Dawood Public School
Course Outline 2019-2020
Science
Grade IV

Book and Work book:

- Marshall Cavendish Science (Pupil's Book 4)
- Marshall Cavendish Science (Activity Book 4)

Month	Syllabus Breakdown	Page numbers
August	How Magnets Work	82-99
September	Solids, Liquids and Gases	2-27
October	Habitats and Environments	52-81
November	**Revision for Mid-Year Examinations**	
December	**Mid-Year Examinations**	
January	Electrical Circuits Series and Parallel circuits (Topic from Science Smart 5)	100-123 (Handout)
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April	**Revision for Final Examinations**	
May	**Final Examinations**	

August

Chapter 4: How Magnets Work **Pages no: 82 - 99**

Contents	Learning Objectives
What is a Magnet? A piece of metal that can attract magnetic materials. • natural (loadstone) • man-made A magnet can be demagnetized by • hitting • dropping/throwing • heating	• Define magnet. • Name types of magnet. • Classify magntic and non-magnetic materials. • Name and draw the shapes of man-made magnets. • Identify and list the ways to demagnetize a magnet.
Properties of a Magnet • A maget has two poles: S-pole and N-pole. • The poles of a magnet hve the strongest pull or attraction. • Like poles repel each other, unlike poles attract each other.	• Label the poles of a magnet. • State the properties of a magnet. • Identify the strenght of a magnet.
Magnets and their uses Magnets can be used in: • daily life • recycling factories • scrap yard • compass to find direction	• List some ways in which magnets are used by humans. • Name the instrument that helps us to find direction.

Key Words:

lodestone, compass, needle, direction, north, south, east, west, holding, separating, lifting, recycling, attraction, repulsion,magnetic, non-magnetic, factory, scrap yard, electrical, flowing, magnetized, battery, demagnetized, pull, push, attract, repel.

Types of Questions

- Multiple choice questions
- True or false
- Fill in the blanks
- Short question/answers
- Sorting of magnetic and non-magnetic materials
- Labeling of diagrams

Sample Questions:

1. Compare the difference between magnetic materials and non-magnetic materials with two examples of each.

Magnetic materials	Non-magnetic materials

2. Which of the following materials can be attracted by the magnet? Circle them.
   a. steel
   b. fabric
   c. wood
   d. gold

3. Identify the given types of magnets.

Workbook Activities:

- Worksheets # 1, 4 and 5

Activities/Experiments

- Students will collect different materials like steel, paper, wood, aluminum foil to identify which materials can be attracted by a magnet.
- Students will be shown different shapes of magnets.
- Students will use a toy car with a bar magnet for observing attraction and repulsion.

Creative Applications:

- To observe force of attraction between different types of magnets.
- To compare the strengths of two magnets.
- To plan and carry out an investigation to find out whether all metals can be attracted by magnets.
- To make compass through a magnetized needle.

ITSurf:

- http://www.coolmagnetman.com/magnindex.htm
- http://science.ppst.com/magnets/html

<u>September</u>

Chapter 1: Solids, Liquids and Gases **Pages no: 2 - 27**

Contents	Learning Outcomes
What is matter? Anything that has mass and occupies space is called Matter. The things that do not have mass and volume are called non-matter. **Mass** The amount of matter in an object is called Mass. **Volume** The amount of space occupied by matter is called Volume.	• Define the following terms: ➢ matter ➢ non-matter ➢ volume ➢ mass • Provide examples for the following: ➢ matter ➢ non-matter • Classify the given list of materials into matter and non-matter. • State the measuring unit for mass. • List the measuring instruments which are used to assess mass. • List the measuring instruments which are used to assess volume.
Physical States of Matter There are three state of matter • Solid • Liquid • Gas	• List the properties of solids, liquids and gas. • Differentiate between solids, liquids and gases on the basis of their properties. • Draw the particle arrangement model of solids, liquids and gas.

Can matter change in state? **Changes of state** • Heat gain or heat loss can cause changes in state. Water exists in three different states as; • Solid • Liquid • Gas	• Understand that heating or cooling is needed for a change of state to take place from one state of matter to another state. • Recognize that water exists in three interchangeable states of matter. • Describe how a matter may change its state.
When water gains heat • Melting is a change of solid into liquid. • Boiling is a change of liquid into gas.	• Define 'boiling' and boiling point of water. • Define 'melting' and melting point of water. • Describe what happens when water gains heat.
When water loses heat • Freezing is a change of a liquid into a solid. • Condensation is a change of a gas into a liquid.	• Define 'freezing' and freezing point of water. • Define 'condensation'. • Describe what happens when water loses heat.

Key Words:
freezing, condensation, melting, boiling, evaporation, variable, temperature, condense, matter, mass, volume, milliliters, liters, cubic centimeters, measuring cylinder, kilograms, grams, electronic balance, lever balance, thermometer

Types of Questions:

- Multiple Choice questions
- Differences between different processes
- Questions with illustrations
- Descriptive questions
- Labeling of diagrams

Sample Questions:

1. Multiple choice questions.
   a) Sarah filled a container with water in Figure 1 below. When she put an egg into the container, some water overflowed into beaker A as shown in Figure 2.

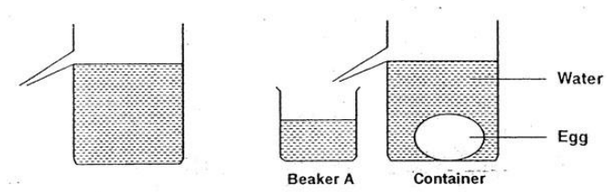
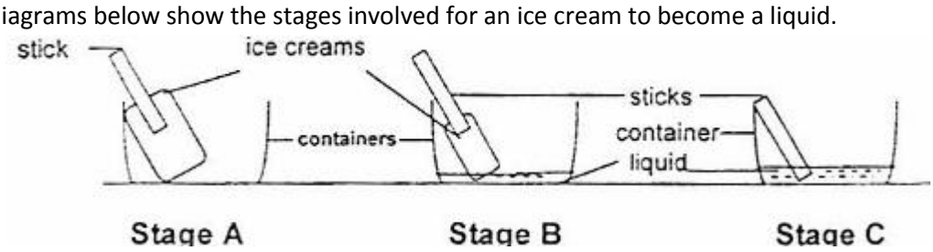


Figure 1 Figure 2

The experiment shows that an egg _____.

A. Has mass
B. Has a definite volume
C. Has no definite shape
D. Cannot be compressed

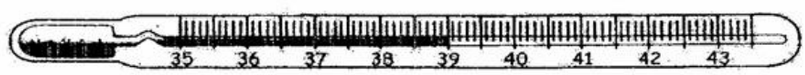
2. The diagrams below show the stages involved for an ice cream to become a liquid.



Based on the information above, which one of the following statements is **correct?**

A. The container gains heat from the ice cream.
B. The container loses heat to the surrounding air.
C. The ice cream loses heat to the surrounding air.
D. The ice cream gains heat from the surrounding air.

3. The diagram below shows a thermometer.



(a) Name the type of thermometer shown in the diagram above.

_____

(b) What is the temperature shown on the thermometer?

_____

Workbook Activities:

- Worksheets #1-6

Activities/Experiments:

- Student will identify the properties of solid, liquid and gas e.g. compressibility, flowing, shape and volume etc.
- Students will make popsicles to observe freezing of liquid.
- Students will observe melting of chocolate in their hands.
- Students will observe and identify different temperatures using laboratory thermometer.

Creative Applications:

- To examine the diffusion rate in hot and cold water.
- To examine the inflation of balloon with CO2 produced in reaction of vinegar and baking soda.
- To separate the mixtures through the process of filtration.
- To investigate the compressibility of three states of matter.

IT Surf:

- https://www.youtube.com/watch?v=C33WdI64FiY
- https://www.youtube.com/watch?v=Nzs_Oc_dzps
- https://www.youtube.com/watch?v=yjJ3eSD77zE

<u>October</u>

Chapter 3: Habitats and Environments **Pages no**: **52 - 81**

Contents	Learning Objectives
Habitat Habitat is a place where organisms lives and find food, shelter, protection and mates. Types of habitats: • Aquatic • Terrestrial	• Define 'habitat'. • Name the four components of habitat. • Name the two basic types of habitat found on Earth. • Name different examples of habitat. • Categorize different habitat according to their types. • Identify the habitat for a given variety of organisms.
Flora and Fauna Animals of a particular area/ region are called fauna and plants of a particular area/region are called flora.	• Define the following terms: ➢ flora ➢ fauna • Differentiate between flora and fauna. • Name flora and fauna of different habitats.

Adaptations Adaptation is an alteration in the structure or function of an organism or any of its parts by which the organism becomes better suited to survive and multiply in its environment. • Adaptations of camel • Adaptations of birds • Adaptations of polar bear • Adaptation of mudskipper • Adaptations of fish	• Define 'adaptations'. • Describe the adaptations of the following organisms: ➢ camel ➢ polar bear ➢ mudskipper ➢ birds ➢ fish • Describe what will happen if an organism is unable to adapt a habitat. • Explain the features of the following organisms: ➢ camel ➢ polar bear ➢ fish ➢ mudskipper ➢ birds
Identification key An aid or toll used to identify or classify living things.	• Describe the purpose of an 'identification key'. • Identify different organisms by using an identification key.
Invertebrates and Vertebrates • Animals without backbone/spinal cord are called invertebrates. • Animals with backbone/spinal cord are called vertebrates.	• Define the following terms: ➢ identification key ➢ vertebrates ➢ invertebrates • Classify vertebrates and invertebrates by using identification key.
Changing Habitat Habitats rarely stay the same. When it rains, plants are green and colorful flowers appear. When the rain stops, plants turn brown and lose their leaves. Over longer periods of time, some species disappear and new species take their place. Sometimes the actions of people can also change habitats. However human activities harm the environment.	• Define the following terms: ➢ deforestation ➢ erosion ➢ pollution ➢ pollutant • Describe how habitats may change. • Describe the effects of changes in habitat. • Describe why deforestation may take place. • State the effects of deforestation. • State the effects of soil erosion. • List the various types of pollution. • List the various types of pollutants. • Explain the phenomenon of oil spills and describe its consequences.
Taking care of the environment Environment can be made clean and safe for the living organisms by following ways. • Planting trees • Cleaning up litter from the surrounding • Taking public transport • By practicing 'R's i.e. Reduce, Reuse and Recycle	• Describe how humans can harm the environment. • List some ways to keep the environment clean and safe for the living organisms. • State the three 'R's. • Describe some lifestyle choices which would involve: ➢ reducing ➢ reusing ➢ recycling

Key Words:

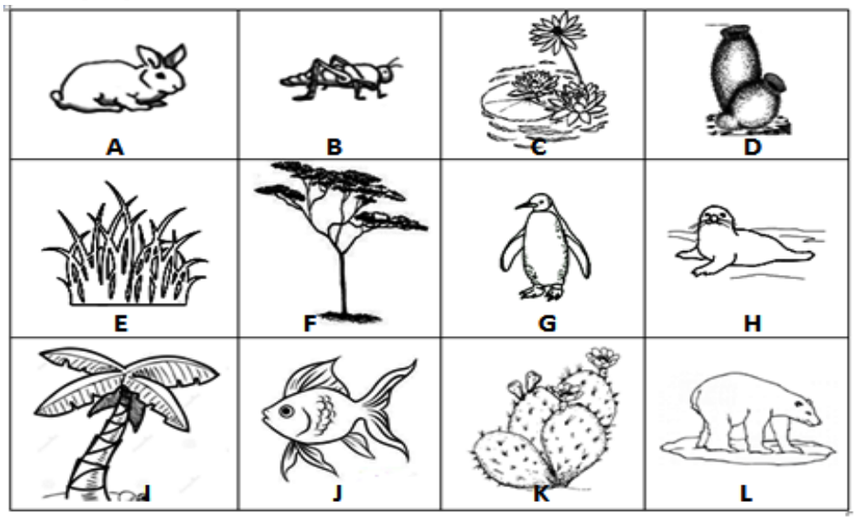
organisms, flora, fauna, habitat, grassland, tundra, rotting log, invertebrates, vertebrates, backbone, adaptations, conserve, gills, fins and tail, streamlined body, smoke, harmful gases, toxic metals, wastes, garbage, oil spill, mangrove swamp, deforestation, pollution, reduce, reuse, recycle.

Types of Questions:

- Multiple Choice questions
- Short reasoning questions
- Questions with illustrations
- Descriptive questions
- Labeling of diagrams

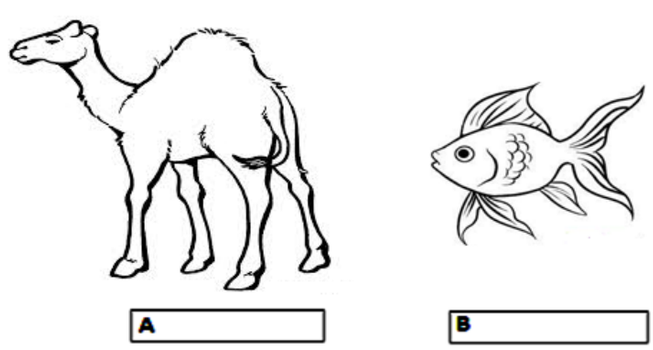
Sample Questions:

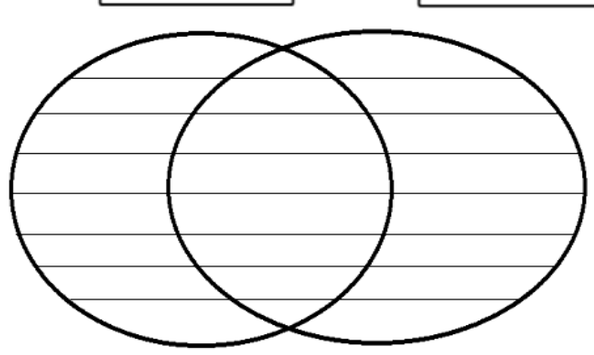
1. Classify following organisms into flora and fauna.



Flora	Fauna

2. Label the diagram of these faunas and compare the adaptations of the following.





Workbook Activities:

- Worksheets #1-7

Activities/Experiments:

- Students will go around the school to identify different habitats and their flora and fauna.
- Students will clean up their desks, class cupboard and class and identify the items that can be reused or recycled.
- Students will work in groups to make small waste bins for their class under thetitles, Reduce, Reuse and Recycle.

Creative Application:

- To investigate the balloon filled with water doesn't blow up.
- To investigate the importance of breathing to live.
- To investigate the procedure for cleaning oil spill over water.
- To examine the air as matter.

IT Surf:

- https://www.youtube.com/watch?v=CxrlEajA398
- https://www.youtube.com/watch?v=9SS0pYZRNZw
- https://www.youtube.com/watch?v=LB8nLZmxN_M
- https://www.youtube.com/watch?v=2j_aXQoLe-o

November:

Revision for Mid Year Examination

December:

Mid Year Examination

January

Chapter 5: Electrical Circuits **Pages no: 100 - 123**

Contents	Learning Objectives
What is electricity Electricity is a form of energy that enables things to work.	• Define 'electricity'. • Develop awareness that alternative sources are available to generate electricity.
Electric circuits Components of a circuit: • battery or cell • bulb • wires • switch	• Describe an electric circuit. • List the components required to form an electrical circuit.
Open and closed circuit There are different types of circuits which can be used to provide energy for electricity: • A circuit with a gap is called an open circuit. • A circuit without any gap is called a closed circuit.	• Identify and differentiate between an open and a closed circuit.
Switches, battery and a bulb • Switch is used to open and close an electric circuit. • Battery is used to provide electrical energy to the circuit. • Bulb lights up when an electric current flows through it.	• Identify a switch, battery and a bulb in a circuit. • Describe the use of the following: ➢ switch ➢ battery ➢ bulb

	• Predict what would happen if any component of a circuit is missing.
Factors affecting an electric circuit • More the number of batteries, the brighter the bulb • More bulbs connected one after another, the dimmer the bulbs	• Describe the factors that can affect the brightness of a bulb in an electric circuit. • Suggest what happens if there are: ➢ multiple bulbs ➢ multiple batteries
Motors and buzzers • A motor works when its axle moves due to the electric current flows through it. • A buzzer makes sound when electric current flows through it.	• Identify a motor and buzzer in a circuit. • Describe the use of motor and buzzer in a circuit. • Describe the role of an axle in a motor.
Using electricity safely Safety is very important when using electricity.	• Explain why safety is very important. • List some safety measures of using electricity.
Types of electric circuits (from Handout) • **Series circuit:** All components are connected in **series** so that they all share the same current. • **Parallel circuit:** All components are connected between the same two sets of electrically common points, creating multiple paths for the current to flow from one end of the battery to the other.	• Describe the following: ➢ series circuit ➢ parallel circuit • Suggest where a series circuit may be used. • Suggest where a parallel circuit may be used.

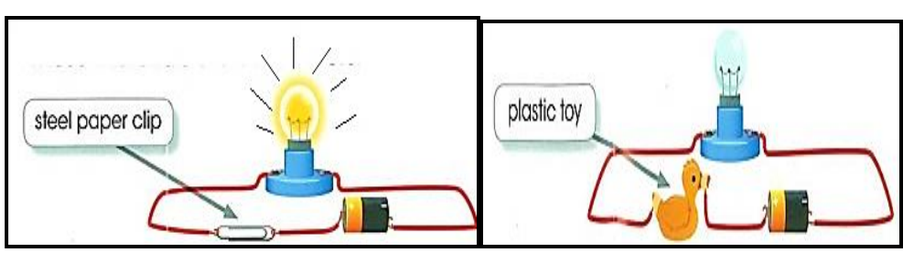
Key Words:
positive, negative, circuit diagram, buzzer, motor, electric circuit, components, electric current, factors, brightness, switch, electric shocks

Types of Questions:

- Multiple Choice questions
- Short reasoning questions
- Questions with illustrations
- Descriptive questions
- Labeling of diagrams

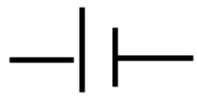
Sample Questions:

1. Look at the given circuits and state the difference between them.



Circuit A	Circuit B

2. Write down the names of circuit components for the given symbols.

Symbols	Name of components
	
	
	
	
	
	
	

Workbook Activities:

- Worksheets # 1, 6 and 7

Activities/Experiments:

- Students will make a closed or an open circuit using the following basic components:
  - wires
  - battery
  - bulb
  - switch
- Students will work in group to make a toy motor boat or a car using simple batteries, motor, wheels and wires.

Creative Applications:

- To analyse the electric circuit in a steady hand game.
- To set up a closed circuit.
- To set up an electric circuit with a switch.
- To identify the variables to change and the variables to keep same for investigations on electric current.

IT Surf:

- http://www.bbc.co.uk/schools/scienceclips/ages/8_9/circuits_conductors_fs.shtml
- https://www.britannica.com/technology/electric-circuit

<u>February</u>

Chapter 2: Skeleton and Muscles **Pages no: 27 - 51**

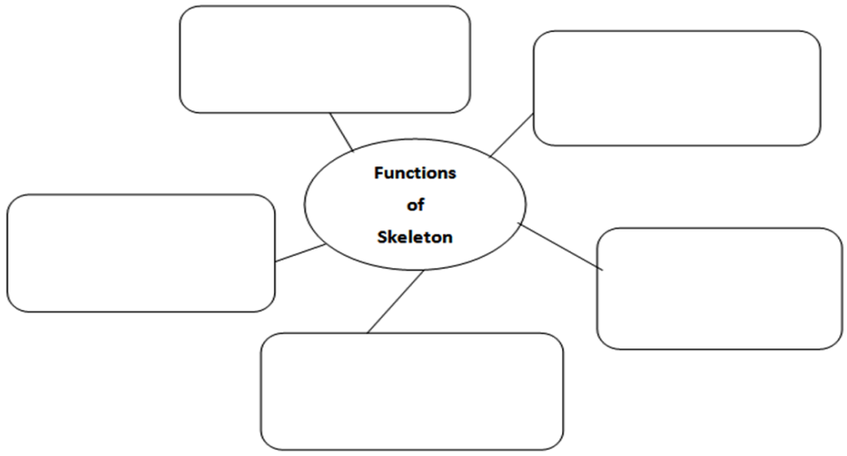
Contents	Learning Objectives
The Human Skeleton The human skeleton is the internal framework of the body comprised of 206 bones.	• Define 'skeletal system'. • List the functions of a skeleton. • Identify, label and learn the scientific and

Invertebrates and Vertebrates • Animals without backbone/spinal cord are called invertebrates. • Animals with backbone/spinal cord are called vertebrates.	common names of the different bones of the skeleton. • Explain why the number of bones in a baby is less than that of an adult human being. • Differentiate between vertebrates and invertebrates.
Fractures Broken bones are called fractures.	• Describe a 'fracture'. • Suggest how a fracture might be caused • State how a broken bone can be identified in a human body.
Muscles Muscles are tough and elastic fibres found in the animals that contract and relax, enabling movement. **Joints** Joint is the point where two or more bones meet.	• Define the following: ➢ muscles ➢ joints ➢ bicep ➢ triceps • Identify, label and learn the names of the skeletal muscles found in the human body. • Describe the movement of biceps and triceps.
Drugs Drugs are the substances that can change the way the body behaves when taken into the body. Medicinal drugs can be of three types: • antibiotic • antiviral • vaccines	• Define the term 'drug'. • Recognize the harmful and useful drugs. • Develop awareness that any medicine must only be used after doctor's advice. • List the three basic types of medicinal drugs. • Describe the purpose of a 'vaccine'. • Develop awareness that all children must be injected with essential vaccines. • Describe the harmful effects of tobacco on human health. • List some common diseases caused by prolonged use of tobacco. • Name some basic medicinal drugs and suggest their use.

Key Words:
framework, skeleton, scientific names, common names, protection, support, vertebrae, backbone, skull, cranium, scapula, shoulder blade, clavicle, collar bone, patella, knee cap, sternum, pelvis, radius, ulna, humerus, phalanges, tibia, fibula, femur, carpals, tarsal, bone marrow, ribcage, brain, lungs, heart, biceps, triceps.

Types of Questions:
- Multiple Choice questions
- Short reasoning questions
- Questions with illustrations
- Descriptive questions
- Labeling of diagrams

Sample Questions:
1. Write the functions of the human skeleton.



2. Describe the movement of biceps and triceps.

Workbook Activities:

- Worksheets # 1-8

Activities/Experiments:

- Students will observe, identify and learn the bones of human skeleton.
- Students will study the X-ray of different body parts and observe fractures.
- Students will use a measuring tape or ruler to find out their height and will compare with their classmates.
- Students will observe the contraction and relaxation of biceps and triceps by holding/lifting different objects within the class e.g. chair, bag, book etc.

Creative Applications:

- To design and build a working hand out of craft materials that demonstrates how a real robot hand might work.
- To observe contraction and relaxation of muscles while pulling and releasing the rope of a pulley.
- To aligned/ articulate bones of human body in a proper skeletal system.
- To observe the change of heart rate after some physical activities.

IT Surf:

- https://www.youtube.com/watch?v=lUP-D4dKp14
- https://www.youtube.com/watch?v=i42FSNA9bAY
- https://www.youtube.com/watch?v=ChhPpAKKqHI
- https://www.youtube.com/watch?v=C6u0u_59UDc

March

Chapter 6: Sound **Pages no: 124 - 153**

Contents	Learning Objectives
How are sounds made? Sounds are made when things or air vibrate. Sounds are made by ; • plucking • hitting • beating • shaking	• Investigate how sounds are made when things or air vibrate. • List different ways of producing sounds.
Vocal cords vibrate and make sounds The vocal cords in our voice-box vibrate and make sounds when we talk or sing.	• Identify the body part which produces sound. • Explain the way by which vocal cords produce sound.
Sounds need a medium to travel Sounds need a medium to travel such as; • solid • liquid • gas	• Identify the mediums of sound through which it travels. • Explain how sound uses a medium to travel.
Soft and loud sounds Small vibrations produce soft sounds where as large vibrations produce loud sounds. A sound level meter is used to measure a sound level. Sound levels are measured by the unit decibel (dB).	• Differentiate between soft and loud sounds with examples. • Name an instrument that is used to measure sound levels. • State the range of sound pleasant for human ear.
Noise Unpleasant sounds are called noise. There are some ways to reduce noise; • shutting doors and windows • by using noise barriers • hanging curtains • by using carpets and soft cushions	• Define 'noise'. • List the different ways to reduce noises. • Suggest some reasons why noise should be reduced. • Suggest some places where loud sounds may be required.
Pitch Pitch is the rate at which vibrations are produced. • A high pitched sound is made when a thing or material vibrates quickly. • A low pitched sound is made when a thing or material vibrates slowly. Pitch is different from loudness and volume.	• Define 'pitch'. • Describe how high pitched sounds are made. • Describe how low pitched sounds are made. • List the name of animals which produce: ➢ low pitched sound ➢ high pitched sound • Differentiate between loudness and pitch.
Pitch can be changed in musical instruments String instruments make sounds when the strings vibrate. Wind instruments make sounds when the column of air in the instruments vibrates. Percussion instruments make sounds when they are hit or shaken.	• List three different types of musical instruments. • Describe how sound is produced by the following: ➢ string instruments ➢ wind instruments ➢ percussion instruments

Key Words:
vocal cords ,decibel, sound-level meter, noises, pitch, high-pitched, low-pitched, tuning fork, prongs, instrument, percussion, loudness, string

Types of Questions:

- Multiple Choice questions
- Differences
- Short reasoning questions
- Experimental questions
- Drawing of sound waves
- Labeling of structure of human ear.

Sample Questions:

1. Look at the following picture below.

   a. Which string of the guitar will produce a high pitched sound?

   _____

   b. Which string of the guitar will produce a low pitched sound?

   _____

2. Fill in the blanks.

   a. _____ is made by vibrations.
   b. Vibrations happen when something move _____.
   c. Sound _____travel through the air.
   d. When sound waves are big the sound is _____.
   e. When sound waves are small the sound is _____.

3. Explain the following statements with examples.

   a. The loudness of a sound affects the pitch of the sound.

   _____

   b. Sound travel fastest in solids as compare to liquids and gases.

   _____

4. Differentiate between pleasant and unpleasant sounds with examples.

Pleasant sound	Unpleasant sound

Workbook Activities:

- Worksheets #2, 4, 5, 6, 7 and 8

Activities/Experiments:

- Students will be asked to make telephone by using two plastic or paper cups and a long string.
- Students will use different musical instruments to produce and identify sounds of different pitches.
- Students will work in groups to observe the sounds produced by a guitar.

Creative Applications:

- To produce sound with the help of different objects.
- To find out how a turning fork makes sounds.
- To find out whether sound can travel through solid, liquid and gas.
- To make a panpipe.

IT Surf:

- https://www.youtube.com/watch?v=AGjxfx8sy6s
- https://www.youtube.com/watch?v=HMXoHKwWmU8

April

Revision for Final Examination

May:

Final Examination