Dawood Public School
Course Outline 2017-18
General Science
Class IV

Month	Syllabus Breakdown	Reference Book
August	Habitat	International Primary Science Book 4 Chapter 01
September	Solids and Liquids	International Primary Science Book 4 Chapter 05
October	Moving and Growing	International Primary Science Book 4 Chapter 02
November	Revision for Mid Term Examinations	Worksheets
December	Mid Term Examinations	
January	Discovering Plants	International Primary Science Book 4 Chapter 06
February	Friction and How Objects Move	International Primary Science Book 4 Chapter 03
March	Keeping Warm	International Primary Science Book 4 Chapter 04
April	Revision for Final Examinations	Worksheets
May	Final Examinations	

August

Chapter 1: Habitat **Pages: 1-30**

Contents	Learning Outcomes
1.1 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.
1.2 Flora and Fauna Animals of a particular area/ region are called fauna and plants of a particular area/region are called flora.	• Define flora and fauna. • Name flora and fauna of different habitats.
1.3 Levels of Organizations The highest level pf organization of living things are arranged from the simplest to complex. Organism, Population and Community.	• Define: ➢ Organization ➢ Population ➢ Community • Compare the terms organism, population and community. • Identify and categorize the level of organization by observing any given group of organisms.
1.4 Invertebrates Animals without backbone/spinal cord, are called invertebrates.	• Define invertebrates. • Enlist the characteristics of invertebrates. • Identify the invertebrates from the group of organisms.
1.5 Producers and Consumers Plants are called producers because they can make their own food while animals are called consumers because they depends on others.	• Define producers and consumers. • Differentiate between producers and consumers. • Categorize producers and consumers from given group of organisms. • Describe the food source of producers and consumers.
1.6 Types of Consumers Animals are categorized into three types on the basis of their type of food consumption. • Herbivores • Carnivores • Omnivores	• Define: ➢ herbivores ➢ carnivores ➢ omnivores • Identify herbivores, carnivores and omnivores by the shape of their teeth. • Give examples of herbivores, carnivores and omnivores. • Sort different types of consumers from given organisms.

1.7 Food Chain A food chain is a linear sequence, showing feeding relationship between the organisms.	• Define food chain. • State the characteristics of food chain. • Construct 4 – 5 linked food chains. • Describe the impact and effect of a disturbance in food chains. • Identify the energy source in a food chain.
1.8 Adaptations Adaptation is an alteration in the structure or function of an organism or any of its parts by which the organism becomes better fitted to survive and multiply in its environment. • Adaptations of Camel. • Adaptations of Cactus. • Adaptations of Waterlily. • Adaptations of Fish.	• Define adaptations. • Describe the adaptations of different organisms (specifically camel, cactus, water lily and fish) to help them survive in their particular habitat. • Describe what will happen if an organism is unable to adapt a habitat. • Explain how the features of organisms (specifically camel, cactus, water lily and fish) enable them to adapt to a particular habitat.
1.9 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.	• Describe how habitats change. • Explain the effects of changes in habitat. • Define deforestation. • State the effects of deforestation. • Give reasons for deforestation. • Define soil erosion. • State the effects of soil erosion. • Define pollution. • Name types of pollution. • Define pollutants. • Explain the phenomenon of oil spills and describe its consequences.

Key words:
organisms, flora, fauna, habitat, grassland, tundra, population, community, rotting log, invertebrates, vertebrates, backbone, segments, adaptations, conserve, evaporating, spines, reduce water loss, gills, fins and tail, streamlined body, smoke, harmful gases, toxic metals, wastes, garbage, oil spill.

Types of Questions:
- Multiple Choice Questions.
- Structural Questions.
- Short Reasoning Questions.
- Descriptive Questions.

Workbook Activities/Experiments:
- Activity 1.1 (Exploring Habitat)
- Activity 1.2 (Collecting and observing Invertebrates)
- Activity 1.4 (Adaptations of garden animals)
- Activity 1.6 (Cleaning up an oil spill).

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https://www.youtube.com/watch?v=dG1kTNPo8x4
https://www.youtube.com/watch?v=9SS0pYZRNZw
https://www.youtube.com/watch?v=LB8nLZmxN_M
https://www.youtube.com/watch?v=2j_aXQoLe-o
https://www.youtube.com/watch?v=MquNoZqX5WM

September

Chapter 5: Solids & Liquids **Pages: 115-150**

Contents	Learning Outcomes
5.1 Matter Matter is any substance that has mass and takes up space by having volume. Mass and Volume are the two basic characters of matter.	• Define matter. • Differentiate between mass and volume. • Name the instruments used to measure mass and volume. • Write the standard units used for measuring mass and volume. • Measure the volume of liquids provided in measuring cylinders. • Calculate the volume of different objects by using measuring cylinders through displacement method.
5.2 States of Matter There are three states of matter: • Solids • Liquids • Gases	• Compare the properties of three states of matter. • List the differences and similarities of three states of matter. • Draw the particle arrangement of solids, liquids and gases. • Prove with the help of the common examples that gases are matter. • Give reasons of the fluidity of liquids and compressibility of gases. • Give reason of the compressibility of a sponge despite of its solid state.
5.3 Freezing & Melting These are examples of changes in the state of matter of substances. Substances freeze at exactly the same temperature as they melt. The temperature at which liquids and solids exist in equilibrium is defined as melting and freezing point.	• Define freezing. • Define melting. • Differentiate between freezing and melting in terms of gain and loss of energy. • Identify the objects that gain or lose heat/energy, when substances of different temperatures are added into them. • State the melting and freezing point of water. • Identify the different states of water at different temperatures.
5.4 Reversible & Irreversible Changes The changes which cannot be undone/reversed are called reversible changes while the changes that can be reversed are called Irreversible changes.	• Differentiate between reversible and irreversible changes. • Give examples of reversible and irreversible changes.

5.5 Mixing and separating solids and liquids. Mixture is a material made up of two or more different substances which are not chemically combined. • Mixture can be separated by sieving and filtration. • Solids and liquids that are dissolved and form a solution can be separated by distillation.	• Define: ➢ solute ➢ solvent ➢ solution ➢ soluble substances ➢ insoluble substances ➢ mixtures • Give examples of soluble and insoluble substances. • Differentiate between solution and mixtures. • Name the process through which dissolved substances are separated. • Describe the process of filtration. • Differentiate between residue and filtrate. • Identify the solute, solvent, solution, mixture, residue and filtrate in diagrams. • State the role of the filter paper in the process of filtration.

Key words:
matter, mass, volume, milliliters, liters, cubic centimeters, measuring cylinders, kilograms, grams, electronic balance, lever balance, definite, compressibility, water vapor, heat gain, heat loss, temperature, freezing point, melting point, reversible changes, irreversible changes, soluble substances, insoluble substances, solute, solvent, solution, residue, filtrate, evaporation, mixtures.

Types of Questions:
- Multiple Choice Questions.
- Structural Questions.
- Short Reasoning Questions.
- Descriptive Questions.

Workbook Activities/Experiments:
- Activity 5.1 (Finding the mass of objects).
- Activity 5.2 (Is air matter?)
- Activity 5.4 (Does a liquid have a definite shape and volume?)
- Activity 5.5 (Can water be compressed?)
- Activity 5.7 (Losing its cool)
- Activity 5.8 (Separating mixtures)
- Activity 5.9 (What can dissolve in water?)

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https://www.youtube.com/watch?v=Nzs_Oc_dzps
https://www.youtube.com/watch?v=yjJ3eSD77zE
https://www.youtube.com/watch?v=r8M7mah_QaY
https://www.youtube.com/watch?v=mFGv_d6h45U

October

Chapter 2: Moving and Growing **Pages: 31-56**

Contents	Learning Outcomes
2.1 The Human Skeleton The human skeleton is the internal framework of the body comprised of 206 bones that can be categorized according to their different types. There are four types of bones; • Long bone • Short bone • Flat bone • Irregular bone	• Define skeletal system. • List the functions of the skeleton. • Identify, label and learn the scientific and common names of the different bones of the axial and appendicular skeleton. • Classify bones according to their types. • List some facts about the human skeleton. • Explain why the number of bones in a baby is less than that of an adult human being. • State the function of bone marrow. • Name the nutritional components that are used to strengthen bones. • Compare the human skeleton with the skeleton of other animals.
2.2 Types of skeleton There are three different types of skeleton systems that fulfils the requirement of the different organisms; • Endoskeleton • Exoskeleton • No skeleton	• Compare the three types of skeleton. • Classify the animals with exoskeleton, endoskeleton or no skeleton from given group of animals. • Give examples of animals with exoskeleton, endoskeleton or no skeleton.
2.3 Joints Joint is the point where two or more bones meet. There are three types of joints; • Immovable Joints ➢ Skull ➢ Pelvis • Movable Joints ➢ Ball and Socket Joint ➢ Hinge Joint ➢ Saddle Joint ➢ Pivot Joint	• Define joints. • Compare the three different types of joints. • Identify and label the types of joints at different parts of the body. • Describe the movement of the different types of joints. • Give examples of the different places where a specific type of joint is found. • State the functions of ligaments.
2.4 Muscles and Tendons Muscles are soft tissues found in the animals they contract and relax enabling to movement. Tendons are the cords that connects muscles to bone.	• Define muscles. • Identify, label and learn the names of the skeletal muscles found in the human body. • Describe antagonistic movement of biceps and triceps. • Identify the skeletal muscles and tendons. • Define tendons. • Differentiate between ligaments and tendons. • Narrate the story of Achilles.

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, tarsals, bone marrow, ribcage, brain, lungs, heart, ball and socket joint, hinge joint, pivot joint, saddle joint, biceps, triceps, boredom, tendons, Achilles.

Types of Questions:
- Multiple Choice Questions.
- Structural Questions.
- Short Reasoning Questions.
- Descriptive Questions.

Workbook Activities/Experiments:
- Activity 2.3 (Comparing the human and frog skeleton).
- Activity 2.5 (Make a Skeleton)

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https://www.youtube.com/watch?v=i42FSNA9bAY
https://www.youtube.com/watch?v=ChhPpAKKqHI
https://www.youtube.com/watch?v=0cYal_hitz4
https://www.youtube.com/watch?v=C6u0u_59UDc

November

Revision for Mid Term Examinations

December

Mid Term Examinations

January

Chapter 6: Discovering Plants **Pages: 153-190**

Contents	Learning Outcomes
6.1 Parts of a Plant Plants are made up of four basic parts that play an important role in their growth and development. • Flowers/Fruits • Leaves • Stems • Roots	• State the functions of different parts of a plant. • Describe the effect on a plant in the absence of its parts (Flower/Fruit, Leaves, Stem, Roots)
6.2 Roots Root is the organ of a plant that lies below the surface of the soil. The first root that comes from a plant is called the radicle. A root's major functions are absorption of water and nutrients. Roots anchor the plant body to the ground, support it and help to store food and nutrients. There are two types of roots; • Fibrous roots • Tap root There are three parts of the roots; • Root hair • Root tip • Root cap	• Describe the functions of the roots. • Differentiate between the two types of roots. • Give examples of plants that have tap and fibrous root system. • Categorize plants with tap and fibrous roots from group of plants. • State the function of different parts of the roots. • Describe the effect on root function in the absence of any of its parts. • Identify and label the parts of roots. • Give reason why roots of a plant get swollen. • State the names of some edible roots.

6.3 Stem The plant stem is a component of the shoot system.The main function is to provide support to the plant, holding leaves, flowers, and buds; in some cases stems also store food for the plant. The stem of the plant connects the roots to the leaves, helping to transport absorbed water and minerals to different parts of the plant. The tubes of the stem responsible for the transportation of water and minerals; • Xylem • Phloem There are two types of the stem; • Woody stems • Non woody stems	• Describe the functions of the stem. • State the functions of the xylem and phloem. • Identify the position of xylem and phloem in the vascular bundles. • Construct a flow chart on the types of stems. • Differentiate between woody and non woody stem. • Give examples of plants with woody and non woody stem. • Give a reason for swollen stem with examples (underground stem). • Differentiate between climbers and creepers. • Give examples of climbers and creepers.
6.4 Leaves Leaves are the parts of the plant that are responsible for making food through the process of photosynthesis. There are four basic parts of the leaves; • Leaf blade • Branch leaf vein • Main leaf vein • Leaf stalk Leaves are classified into many types on the basis of their structure; • Colors of leaves • Shape of leaves • Sizes of leaves • Vein of leaves • Edges of leaves • Texture of leaves	• Describe the function of leaves. • Identify and label different parts of the leaves. • State the function of different parts of leaves. • Differentiate between hibiscus and orchid leaf. • Construct a flow chart describing the different types of leaves. • Classify the different leaves on the basis of their respective type. • Describe the shape, size, color, veins, edges, textures of different leaves. • Describe the process of photosynthesis. • Write the word equation about the process of photosynthesis. • State the role of chlorophyll. • State the importance of sunlight during the process of photosynthesis.

6.5 Flowers
Flowers are the parts of the plants responsible for reproduction; they turn into fruit after fertilization.
They following parts of the flower play an important role in reproduction;
• Petal
• Sepal
• Pedicel
• Pistil
  ➢ Stigma
  ➢ Style
  ➢ Ovary
  ➢ Ovule
  ➢ Eggs/Female reproductive cells
• Stamen
  ➢ Pollen
  ➢ Anther
  ➢ Filament
Plants undergo the following processes for its reproduction;
	• Describe the functions of the flower.
	• Identify and label the different parts of flower.
	• State the functions of the different parts of the flower.
	• Analyze the absence of different parts of the flower affecting plant reproduction.
	• Define unisexual and bisexual flower.
	• Differentiate between unisexual and bisexual flower.
	• Describe the process of pollination.
	• Differentiate between wind pollinated and insect pollinated flowers.
	• Give examples of the wind and insect pollinated flower.
	• State the distinct characteristics of Titan arum and Rafflesia flower.
	• Describe the process of fertilization.
	• Explain what happens to each part of a

• Pollination • Fertilization • Seed Dispersal • Germination	flower after fertilization. • Name some edible and inedible fruits. • Name some fruits that are regarded as vegetables.

Key words:
roots, stem, leaves, flower, fruits, photosynthesis, chlorophyll, transportation, minerals, absorption, reproduction, nutrients, firmness, anchor, root hair, root tips, branch root, xylem, phloem, clasping roots, buttress roots, tap roots, buttress roots, woody stem, non woody stems, climbers, creepers, vines, leaf blade, midrib, branch veins, leaf stalk, toothed edges, parallel veins, netlike veins, carbon dioxide, oxygen, pigment, raw material, byproduct, green pigment, petal, sepal, pedicel, pollen, anther, filament, stamen. pistil/carpel, stigma, style, ovary, ovule, female reproductive cells/eggs, pollination, fertilization, unisexual, bisexual.

Types of Questions:
- Multiple Choice Questions.
- Structural Questions.
- Short Reasoning Questions.
- Descriptive Questions.

Workbook Activities/Experiments:
- Activity 6.1 (Observing and identifying the parts of plants)
- Activity 6.2 (Observing tap and fibrous roots system)
- Activity 6.3 (What do stem do?)
- Activity 6.5 (Comparing Leaves)
- Activity 6.6 (Classifying leaves)
- Activity 6.8 (Identifying the parts of flower)
- Activity 6.10 (Collecting Fruits and seeds)

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https://www.youtube.com/watch?v=yHVhM-pLRXk
https://www.youtube.com/watch?v=HuKa57OJ_iA
https://www.youtube.com/watch?v=djPVgip_bdU
https://www.youtube.com/watch?v=aXT1DZEHsMk

February

Chapter 3: Friction and how objects move **Pages 59-83**

Contents	Learning Outcomes
3.1 Friction Friction is the force resisting the relative motion of solid surfaces, fluid layers, and material elements sliding against each other. Or Friction is a force that opposes the relative lateral motion of two solid surfaces in contact.	• Define friction. • Describe the importance of friction. • Analyze situations without friction. • State the characteristics of friction. • State some ways to reduce friction. • Give reasons for the following scenarios; ➢ Why the moving parts a machine gets warmer. ➢ Why the car's engine is bathed in the oil. ➢ Why a match stick catches fire. ➢ Why the tread pattern of a shoe's sole or tires wear out. ➢ Why oil is applied on door hinges.

3.2 Factors Affecting Friction. Friction is affected by the following factors; • Surface area • Type of surface • Weight	• Define fair test. • State the characteristics of the fair test. • Investigate a test. • Describe the aim of the fair test. • Draw conclusions from described experiments. • Identify the changed variables in fair test. • Identify the constant variables in fair test. • Design a fair test with respect to a given aim. • Describe the effect of increased or decreased surface area on friction. • Describe the effect of rough and smooth surface on friction. • Describe the effect of increased or reduced weight on friction.
3.3 Air Resistance Air resistance describes the forces that are in opposition to the relative motion of an object as it passes through the air. Eventually, the force of air resistance becomes large enough to balances the force of gravity.	• Define air resistance. • State the importance of air resistance. • Give reasons for the following scenarios; ➢ Why cyclists wear skin suits, helmets and bend down low during racing. ➢ Why cars have converging bonnets. ➢ Why a rain drop comes to the earth in the shape of a tear drop. • Investigate the effect of surface area on air resistance through a parachute. • Describe the effect of increased or decreased surface area on air resistance. • State the ways to reduce air resistance.
3.4 Water Resistance Water resistance describes the force that is in opposition to the relative motion of an object as it passes through the air.	• Define water resistance. • Give reasons for the following scenarios; ➢ Why fish have a streamlined shape. ➢ Why swimmers wear swim suits. ➢ Why a marble ball doesn't spin in a bowl containing water. • Investigate the effect of different shapes on water resistance. • State some ways to reduce water resistance.
Key words: frictional force, motion/movement, wear and tear, surface area, tread patterns, lubricants, opposes, spring balance, air resistance, water resistance, streamlined shape, swim suits, skin suits, torpedo. **Types of Questions:** • Multiple Choice Questions. • Structural Questions. • Short Reasoning Questions. • Descriptive Questions.	

Workbook Activities/Experiments:

- Activity 3.2 (Which lubricant is most effective?)
- Activity 3.3 (Does the type of surface affects friction?)
- Activity 3.4 (Does weight affect friction?)
- Activity 3.5 (How does surface area affect air resistance)

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https://www.youtube.com/watch?v=Ek8fWzmWxgk
https://www.youtube.com/watch?v=vZYwsAvHgVw
https://www.youtube.com/watch?v=xEtYq0G4erA

March

Chapter 4: Keeping Warm **Pages 87-114**

Contents	Learning Outcomes

4.1 Temperature
The degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch. Thermometer is the instrument used to measure temperature. There are different types of thermometer.
• Kitchen thermometer
• Digital clinical thermometer
• Clinical thermometer
• Room thermometer
• Ear thermometer
• Laboratory thermometer
  ➢ Mercuric
  ➢ Alcoholic
	• Define temperature.
	• Describe the gain and loss of heat with respect to change of temperature.
	• Define thermometer.
	• Label and identify the different parts of a thermometer.
	• State the units that are internationally recognized to measure temperature.
	• Measure the temperature of different objects.
	• List the different types of thermometers and describe their uses.
	• State the boiling and melting point of water.
	• Describe the two types of laboratory thermometers.
	• Note down the reading of thermometer.
	• Explain the rise and fall of a liquid that is present in a thermometer.

4.2 Heat Heat is a form of energy created by the movement of atoms and molecules in any material. The higher the temperature of a material, the faster the atoms are moving, and hence the greater the amount of energy present as heat. There are two sources of heat; • Natural • Man-made/Artificial	• Define heat. • Construct a flow chart showing the different types of sources of heat. • Name some natural and man-made heat sources. • Categorize natural and man-made heat sources.
4.3 How does temperature affect human beings and animals? The body temperature of a healthy person varies during the day by about 0.5°C (0.9°F) with lower temperatures in the morning and higher temperatures in the late afternoon and evening, as the body's needs and activities change. Other circumstances also affect the body's temperature.	• State the internal temperature of a healthy human body. • Explain how human body adjusts itself to survive during the seasonal changes. • Identify and categorize the materials used in winter and summer. • Give the reasons for the following scenarios; ➢ Why birds fluff up their feathers

	during winter. ➢ Why birds migrate during winter. ➢ Why marmots hibernate. ➢ How lizards manage to survive during summers. • Explain how hibernation is helpful for animals.
4.4 Heat Conductors and Insulators Heat travels quickly through thermal conductors, like metals. Thermal insulators, like plastic and wood, do not let heat travel through them easily.	• Differentiate between conductors and insulators. • Give examples of conductors and insulators. • Identify the materials through which heat can and cannot pass.

Key words:
data logger, lava, volcano, scarce, dry ice, breathing rate, heart rate, hibernation, hot springs, geysers, fragile, mercury, alcohol, temperature, sensor, poisonous, polystyrene, bubble wrap, aluminum, insulators, conductors.

Types of Questions:
- Multiple Choice Questions.
- Structural Questions.
- Short Reasoning Questions.
- Descriptive Questions.

Workbook Activities/Experiments:
- Activity 4.2 (Measuring temperatures)
- Activity 4.3 (Heat gain , Heat loss)
- Activity 4.4 (Heat flows)
- Activity 4.8 (Heat conductors and Insulators)

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https://www.youtube.com/watch?v=W5teyd8srp8
https://www.youtube.com/watch?v=7VG945bbPbQ
https://www.youtube.com/watch?v=1L7EI0vKVuU
https://www.youtube.com/watch?v=1EvsTKh8m8Q
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April
Revision for Final Examinations

May
Final Examinations