemist or physicist or biologist? Why do you want to be this scientist?

Think and write

1. Observation or question
   Ideas or assumptions
   Experiment
   theory
   (Prefer students' answers)
2. Everything around is matter. Matter is studied in chemistry. It means chemistry is integrated everywhere.
   (Let student find out the answer themselves)
3. Physical science.
   (Let student find out the answer themselves.)
4. Plastic, fridge, airplane, elevator, dwarf plants.
   (Prefer the list given by the students.)

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 2: characteristics of Living Things

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with Living and non-living things.

Aim of the lesson:

Students are now able to identify living and nonliving things. They know there difference too. The aim of this lesson is to basics of the characteristics of living things. They will be able to understand the seven basic living characteristics of living things that nonliving things do not have. It helps build a firm foundation for understanding body sciences.

Learning objectives:
In this lesson students will know:

- Major difference of characteristics between living and nonliving things
- Seven basic life processes that differentiate living things from nonliving things.

Helping tools:
Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educationalkids conceptual videos and activities** for elementary students to learn on the web.
  Visit:
  https://www.google.com.pk/#q=characteristics+of+life
  http://www.exploratorium.edu/imagingstation/activities/classroom/characteristics/ca_characteristics.php

Before you start a lesson in a class, give reading task at home of the lesson to your students. This reading task will help them understand the lesson and evaluate their level of understanding through brainstorming exercise.

Warm up:

Warm up or brainstorming is an essential tool of teaching for learning. In a class, ask different questions to know the existing information of the students. It will help you find out to focus on what and whom during the lesson. The following activity will help students to understand the lesson.

Distribute handout of this activity to your students and ask them to fill this up confidently. Answer of everyone will be appreciated. ***One is done for them.***

Living things	Nonliving things
move	**do not move**

Check the sheets and evaluate what your students know. 95 percent of students will have correct concepts.

Once you find your students excited to learn, it's time to sow.

Discussion:

Students should know already that living things need food, they grow and move, they breathe, they feel, they have young ones and they remove wastes from the body. At this level students should know the characteristics of living things scientifically. This lesson is basically the revision of characteristics they have been studying in previous grades. This time your focus should be towards terminology and the process of seven basics characteristics, named nutrition, growth, reproduction, respiration, movement, sensitivity and excretion. Nutrition talks about the effect of nutrients on other life processes, such as growth. Tell them food intake of animals, plants and humans. Tell them why these processes are important. Would happen if any of the process stopped? Similarly discuss all six properties mentioned in the textbook.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain their characteristics.

Key words	Common words
Living thing	Life process
Nonliving thing	Feeding
Nutrition	Heal
Growth	Survive
Reproduction	Inhale
Respiration	Exhale
Movement	Environment
Sensitivity	Urination
Excretion	Defecation
	Perspiration

Summary:

Summarize the lesson in points as:

- All living things have certain characteristics that make them different from nonliving things.
- These characteristics include nutrition, growth, reproduction, respiration, sensitivity, movement and excretion.
- All living things reproduce. Some animals produce young ones and rest lay eggs. Plants germinate from seeds.
- All living things breath with the process called respiration, in which they inhale oxygen and exhale carbon dioxide.
- All living things move to find shelter food and escape from harm.
- All living things are sensitive to their surroundings. They may feel, see, smell taste and hear.
- All living things excrete. They release water and chemicals through different process such as urination, defection, transpiration, etc.

Assessment:

Once you find that discussion is complete, check the concepts of your student. You may ask:

- What are the properties that make living things different from the non living things?
- Which is the most important characteristic which affect all other life processes?
- What is respiration? Why it is needed?
- What is excretion? Why it takes place?
- What do we call a life process that heals a broken bone?

There could be more questions to be asked.

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Answer)

1. Plants (Students may write the names of some animals, such as some spider that cannot see.)

2. Clouds are non-living things. They move due to wind and they get bigger due to water drops.

3. Automobiles are non-living things. They are the machines that run on batteries.

4. Seeds are living things. They need right amount of water and air and a place to germinate.

Note for a teacher
Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.
For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 3: Our Body Sciences

Time required: **360 minutes** or **6 hours** with Activity book and revision of the lesson.

Start this lesson in progression with the lesson "human's body parts".

Aim of the lesson:

This time students are ready understand the complexity of human body. They know different organs and skeleton. They know the role of different parts of the body. The aim of this lesson is to describe a human body parts at cellular level now. They will be able to understand in senior grades that a single cell has complete instructions for the structure and function of a body.

Learning objectives:

In this lesson students will know:

- Cell, the basic unit of life
- Cells that make up tissue
- Tissues that make different organs
- Organs that together with other organs make an organ system

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

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- **Other links:**

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  Visit:

  - https://www.google.com.pk/webhp?hl=en#hl=en&q=human+body+sciences
  - https://www.google.com.pk/#q=human+organ+system

Before you start a lesson in a class, give reading task at home of the lesson to your students. This reading task will help them understand the lesson and evaluate their level of understanding through brainstorming exercise.

Warm up:

As students know different body parts and their functions. This time they should know that every single part of our body is made up of or build up by living cell. You may give them the example of a building which seems huge but it is constructed by the small units called bricks. Similarly cell is the smallest unit of the body or every part of the body. Cell makes the blood, cell makes different organs, cell makes bones, cell makes muscles etc.

- Name two external and two internal parts of our body.
- What do you know about skeleton?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow

Discussion:

As the basic aim of the lesson is to tell about cell, tissues, organs and organ systems of the body. It is better if either a big poster of the human organ system or visit to a biological lab is arranged. Student should see the differences among all. Show them tissues, organs and how organs make up a system, like digestive system, circulatory system etc. Once they understand tell them every thing is originated from a single cell. Show them the structure of a cell. It will be more better of you show them through a microscope.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
digestive system reproductive system nervous system circulatory system muscular system skeletal system circulatory system	cell tissue organ skeleton microscope lungs liver heart

Summarizing:

Summarize the lesson in points as:

- Skeleton gives frame to the body and keeps its vital organs intact.
- Skin covers whole structure and beautifies it.
- Blood keep circulating in the body to keep it alive.
- Cell is the tiny living unit.
- There are more than 200 different types of cells in the body.
- When same type of cells combines together a tissue is formed.

- Muscles and fats are the type of tissues.
- Bone is the solid tissue and blood is the liquid tissue of the body.
- Organs are formed when two or more type of tissues combined together.
- Among many organs some are vital and essential for our survival. These are lungs, heart, liver, stomach and brain.
- There are almost 22 organ systems in the body.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- Make the journey of organ system in descending order.
- Why tissues are important?
- How many organ systems are there in our body?
- What is the function of reproductive system of the body?
- Name any five vital organs of human body?
- What is the name of that organ in circulatory system which pumps the blood in the human body?
- In circulatory system the blood goes from the heart into the body, where it goes back?

Think and write

1. Single unit of the body is called a cell. Cell has all functional and structural instructions for the body.
2. Human body contains blood and bones which are the types of the tissue. We cannot survive without them.
3. Organ system performs specific function of the body in a very organized way.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 4: **The Musculoskeletal System**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in continuation with Lesson 3.1

Aim of the lesson:

The aim of the lesson is to tell about the importance of the muscles and skeleton together. Students should know now that how different parts of our body collaborates with each other.

Learning objectives:

In this lesson students will know:

- Skeleton and the muscles of the body
- Function of musculoskeletal system
- Types of muscles.
- Bones, Joints and ligaments

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

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  - ***Visit:*** https://www.google.com.pk/search?hl=en&site=imghp&tbm=isch&source=hp&biw=1164&bih=839&q=musculoskeletal+system&oq=musculo&gs_l=img.3.2.0l10.3476.6834.0.9818.7.6.0.1.1.0.254.1387.2-6.6.0....0...1ac.1.64.img..0.7.1403.H4xW9R2Blk0
  - https://www.google..pk/webhp?hl=en#hl=en&q=musculoskeletal+system

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- How many bones human body has?
- How many muscles in human body?
- How muscles get energy?
- Name any three joints of body if you remember.

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

As these topics need visual aid for better understanding, it is better if your take your students to the lab or bring specific posters for muscular system and skeletal system of the body. They should identify muscles at different points and bones and joints of the body.

Now show them muscular system of the body, what its role is and how it works. Show them some muscles that work voluntary and those that involuntary. Here give examples of heart's beat and eyes' winkle and the muscles of leg and arms etc. Tell them the difference between smooth, skeletal and cardiac muscles. They should know also that how to keep them healthy.

Students have learnt about bones and joints. This time tell them different types of joints and how joints connect with bones through ligaments.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
musculoskeletal system	muscles
voluntary	tissue
involuntary	contract
tendons	relax
marrow	balanced diet
blood vessel	regular exercise
red blood cells	skull
joints and ligaments	heal

Summarizing:

Summarize the lesson in points as:

- Our skeleton is made up of bones. It gives our body strength and structure. There are 206 bones in a human adult.
- Muscles are made up of tissues. They enable the parts of our body to move or work.
- Muscles and the skeletons work together. They make up the musculoskeletal system.

- Cardiac(heart) muscles and smooth muscles are involuntary muscles. Skeletal muscles are voluntary muscles.
- Food gives energy to our muscles. Exercise makes our muscles healthy and strong.
- Bones have a hard material in them. The soft internal part of bones is called bone marrow.
- Bones are connected together through joints.
- Ligaments help joints to link the bones together.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- What is the function of tendon?
- What we called the joint of knee and elbow?
- What does bone store?
- What is not the job of a skeletal system?
  - ❖ Remove waste from the body
  - ❖ Make blood cells
  - ❖ Give support and shape to the body

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' answers)

1. What would happen if there was either no skeleton or no muscles in our body? Write about both situations separately.
2. Our eyes have involuntary muscles. They keep working without letting us know.
3. It helps in body movement
   It protect some delicate organs of the body
   Some helps in making blood.
4. Bone is the part of the body that stores mineral, such as Calcium.
5. Joint is the place where two bones meet. These two bones are joined with the help of ligaments.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 5: **Balanced Diet**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the lesson.

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

The basic aim of the lesson is to make students understand the effect of our diet on our health and hence on our lives.

Learning objectives:

In this lesson students will know:

- Importance of balanced diet.
- Healthy food groups

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

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- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  https://www.google.com.pk/webhp?hl=en#hl=en&q=balanced%20diet

  http://www.nhs.uk/Livewell/Goodfood/Pages/Healthyeating.aspx

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- You know about a healthy diet, what could be the meaning of the balanced eating?
- Why healthy eating is important?
- How many vegetables do you eat in a day?
- Name five foods that you think are healthy for you?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

Here the main objective is to make them realize the importance of a balanced diet. Before that they should know the importance of something in a balance. You may give different examples of effects when they lose the balance, such as CFCs, food chain etc. similarly when eating something more than a need or less than a need badly affects our body.

Tell them what and why our body needs to eat in how much quantity. Give them the details of different food groups and make sure that they adopt the healthy eating.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
carbohydrates	food pyramid
calcium	healthy food
protein	marathon
grain	fruits
dairy products	vegetables
vitamins	fiber
minerals	energy
	grow

Summary:

Summarize the lesson in points as:

- Balanced diet contains all nutrients in balanced amount.
- It gives right amount of proteins, carbohydrates, fats, minerals and vitamins.
- It helps our body to function properly.
- Every living thing gets energy from food**.**
- Even if we are sleeping we need energy to survive.
- There are five different group of food.
- Eating a **balanced diet** means that you choose foods in the right amounts from each of the food groups.
- Balance diet makes our body strong and keeps us healthy.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- Why we do need a balanced diet?
- Which is not dairy product from these products?
  - ❖ milk
  - ❖ egg
  - ❖ yogurt
  - ❖ banana
- Why fruits and vegetables are important for our body?
- How much serving of dairy products our body required in a day?
- Which type of vitamin sun give to us?
- What is the main source of calorie in our diet?
- What do you think, why healthy eating is important?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Eating right amount of food from the food group is called a balanced diet.
2. Proteins makes our muscles develop and repair. We can get these proteins from eggs and beans.
3. It gives us instant energy and may help in digestions. We can get carbohydrates from bread and wheat.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 6: **Teeth**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

Students already know the functions of human body parts. It's time to understand the food system of human body. Teeth are the fundamental part of digestion and helps in chewing and breaking food into pieces. Our teeth are one of the hardest parts of body. In this lesson student will be able to learn about functions and structure of teeth.

Learning objectives:

In this lesson students will know:

- Structure of teeth.
- Functions of teeth.
- How we protect our teeth.
- Common dental problems.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - http://www.toothclub.gov.hk/en/pnc/en_pnc_2_2_1_5.html
  - http://www.webmd.com/oral-health/picture-of-the-teeth

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Do you know how many teeth you have in your mouth?
- Do you remember, on what age you lost your first tooth?
- Can you speak without teeth?
- Imagine yourself without teeth, how will you look discuss with your friends?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

Understanding of teeth need visual aid, it's better to show them artificial human teeth. Human teeth can eat different types of food. They can eat plant and meat. Teeth have different types, they perform separate functions. Some are on upper side and some are on lower side.

These are:

- **Incisors:** Four middle teeth are incisors. They used or snipping food. They are wide and sharp, flat in size. There are eight incisors teeth in our mouth.
- **Canines:** there are four canines teeth in our mouth. They are like pointed daggers. Canines teeth are used for cutting food into pieces, gripping and gripping food.
- **Premolars:** Premolars teeth are exist in between canines and molars. They are total eight in numbers.
- **Molars:** Molars are used in crushing and chewing. They are larger in size.

Teeth have some common dental problems like **tooth decay**, **tooth plaque** and **cavities.** We can prevent ourselves from these problems by brushing and flossing. Tell them why brushing teeth two times a day is necessary. Too much sugary foods may harm our teeth. Toot are sensitive too, never take hot and cold items together.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
snipping	cutting
ripping	grinding
incisors	chewing
canines	bacteria
premolars	cavity
molars	daggers
tooth decay	crushing
tooth decay	dental habits
enamel	toothache

Summary:

Summarize the lesson in points as:

- Teeth give shape to our face and help in chewing food.
- Teeth perform the first step of food digestion.
- Incisors are wide and flat with sharp cutting edges used for snipping food.
- Canines are used for cutting, gripping and ripping food.
- Premolars are smaller than molars and are used for grinding food.
- Molars are flat surface teeth used for crushing and chewing food.
- Enamel is a coating on every tooth to protect it from bacterial acid.
- Tooth decay is the process in which acid in our mouth damages the enamel.
- A cavity is a hollow space which forms when bacteria damages the inner part of a tooth.
- Dental plaque is a sticky clear film that forms on teeth and between teeth, both above and below the gum line.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- What is enamel?
- What is the name of four middle most teeth of our mouth?
- Which type of teeth are help in crushing and chewing?
- What is the cause of tooth plaque?
- Why we should use fluoride toothpaste?
- What is the function of molar teeth?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Too much sour food and sweets harm our teeth and caused tooth plaque.
2. Brushing regularly remove bacteria from our teeth and save us from dental problems.
3. Human teeth have different sizes and shape, they perform different functions.
4. Tooth decay is the damage of enamel and enamel is a coating on every tooth to protect them. Bacteria damage this enamel and it harms our teeth.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 7: Classifying Animals

Time required: **360 minutes** or **6 hours** with Activity book and revision of the lesson.

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

Aim of this lesson is to make students understand the classification of animals. The phenomena of animal kingdom, vertebrates and invertebrates.

Learning objectives:

In this lesson students will know:

- Classification of animals.
- Animals with backbone are vertebrates.
- Animals without backbone are invertebrates.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=animalsclassification
  - https://www.google.com/search?rct=j&q=vertebratesandinvertebrates

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Do you know which type of animal are called vertebrates?
- Do you know which type of animal are called invertebrates?
- Do you think environmental temperature effect on animal skin?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

Students learnt in previous classes that animals are living thing. Now it's time to tell them that we can classify animals into different categories. Animal kingdom has two major division **Vertebrates** and **Invertebrates.**

Vertebrates:

Vertebrates are those animals who have backbone in their body. It is the part of skeleton and supports movements of body. It is make up 3% of all animals species. Fishes, birds, amphibians, reptiles and birds are the examples of vertebrates.

Invertebrates:

Invertebrates are the animals without backbone. They do not have skeleton inside. It is the group of animals that make up 97% of all animals species. It is presents in all sizes and shapes. Insects, jellyfishes, worms, octopus, starfishes and crabs are some examples of invertebrates.

In this lesson they will also learn about warm-blooded animals and cold-blooded animals.
Warm-blooded animals have constant body temperature, temperature did not effect on their body.
Cold-blooded animals have take the temperature of their surroundings.
In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
vertebrates	feathers
invertebrates	birds
reptiles	fur
amphibians	scales
mammals	insects
animal kingdom	temperature
worm-blooded animal	moist
cold-blooded animal	backbone

Summary:

Summarize the lesson in points as:

- Animal kingdom is the major group of animals.
- Animals are divided into vertebrates and invertebrates on basis of their structure.
- Vertebrates are the animals with backbones.
- Vertebrates are amphibians, fish, reptiles, birds and mammals.
- Invertebrates are the animals without backbone. These are insects.
- Worm-blooded animals have constant body temperature.
- Cold-blooded take up the temperature of surroundings.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- Which type of animal give live birth of their youngones?
- Which type of animal lay eggs?
- Do all warm-blooded animals have constant body temperature or they adopt the temperature of their surroundings?
- Name any five cold-blooded animals.
- In how many groups Vertebrates are further divided?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. There are two major types of animal, vertebrates and invertebrates. Animals with backbone are called vertebrates and animals without backbone are called invertebrates.
2. Human needs more food to maintain their temperature than reptiles because reptiles skin texture is naturally hard they can bear the ups and downs of weather easily rather than the humans.
3. Prefer students' Answers.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure

Lesson 8: **Habitat and Adaptation**

Time required: **180 minutes** or **3 hours** with Activity book and revision of the lesson.

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

Aim of this lesson is to make students understand the importance of habitat and the adaptation animals adopt from their habitats.

Learning objectives:

In this lesson students will know:

- Animals and their habitats.
- Adaptations of habitants.
- Specification of camouflaged animals.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=habitatofanimals
  - https://www.google.com/search?rct=j&q=adaptationofanimals

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Do you know who are habitants?
- Do you think fish can survive in desert?
- Tell the name of one animals who can survive in ice burgs?
- Do you think animals can survive without plants?
- What we call animal which is being hunted by other animal?
- Name one animal whose habitat is a desert?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

In discussion, the main objective is to understand the importance of habitat and identify the adaptations from habitat. All living things need habitat for living and they are called habitants. The behaviour and structure of living thing is modified according to their habitat. This phenomena is known as adaptation, and the habitants are called adapted.

Students should know about the camouflaged animals. Tell them about camouflaged is the adaptations of texture and colours in a animals from their habitat

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
habitat	behaviour
adaptation	structure
predator	hump
prey	gills
habitants	desert
camouflage	lungs
blend	

Summary:

Summarize the lesson in points as:

- Habitat is a place where living things live.
- Living things find food, shelter and protection for survival in their habitat.
- Animals change them according to their habit. This is called adaptation and animal is called adapted.
- Habitat may have a predator that hunts and a prey that is eaten up.
- Camouflage is the adaptation of colours and body pattern in animals.
- Camouflage helps prey to hunt and protect them from their predators.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- Why living thing need friendly environment for living?
- Which animal hunted at night and can see in dark nights??
- What is the habitat of polar bear?
- An animal hunt down another animal for its food is called?
- Do you thing a living thing could be the habitat for another living thing?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Camel can survive in a hot weather because they have thick coat of hair that protect them from Sun. They also wide and long feet so they can walk in hot sand for long time.
2. Camouflage is very beneficial for animals it helps them to protect from predator. (Prefers' students answers)
3. Polar bear has thick white fur it helps polar bear to stay warm.
4. Prefers' students answers.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now. For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 9: **Investigating Leaves**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the lesson.

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

We explained about plants and parts of plants in previous grades student will understand the parts and structure of leaves. This time we emphasize on the process of photosynthesis of leaves.

Learning objectives:

In this lesson students will know:

- Structure of leaves.
- Part of leaves.
- Transpiration process.
- Respiration process.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=partsofleaves
  - https://www.google.com/search?rct=j&q=structureofleaves

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- What do you think, which tree has the largest leaves?
- Can we eat leaves?
- Does all leaves look same?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

In previous grades, students learnt about the parts of plants and leaves are the vital part of plant. In this lesson they will study about the parts and structure of leaves.

Leaves have different shapes and size, texture and pattern ad also have different strengths. Midrib and side veins, Margin, Petiole and Blade are the major parts of plants. Tell them about these parts in detail. Students learnt about the germination of plants now tell the process of photosynthesis, chlorophyll substance and the process of transpiration and respiration.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
photosynthesis	structure
midrib	mixture
side veins	growth
margin	texture
petiole	pattern
blade	vapours
chlorophyll	surroundings
transpiration	excretion
respiration	investigate
stomata	strengths

Summary:

Summarize the lesson in points as:

- Leaves have different shapes, sizes and colours.
- A leaf itself has many parts. They decide its structure.
- Photosynthesis is a process in which leaves prepare food for a plant using sunlight, air and water.
- Chlorophyll helps a leaf in preparing food. It is green colour pigment present in a leaf.

- Oxygen and glucose are produced through photosynthesis.
- A leaf releases extra water as vapour by transpiration through tiny holes on their surfaces called stomata.
- The plant breaks down glucose by the process of respiration. This is how a plant gets energy for growth and development.
- Carbon dioxide and some water is also released during plant's respiration.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- What is photosynthesis process?
- What is stomata?
- In which process water evaporates from leaves?
- Which process takes place during day and night?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Because animals and humans do not have Chlorophyll.
2. Blade is the part which gives shape to leaf. (Prefer students' answers)
3. Animals and environment also takes the sunlight, air and water that is very beneficial for them. (Prefer students' answers)
4. (Prefer students' answers)
5. Chlorophyll is a green substance, it gives green colour to leaves.
6. Leaves chlorophyll absorbs light energy in presence of carbon dioxide and water as a result plant produce glucose and oxygen, and this process is called photosynthesis.
7. Plants maintain their temperature through Transpiration.
8. Plants release carbon dioxide through process called respiration.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.
For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 10: Pollination and Fertilization

Time required: **360 minutes** or **6 hours** with Activity book and revision of

Start this lesson in progression with the previously given concept of healthy diet.

Aim of the lesson:

In previous lesson we explained parts of leaves now it's time to learn about the parts of flower. They will be able to learn the process of fertilization and pollination.

Learning objectives:

In this lesson students will know:

- Parts of flower.
- Pollination process.
- Fertilization process.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=fertilizationofflowers
  - https://www.google.com/search?rct=j&q=pollinationprocess

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Which part of plant gives fragrance?
- From which part of plant insects and bird suck nectar?
- Where we plant seeds?

(Note: there is more to ask)

Try to involve every student in discussion. Once you find your students excited about computer, it's time to sow.

Discussion:

Students should already know that plants have different parts and we can used these parts for different purposes. In previous lesson we investigate the leaves thoroughly, now this time they will learn about the parts of flowers with the help of pollination and fertilization process.

Flowers grow through pollination process and they produce pollens. It has further division of self-pollination or cross-pollination. Some products are the food products of many insects and birds.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
cross-pollination	seed
self-pollination	wind
ovary	animals
pollens	insects
sepal	fertilization
petals	reproduction
stamen	nectar
pistil	organs
stigma	flower
anther	

Summary:

Summarize the lesson in points as:

- Seeds are formed by the process of pollination and fertilization.
- Pollen grains are produced in stamen.
- Pollination is the transfer of pollen grains from anther to stigma.

- Self-pollination takes place within a single flower. Cross-pollination occurs in between different flowers.
- Nectar is a sweet substance produced in flowers. It provides food to many animals.
- Pollen grains can be transferred by insects and animals, wind water and humans.
- When pollens get into stigma, they reach to the ovary via style.
- In ovary finally fertilization takes place, resulting in seeds formation.

Assessment:

Once you find that discussion is completed, test the concepts of your student. e.g., you may ask:

- In which season pollen take places?
- What is self-pollination process?
- What is cross-pollination process?
- What is fertilization process?
- Define the structure of flower?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Animals help plant in fertilization. (Prefer students' Answers)
2. In pollination, pollens transfer the grains from anther to stigma of another flower for the germination of new seed. (Prefer students' Answers)
3. (Prefer students' Answers)
4. Animals help plants by dispersing seeds around in different areas.
5. (Prefer students' Answers)
6. (Prefer students' Answers)

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 11: **SEPARATING MIXTURE**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with the previous understanding

Aim of the lesson:

The aim of the lesson is to understand that two or more substances make mixture and we can separate these mixtures through different processes.

Learning objectives:

In this lesson students will know:

- Mixture is made up of two or more substances.
- Mixtures may contain solid, liquid and gas.
- Mixtures can separate by different methods.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=types%20of%20mixtures
  - https://www.google.com/search?rct=j&q=methods%20of%20separating%20mixtures

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Do you know how many states a matter has?
- What should we do to get out the salt from the solution?

(Note: there is more to ask)

Once you find your students excited to learn more, it's time to sow

Discussion:

At this level, students already know that matter has three different states solid, liquid and gas.
Tell them these matters usually found together in nature like mixture of liquid and gas(fog), solid and gas (smoke), solid and solid (sand), gas and gas (air), etc. We can separate these matters by using different physical methods. Mixture of solid could be separated by hand sortingmethod; small particles of sand could be separated by sieving method. You should tell them magnets attract magnetic materials so magnetic materials can easily be separated by magnetic separation.

Filtration is a most common method of separating materials. In filtration method we can separate insoluble solid and liquid by using filter paper. Another process of separation materials is evaporation, in evaporation process liquid changes into gaseous state by heating it. The most common example of evaporation is separating of salt and water or sugar and water.

You should ask students to bring one sieve and sand; different colours of beats, filter paper to perform these physical methods in class for better understanding of lesson.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
suspension	separate
hand sorting	filter paper
sieving	particles
magnetic separation	uniform
filtration	mixture
evaporation	substances
insoluble solid	particles
residue	technique
components	materials
gaseous state	solid
filtrate	liquid
beaker	gases

Summary:

Summarize the lesson in points as:

- A mixture is made up of two or more substances.
- Some mixtures can be separated manually, such as through sieving, magnetism and filtration.
- Mixtures are of different kinds depending upon the states of matter.
- Filtration is the separation of insoluble solid from a liquid.
- Evaporation is the separation of a mixture of soluble solid and a solvent.
- Magnetic materials can be separated out from a mixture by magnetism.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- How do you separate different colours beads?
- If something has been dissolved in water, which method could separate it from water again?
- What will happen when we apply sieving process on sand?
- If you want to separate iron from sand which instrument will you use?
- What do you think; Suspensions are best separated by which process?
- Name any one natural mixture of liquid and liquid.
- Name one mixture of solid and liquid.
- What is filtration process?
- What is evaporation process?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

5. We cannot see through milk, light does not let through in it because milk is opaque material.
6. Prefer students' Answers
7. Firefighters wear a mask because they have to fight with actual fire, smoke or water, so they have to wear a safety mask.
8. Prefer students' Answers
9. Pebbles can be separated from the soil through the process of sieving.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 12: **INVESTIGATING ATMOSPHERE**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with the previous understanding.

Aim of the lesson:

The aim of this lesson is to understand that we live on a planet Earth and its atmosphere makes it suitable for living. Atmosphere is made up of different gases like oxygen, nitrogen and carbon dioxide.

Learning objectives:

In this lesson students will know:

- Earth's atmosphere consists of nitrogen, oxygen and carbon dioxide.
- Erath's atmosphere divided into five major layers.
- Pollutants of atmosphere may cause global warming.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

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- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  https://www.google.com/search?rct=j&q=layers%20of%20atmosphere

  https://www.google.com/search?rct=j&q=investigating%20atmosphere

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Which is the only planet where life exists?
- Can we live without breathing?
- What do you know about global warming?

(Note: there is more to ask)

Once you find your students excited to learn more, it's time to sow

Discussion:

The main idea of the lesson is to understand is to give the concept that atmosphere of planet makes it suitable for living of living things. Air is basically referred to as atmosphere. It saves or protects us from ultraviolet rays of Sunlight.

Composition of Earth consists of thin layer of gases like Oxygen, Nitrogen and Carbon dioxide. Earth's atmosphere is divided into five major layers; Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere. The divisions of layers based on their temperature.

Troposphere is the closest layer of Earth's atmosphere. It contains 75% of the atmosphere's mass. At the very top of the troposphere has its boundary called tropopause; where the temperature stable or decreases and acts like an invisible barrier.

Stratosphere is warmer on its height and decreases on its lower side and it remains constant at lower part. It contains a thin layer of ozone molecules and forms a protective layer of shielding which absorbs or protects from harmful ultraviolet rays comes from Sunlight. Its boundary layer is called staropause.

Mesosphere is a cold layer where the temperature's decreases with the height. It does not support any jet or satellite and its boundary layer is called mesopause.

Thermosphere it is one the hottest layer of Earth's atmosphere. Its temperature also increases with height and got extremely hot. Its boundary is called thermopause.

Exosphere is the outer most layer of Earth and practically empty like vacuum because its molecules escape into the atmosphere.

Briefly discuss in your class global warming and tell them how it effects our atmosphere with the help of given picture in the book.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
atmosphere	weather
troposphere	pollution
stratosphere	evaporates
mesosphere	ultraviolet
thermosphere	ozone layer
exosphere	radiations
global warming	escape
chlorofluorocarbons	fire extinguisher
thermopause	air-conditioners
stratospause	refrigerators
meteors	spray cans
mesopause	decreases
tropopause	

Summary:

Summarize the lesson in points as:

- Atmosphere is the covering of gases around the Earth. It protects us from harmful rays of the sun and space.
- Atmosphere consists of 21% oxygen, 78% nitrogen and 0.04% Carbon dioxide.
- Earth's atmosphere is divided into five major layers. Every layer has a separate boundary called a pause.
- Troposphere is nearest to Earth. Clouds develop, rain falls, birds and aeroplanes fly in this region.
- Stratosphere consists of ozone layer that absorbs harmful rays.
- Mesosphere does not support any satellite.
- Thermosphere is the fourth layer from the surface. Temperature gets extremely hot here.
- Exosphere is the thinnest layer. Its molecules can escape into space.
- Pollution may harm the ozone layer. Due to pollutants global warming is increasing that may badly affect lives on Earth.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- How many layers Earth has?
- Which layer of Earth is nearest to Sun?
- What is the ratio of oxygen gas in our environment?
- What is the ratio of nitrogen gas in our environment?
- Which is the outer most layer of Earth?

- Which layer of Earth absorbs harmful ultraviolet radiation of Sun?
- How global warming effect our environment?
- CFC's stands for?
- Which layer is the thinnest layer of Earth?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Prefer students' Answers.
2. We should remove vehicles smoke from our environment.
3. "Exo" comes exit that's why it is the outer most layer of Earth.
4. Prefer students' Answers.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 13: **FRICTION AND RESISTANCE**

Time required: **180 minutes** or 3 **hours** with Activity book and revision of the

Start this lesson in progression with the previous understanding.

Aim of the lesson:

The aim of the lesson is to understand that friction is the resistance force. It's time to develop their understanding towards importance of force of friction in our daily life. They will be able to identify different forces of friction like air or water.

Learning objectives:
In this lesson students will know:

- Friction is the force of resistance.
- Amount of friction between two forces depends upon the roughness or smoothness of both surfaces.
- Friction has some demerits too.

Helping tools:
Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

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  Visit:

  - https://www.google.com/search?rct=j&q=friction%20and%20resistance
  - https://www.google.com/search?rct=j&q=types%20of%20resistance

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- What do you know about friction?
- Have you ever experience friction during walking or swimming?

(Note: there is more to ask)

Once you find your students excited to learn more, it's time to sow

Discussion:

The main objective of the lesson is to understand friction is the force that resists the motion of the object. It plays an important part in many everyday process of life. It usually depends on the roughness or smoothness of the surfaces.

Relation between wheels of vehicles and road is the best example of friction; tell your students that high friction in the wheels helps to down the speed of vehicles and less friction in the wheels helps to boost the speed of vehicles.

There are two major types of friction air friction and water friction.

Air resistance it is the friction that any object experience when they move on atmosphere. Air resistance mainly depends on the shape of the moving objects. All the air craft's have pointed shape because it minimizes the air resistance during travelling.

Water resistance it is the friction that any object or human experience when they move on water. Water resistance also depends on the shape of the objects. Boats and ships designed in such a way to minimize water resistance.

Tell your students that friction has some demerits of friction. Like;

- Friction produces unnecessary heat.
- More power needs to exert on machines or engines due to friction.
- Engines of automobiles consume more fuel.
- Friction opposes the motion.
- Friction produces noise in machine or engines.

Tell them more about friction or resistance and make a activity chart of merits and demerits of friction. In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
friction	smoothness
resistance	surfaces
air resistance	vehicles
water resistance	engines
worn	machinery
roughness	drill
pointed shapes	pierces

Summary:

Summarize the lesson in points as:

- Friction is a type of a force.
- Friction causes resistance between two surfaces in contact with each other.
- Smooth surfaces have lesser friction between them as compared to rough surfaces.
- Friction is useful for us. It helps us to walk, write or hold things.
- Water and air resistance are types of friction. They mainly depend upon shape of the surface.
- Friction has disadvantages too. It wastes energy of engines as heat, won out tyres and shoe too.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- What do you think friction is useful or not?
- A toy car moves on fastest speed on which type if surface?
- In which direction force of friction acts?
- Frictional force depends on?
- Rougher surface have _____ friction.
- If we apply oil on doors hinges, the friction will?
- Smoother surface have _____ friction.
- Friction produces?
- Name three causes of friction.

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Oil reduces the friction of the roads that's why vehicles lose their control.
2. Sweatiness enhances the friction. (Prefer students' Answers)
3. **Merits:**
   a) It helps in holding or griping the things.
   b) It helps in walking on floor.

   Demerits:
   a) It resists motion.
   b) It produces noise.

4. Pointed shapes reduce the air resistance.
5. Prefer students' Answers
6. It mostly depends the shape of an object.

Note for a teacher
Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.
For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 14: **UNDERSTANDING MACHINES**

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with the previously given concept.

Aim of the lesson:

The aim of the lesson is to understand that we use different types of machines in our everyday life. Machine makes our work easier and saves our time.

Learning objectives:

In this lesson students will know:

- Machine is a simple tool.
- Machines need force to work.
- Simple machines have two basic families.
  - The Lever family.
  - The Wedge family.

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  - https://www.google.com/search?rct=j&q=simplemachines
  - https://www.google.com/search?rct=j&q=simple%20lever%20and%20wedges

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Would machines reduce amount of time we needed to do any job?
- Name any three simple machines name we use in daily life?

(Note: there is more to ask)

Once you find your students excited to learn more, it's time to sow

Discussion:

The main objective of the lesson is to understand the main purpose of machines in our daily life. Tell them there are two different types of simple machines family we use for make our work easier and they also saves our time. **The Lever Family** has three tools Lever, Wheel and Axle, Pulley. **The Wedge Family** also has three tools Inclined Plane, Wedge, Screw.

Lever is used to move or lift heavy objects with least amount of force.
Wheel and Axle make moving things much easier because it removes friction, in earlier era it was probably used for raising weights or water buckets from wells.
Pulley is consists of wheel and rope and it is used to lifting heavy loads or change the direction of forces.
Inclined Plane is a flat slopped surface with one higher end. It allows less force to move an object.
Wedge is a triangle tool used to separate objects into two or more pieces. It has very sharp edge on its one ending.
Screw is a machine which has round and flat head; it has used to hold two objects together.
Once students will understand the lessons, you should tell them the more about simple machines and give common examples of them for better understanding.
In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
lever	simple machine
pivot or fulcrum	effort
pulley	construction
crowbar	elevators
nutcracker	lifting
inclined plane	sloped
wedge	splits
screw	friction
wheel and axle	wheel chocks
resistive force	crane

Summary:

Summarize the lesson in points as:

- Machines make our work easier and save our time.
- Those machines which have very parts are called simple machines.
- A lever is a simple machine used for moving or lifting heavy objects.
- A pulley is simply a fixed wheel. This is used for lifting heavy load upload.
- Inclined plane is simply a flat slopping surface that helps shifting heavy objects from one level o f height to another without lifting them.
- A wheel and an axle is that simple machine in which a rod is attached to the center of a wheel.
- A wedge is a simple machine with at least one sloped side ending in a sharp edge.
- The screw is cylinder with an inclined plane twisted around it.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- What is simple machine?
- What is the main purpose of simple machines?
- Tell two examples of wedges.
- A knife is example of?
- What is the function of screw?
- What is the function of inclined plane?
- How does a screw work?
- What is the purpose of wedges machines?
- Which machine allows less force to move the objects?
- What is the role of rope in a pulley machine?
- What is the shape of inclined plane?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. (Prefer students' Answers)
2. For lifting heavy materials to the high roof we use pulley machine because it has a fixed wheel that can rotate and a chain which passes over the wheel to transfer load.
3. Knife and axe are one of the simple machines called wedge and usually made up of steel or iron. They have one slope side ending in shape and have sharp edges.
4. (Prefer students' Answers)

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson 15: ELECTRICITY AND THE CIRCUITS

Time required: **360 minutes** or **6 hours** with Activity book and revision of the

Start this lesson in progression with the previous grade.

Aim of the lesson:

The aim of this lesson is to understand that electricity comes from power stations and circulates in circuits through wires.

Learning objectives:

In this lesson students will know:

- Electricity generates from power stations.
- About conductors and insulators.
- Circuits have two type; Series or Parallel

Helping tools:

Teacher resource book will give you an ample support in teaching. Further, to prepare you for the lesson, visit the following sites:

- **The Net Extra.**

  Net extra is especially designed for the teachers and the students. Here you can find not only the text material but also the related information, activities and exercises. You can guide your students to use net extra for more information. Log on to net extra account at *www.learningwell.pk*

- **Other links:**

  Besides the Net Extra, here we mention links to other sites also which are **educational kids conceptual videos and activities** for elementary students to learn on the web.

  Visit:

  https://www.google.com/search?rct=j&q=electricityandthecircuits

  https://www.google.com/search?rct=j&q=conductorsandinsulators

Before you start a lesson in a class, give reading task of the lesson in homework to your students a day before. This reading task will help them understand the lesson. It will also help them realize the importance of pre-reading.

Warm up:

It's time to plough. Before you start a lesson, do brain storming of students to let them enthusiastically involve in creative thinking and thus in active learning. You may start up with a bunch of questions, e.g.

- Name five electrical appliances you see or use in your everyday life.
- What we call a device that opens or close a circuit?
- What we do when we have to turn on the fan?

(Note: there is more to ask)

Once you find your students excited to learn more, it's time to sow

Discussion:

The main aim of the lesson is to understand from where the electricity comes and how it generates. Power stations are the place where heavy generators can generate electricity and this electricity are called **main electricity**. These power stations supply electricity to our homes. Tell them some electrical appliances run on batteries. Things like mobiles phones, torches, remotes are powered by batteries and these devices are called **battery-operated devices.**

Once they understood how electricity generates, than you should tell them about conductors and insulators.

Conductors are those materials or objects in which electricity can flow freely. Gold, silver, aluminum, metals are some examples of conductors and these materials are called electrical conductors.

Insulators are those materials or objects which do not easily allow electricity or heat pass through them. Rubber, wood, glass, plastic are some examples of insulators and these are called electrical insulators. There are two types of electrical circuits **open** or **closed**. In closed circuit electric current can flow easily without any break. While the circuit in which there is a break for current flow is called an open circuit. Describe them the differences of series and parallel circuit how they work. Circuit diagrams are also given in the book for better understanding.

In class, let the students read the lesson aloud and underline difficult and the key words. Show them the pictures and ask them to explain in words.

Key words	Common words
power station	electricity
main electricity	appliances
battery-powered devices	generate
electrical conductors	disconnect
electrical insulator	current
open circuit	switch
close circuit	fatal
series circuit	threatening
parallel circuit	circuit
flow of electricity	symbols

Summary:

Summarize the lesson in points as:

- Electricity is the flow of current that makes electrical appliances run.
- Conductors allow electricity to pass through them. Insulators do not allow electricity to flow through them.
- The path of current flow is called an electric circuit.
- An open circuit is an incomplete circuit. A closed circuit is a complete circuit.
- A switch helps us to control the flow of current.
- In a series circuit, break in any point makes the whole circuit open.
- In parallel circuit, if a break in appoint occurs, other parts of the circuit remain closed.
- Showing the parts of a circuit using symbols is called a circuit diagram.

Assessment:

Once you find that discussion is completed, test the concepts of your student. You may ask:

- From where the main electricity comes?
- Name three devices that work on battery.
- Tell three electrical conductors.
- Which type of circuit have single path?
- Which type of circuits has multiple paths?
- Tell three electrical insulators.
- Tell five precautions that could save us from electric current.
- In which type of circuit components share the power of the battery?
- In which circuit currents can flow without any break?

(Note: there is more to ask)

Once your student has clear concepts of the related topic, it is time to reap.

Think and write (Prefer students' Answers)

1. Electricity appliances contain copper wires that allow electricity to passes through them.
2. Electricity cannot pass through them because they are insulators.
3. Parallel circuits are better than series circuits because if a break occurs in parallel circuit only affected area will stop working but if a break occurs in any point of series circuit the whole circuit will stop working.
4. Switches play an important role in a circuit, if there is no switch in a circuit to operate the circuit we have cut the wires every time when we want to switched off the bulb or fan.

Note for a teacher

Make sure students write answers themselves. You should check their concepts as well as their writing skills. It will help you and English language teacher to understand your students where they are week at and what to improve now.

For grade 5 students, answers should be simple and not be with complicated grammar structure.

Lesson Planner

G. Science Class - 4

Chapters	Time -min	Description	Total time min
Science and Its Major Fields	90	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	90	Activity book exercises	
Characteri Stics of Living Things	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Our Body Sciences	90	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	45	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
The Musculo skeletal System	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Balance Diet	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	180
	45	Discussion and assessment	
	45	Observatory + Think and write + Check if you know now	
	45	Activity book exercises	
Teeth	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Classifying Animals	90	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	45	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Habitat And Adaptation	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	180
	45	Discussion and assessment	
	45	Observatory + Think and write + Check if you know now	
	45	Activity book exercises	

Lesson Planner

G. Science Class - 4

Chapters	Time -min	Description	Total time min
Investigating Leaves	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	**360**
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Pollination and Fertilization	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	**360**
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Separating Mixture	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Investigating Atmosphere	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Friction And Resistance	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	180
	45	Discussion and assessment	
	45	Observatory + Think and write + Check if you know now	
	45	Activity book exercises	
Understanding Machines	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	
Electricity and the Circuits	45	Warm up, brain storming (with the help of You will need) and exercise given in book.	360
	90	Discussion and assessment	
	90	Observatory + Think and write + Check if you know now	
	135	Activity book exercises	