Scheme of Work
NAS 7

UNIT	Objectives	Suggested Activities	Resources	Homework
Unit 1	Explain the root and shoot system in plants. To enable students to comprehend plant system comprising of root system, shoot system, stem, and leaves.	**Starter Activity (10 min)** Bring a potted plant to the class and ask students to name different parts of plants, choose randomly. They should come up and answer with words like shoot, stem, leaves, etc.	Textbook (NAS Book 7) and worksheet A seasonal potted plant Transverse section of stem specimen and Microscope related slides Charts (Plant's external and internal structure, section of stem)	• Ask students to draw a diagram of a young plant and label it. • Read and revise topics for revision and comprehension.
	To enable students to have clear concepts of the process of photosynthesis and adaptations of the leaves for the same	**Starter Activity (10 min)** Bring a potted plant to the class and ask students to observe the object and think about various systems running in it. As they come up with words like living things and that living things need foods, conduct a brainstorming session amongst the students about it and record their ideas and information on board	Textbook (NAS BOOK 7). Charts page 6 Potted plant	Assign reading and marking important points as homework.

	To enable students to understand the process of transpiration and how a potometer is used to measure it. To give a clear concept of transpiration stream. To learn about the importance of minerals, absorption from soil in plant growth.	**Starter Activity (10 min)** In the previous class or prior, take two potted plants place one in the class window and the other in a cupboard. During the class brief them about what was done to plants and have plants displayed and ask the students to compare how they look different. Write a few responses on the board.	Textbook (NAS BOOK 7) Charts (Transpiration Stream, Potometer) Potometer	Ask students to describe the factors affecting transpiration in the form of a note in their notebooks. Read the topic again for revision and consolidation of knowledge.
Unit 2	To identify the certain processes taking place in our bodies. To explain in detail respiration and breathing to enable students to understand what they are and as to how they are different. To give the concept of respiration with and without oxygen in nature To give awareness of respiratory diseases and their prevention and treatment	**Starter Activity (5 min)** A toy car can be shown to the students, and they would be asked how it works ideal responses such as batteries and self should be written on the board then they will be asked how do automobiles work? Ideal responses such as petrol or diesel should be written on the board. Then they will be questioned why do they need it to work? Responses such as batteries are source of energy, and diesel burn to provide energy	• Textbook (NAS Book 7) • Chart page 18 (comparing respiration and breathing) • Model/ Pana flex/ Drawing: Internal structure of human body (Respiratory system) • Textbook (NAS Book 7) • Flash cards (4 sets) 9 cards	Students will read the lesson for better comprehension. The teacher will also share relevant animated video link relevant for the Grade level showcasing the concepts learned. Suggested with video links: https://youtu.be/mOKmjYwfDGU https://youtu.be/X2YVt16Kxak Assign students to read the lesson for better comprehension.

		should be written on the board then the teacher will write the terms respiration and breathing on the board and relate how food in our body breaks down (burns) to release energy and relate breathing as an assisting process for respiration. **Starter Activity (5 min)** Divide the class into 4 groups and give each group a set of flash cards. Ask them to arrange it in order and the first group to do so, should be clapped for.		
Unit 3	To give clear concept of transport system in human body To explain with diagrams the heart and various types of blood vessels	**Starter Activity (5 min)** Write Circulatory system on the board. Teacher will provide the word search worksheet (given below) and ask students to do the word search for the terms. 	• Textbook (NAS 7) • Worksheet	• Ask students to read the topic at home for revision. • Ask students to draw a diagram of human heart and label it.

	To explain in detail the topics under discussion To highlight importance of healthy habits like habits	**Starter Activity (10 min)** How to check pulse rate: Write the title on the board and read step by step method for taking pulse rate	• Textbook (NAS Book 7) • Charts: 1. Double circulation in mammals 2. Step by step method for checking pulse rate	• Students will read the topic at home for better comprehension. • They will be asked to share the information on pulse rate with a family member or friend. Ideally, they may also take their pulse rate.
Unit 4	To enable students to understand the main concept of the lesson To give awareness of common but fatal diseases in detail.	**Starter Activity (10 min)** Students will be introduced to vocabulary and their prior knowledge will be assessed. At the start words and their definition will be written on the board. The definitions will be covered. Teacher and students will talk about the terms and meanings. One by one the definitions will be uncovered. Following is the list: • Disease is a disorder or incorrectly functioning organ, part, structure, or system of the body. Disease can result from genetic	• Textbook (NAS Book 7) • Charts • Videos	• Ask students to read the topic for better understanding.

		or developmental errors, infections, poisons, nutritional deficiency or imbalance or toxicity, or unfavourable environmental factors, an abnormal condition. • Germ is a microorganism that causes diseases. • Infect means affect, contaminate, or taint. • Infection means tending to spread from one to another. • Organism is a living being, a form of life, considered an entity. • Symptoms are a sign or indication of something. • Transmit is to send, spread and pass on. • Transmission is the act or process of spreading.		
	To explain the various lines of defense that the body has against the pathogens. To describe the parts of	**Starter Activity (5 min)** Teacher will ask some questions related to covid-19 as studied earlier.	• Textbook (NAS Book 7) • Charts	Ask students to attempt Quick Review on page# 45 and then Unit Review.

	To describe the parts of the immunity system and how they function to produce an immune response. To describe the three types of immunity in humans, innate, adaptive and passive. To illustrate how adaptive immunity develops overtime. To visualize the ways to add additional layers of defense (such as wearing masks, using sanitizers, etc.) To prepare some common strategies for strength using their immune system. To suggest ways in which communities of people can safeguard against the spread of infectious diseases. To describe the role of vaccines in immunity and explore some strategies on how vaccines can be created give clear concept of the topic To give awareness to students as to how they can lead a healthy life.	Questions such as what happened a few years ago that changed the whole world dynamics such as the closure of schools and everyone was asked to stay at home. This will engage students, then introduce the topic and write key words on the board.	Videos on immunity (resources from Internet) for example : https://youtu.be/azE3rv5l28Y	Ask students to attempt Quick Review on page# 45 and then Unit Review.

Unit 5	Describe and draw the structure of an atom in terms of electrons, protons and neutrons. Describe how an atom is electrically neutral. Differentiate between atomic number and mass number. Determine the atomic number and mass number of elements on the basis of the number of protons, neutrons and electrons. Show the arrangement of K, L, and M shells of elements. Draw the atomic structure of the first eighteen elements of the Periodic table. Explain that the Periodic table is a way to organize elements in a systemic order. Recognise periods and groups in the Periodic table.	**Starter Activity (5 min)** Ask students to rearrange anagrams written on the board. Omta Tronsneu Tonpsro Rontclees Clesparit **Starter Activity (10 min)** • Give each student a piece of card labelled with an element from group 1-7. • Ask students to look at the Periodic table to find their location and arrange themselves in the correct order. • Let the students settle in the correct places. • Ask each student to present the properties of the element they have the card of.	• Textbook (NAS Book 7) • Charts • Models of atoms	• Ask students to study the topic for revision. • Ask the students to draw and label a diagram to show an atom in their notebooks. • Ask students to study the topic for revision. • Learn about the first 18 elements. • Ask students to draw/ paste Periodic table in their notebooks.

Unit 6	Relate uses of materials to their physical properties (e.g., melting point, boiling point, solubility and thermal conductivity). Distinguish between physical and chemical changes. Differentiate between physical and chemical changes while considering daily life examples. Recognise that oxygen is needed in combustion, rusting and tarnishing. Explore methods of preventing rusting. Relate use of materials to their chemical properties(e.g., tendency to rust, flammability) Evaluate impact of combustion reaction on environment.	**Starter Activity (5 min)** • Bring ice cube tray on display table and ask students to observe the change. Ice will quickly melt. • Ask students what they observed. • Write physical change on the board. **Starter Activity (5 min)** Bring a bottle of fizzy drink and ask students to observe. Open the cane or bottle of fizzy drink. Bubbles of Carbon dioxide will be released. Ask students about the change. A chemical change took place as the gas was formed and released. Write chemical change on the board.	• Textbook (NAS Book 7) • Charts • Ice cube tray • Textbook (NAS Book 7) • Charts • Soft drinks-Fizzy carbonated drinks	• Ask students to study the topic for revision. • Ask students to make a list of 5 physical changes that they commonly observe in their daily lives. Ask students to study the topic for revision.

Unit 7	Define valency and explain the formation of ions. Write chemical formulae on the basis of valency of the constituent elements, such as water, Sodium Chloride, Ammonia, Carbon dioxide, etc. Recognise that a chemical bond results from the attraction between atoms in a compound and that the atoms' electrons are involved in the bonding. Discuss formation of a ionic bonds as a result of electrostatic forces between atoms (e.g., Hydrogen, Oxygen and Nitrogen.) Name certain ionic and covalent compounds.	**Starter Activity (5 min)** Place charts of atomic structure on the board. Ask students some questions to recall previous learning of atoms. What are elements? What is the basic building block of an atom? Do atoms exist singly in nature or not? The chemical change takes place at what level? Then put up a chart showing Hydrogen, Sodium, Chlorine, Oxygen and Carbon on board. Share that all the atoms exist in nature as molecules depending on their valency. Write Valency on the board. **Starter Activity (10 min)** Arrange a show a video on the topic(Link provided in resources)	• Textbook (NAS Book 7) • Charts • Models of Molecule Textbook (NAS Book 7) • Charts • Models of atoms and molecules • Video on the topic https://youtu.be/zvBeAaRGo3U (	• Ask students to study the topic for revision. • Ask students to find out valency of water, Carbon, Sodium and write down in their notebooks Ask students to study the topic for revision. Ask students to randomly select some elements from Periodic Table and practice drawing their dot and cross diagrams.

Unit 8	Demonstrate the process of solution formation(using water as a universal solvent). Distinguish among solute, solvent, solution, saturated and unsaturated solutions. Explain what is meant by a concentrated and dilute solution. Define solubility Recognise that the amount of solute that dissolves in a given solvent has an upper limit at a given temperature. Identify the factors which affect the solubility of a solute in a solvent and recognise the importance of these factors in home and industries. Explore the effectiveness of various cleaning solutions in cleaning of tarnished and oxidized coins.	**Starter Activity (5 min)** • Place the material on the display table, in the science laboratory. • Add salt in water and stir. Keep on adding salt till it starts to settle down and is not dissolving further. Heat the solution and stir. The salt will get dissolved. • Ask students to note their observation **Starter Activity (5 min)** Write some of the key words on the board. Solution, solute, solvent, mixture, concentration Ask students to describe in their own words.	• Textbook (NAS Book 7) • Charts • Material for solution preparation(i.e., salt, water, beaker, glass rod) Textbook (NAS Book 7) Charts	Ask students to study the topic for revision

Unit 9	Describe the effect of force on changing the speed and direction of motion with time. Formulate the relationship between speed, distance and time. State SI(System International) unit of speed. Calculate average speed. Interpret a distance time graph. Define and state SI unit of forces. Give examples of contact forces and non-contact forces	**Starter Activity (5 min)** The teacher will begin by asking some questions related to speed and motion. For example: • How can you tell that one car is covering more distance than other? • While bicycling, how do you cover more distance? • When you have to reach another city urgently, what mode of transport would you prefer? • Write the topic on the board. **Starter Activity (5 min)** • Ask students to give definitions of the following: Speed, instantaneous speed, Unit for speed. Then share what can change speed • Write the word Force on the board and brainstorm the ideas that come in their mind. Note those ideas on the board.	• Textbook (NAS Book 7) • Charts	

Unit 10	Define a wave. Compare the type of waves(mechanical and electromagnetic) with daily life examples. Distinguish between Longitudinal and Transverse waves. Identify(i) water waves and sound waves as mechanical waves;(ii) Light waves as electromagnetic waves. Define and relate: 1. Pitch and frequency 2. Amplitude and frequency Explain the factors affecting pitch and sound. Compare and interpret waves forms in terms of pitch and loudness. Construct the inverse relations between time period and frequency. Relate common phenomenon (e.g., echo, hearing thunder after seeing lightning to the properties of sound.)	**Starter Activity (5 min)** Ask students random questions like: • When you go to the beach, what do you see and hear? • What do you call them? So, sound energy is the same. You cannot see it but it has similar waves. Write 'Waves and Energy' on the board. **Starter Activity (5 min)** Arrange a video of natural phenomenon. Link: https://youtu.be/tKVadXBIyLA	• Textbook (NAS Book 7) • Charts • Textbook (NAS Book 7) • Charts • A video on sound energy	

Unit 11	Describe the expansion of three states of matter on heating and contraction. Predict the effect of heat gain and heat loss. Define the terms heat and temperature on the basis of Kinetic theory. Explain why metals are good thermal conductors and fluids are poor conductors of heat using the particle model. Construct the concept of heat conduction, convection and radiation by applying particle theory including daily life examples. Identify the effects of thermal expansion and contraction with their application in daily life. State and explain the practical methods of thermal insulation used for constructing buildings.	**Starter Activity (5 min)** Arrange a practical activity. • Take two beakers, put ice cubes in A and liquid water in B • Place on display table and let the ice melt. • Put beaker B on the burner and let the water evaporate. • Ask students to share their observations randomly. • Write, 'Change of state of matter on the board'. **Starter Activity (5 min)** Start the lesson by taking students on a walk in the school areas showing construction with room for expansion and contraction. Ask students to observe	• Textbook (NAS Book 7) • Charts • Material for lab activity (beakers, thermometer, ice cubes, water, Bunsen burner) • Textbook-NAS 7 • Charts • School paths and other areas showing measures for expansion and contraction.	• Ask students to study the topic for revision. • Ask students to look at the clinical thermometer to study the scales marked on it. • Ask students to read the topic for revision.

Unit 12	Recognise that the force of gravity keeps planets and moons in their orbits. Differentiate between mass and weight using examples of weightlessness experienced by astronauts on the surface of the moon. Recognise that the tides are caused by gravitational pull of the moon. Describe the effects of the Earth's annual revolution around the Sun, given the tilt of its axis(e.g., different seasons, different constellations, visible at different times of the year). Describe how seasons in Earth's Hemisphere are related to Earth's annual movement.	**Starter Activity (5 min)** • Place a poster of solar system on the board(cover labels). • Call students to the board and ask them to identify any one of the celestial bodies. Remove the cover if correct. • At the completion of the activity, write Earth and Space on the board. **Starter Activity (5 min)** Arrange an activity for demonstration of galaxies. Choose any two galaxies (e.g., scorpion, big dipper)and take students(volunteers) and give them playcards. Ask students to come and show pattern of one galaxy then next.	• Textbook-NAS 7 • Charts	

Unit 13	Design a model to demonstrate drip and sprinkler irrigation system for conservation of water. Use different techniques of preserving food like orange juice, jams and pickles. Make a simple stethoscope. Make a sanitizer using suitable substances	**Starter Activity (5 min)** Teacher will ask students some questions; • What do we use to keep our hands germ free? • Would you like to make sanitizer at home? • Share that you will be making several objects through hands on Teacher Ideas 145 activities in school and home. • Write the projects on board	• Textbook NAS 7 • Posters of various activities • Materials for the hands-on activities as given in the book. (For class/lab	• Ask students to study the following topics. • Use the following techniques at home: 1. Techniques to preserve food. 2, Making a sanitizer at home. 3. How to preserve pickles. 4. Technology in health—Making a stethoscope.