

FIRST TERM

WEEKLY LESSON NOTES

WEEK I

Week Ending: 06-10-2023		DAY:		Subject: Science	
Duration: 100mins				Strand: Diversity Of Matter	
Class: B9		Class Size:		Sub Strand: Materials	
Content Standard: B9.1.1.1 Show an understanding of formation of binary chemical compounds and their uses (Acids, Bases and Salts)			Indicator: B9.1.1.1.1 Identify by name binary chemical compounds and discuss their uses.		Lesson: 1 of 2
Performance Indicator: Learners can identify by name binary chemical compounds and discuss their uses				Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 87					
Key words: Compound, Element, Chemical symbol, Binary compound					
Phase/Duration		Learners Activities			Resources
PHASE 1: STARTER		Provide a hint or riddle for one of the compounds you will discuss today, and have learners guess what it is. Example: “I season my food with this white powder, but it's not sugar. What am I?” Answer: Table Salt Share learning indicators and introduce the lesson.			
PHASE 2: NEW LEARNING		Divide the learners into small groups. Provide each group with samples or images of the various materials. Ask learners to discuss and identify each material based on their prior knowledge. Once identified, provide the actual names of the compounds in each material: • Table salt: Sodium Chloride (NaCl) • Water: Dihydrogen Monoxide (H₂O) • Vinegar: Acetic Acid (C₂H₄O₂) Note: not binary but can be used for contrast • Fuel (example: gasoline): various hydrocarbons Note: complex mixture • Soap: Sodium or Potassium salts of fatty acids Note: varies by soap • Detergents: varies by detergent (Sodium dodecylbenzenesulfonate can be an example) • Marble: Calcium Carbonate (CaCO₃) • Fertilizers: varies (Ammonium nitrate NH₄NO₃ can be an example) Discuss the common uses of each material in our daily life.			Pictures and charts

	Now that learners know the names of the compounds, ask them to list the elements found in each. Example: Sodium Chloride (NaCl) contains Sodium (Na) and Chlorine (Cl). Have them write the chemical symbols next to each element's name. <u>Assessment:</u> 1. What is a compound? 2. What is the chemical symbol for Sodium? 3. Name a binary compound commonly found at home and list its elements. 4. Why is vinegar not considered a binary compound?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 06-10-2023		DAY:	Subject: Science
Duration: 100mins		Strand: Diversity Of Matter	
Class: B9	Class Size:		Sub Strand: Materials
Content Standard: B9.1.1.1 Show an understanding of formation of binary chemical compounds and their uses (Acids, Bases and Salts)		Indicator: B9.1.1.1.2 Discuss the formation of binary chemical compounds	Lesson: 2 of 2
Performance Indicator: Learners can discuss the formation of binary chemical compounds			Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:
References: Science Curriculum Pg. 87			
New words: Element, Molecule, Ion, Compound			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Place a water molecule, salt crystal, a piece of iron, and a battery on different corners of a table. Ask: "What do these items have in common, and how might they be different on a microscopic level?" This will set the context for the lesson. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Using visuals, define each term: element, molecule, ion, and compound. Have learners categorize a list of items (like H₂O, NaCl, Fe, Ca²⁺) under the correct headings: element, molecule, ion, or compound. Review and clarify misconceptions Explain what binary compounds are, focusing on their formation. Teach learners how to write the molecular formula of binary compounds. Write the formulas for compounds such as water, carbon (IV) oxide, iron (II) sulphide, and magnesium oxide. Using a Venn diagram or a chart, have learners compare and contrast the properties of different binary chemical compounds based on their composition. Consider properties like solubility, conductivity, melting point, etc. Engage in a discussion about why certain compounds share properties and why some are vastly different. Provide learners with modeling kits or craft materials like colored balls (for atoms) and sticks (for bonds). <u>Assessment</u> 1. What is the primary difference between an element and a compound? 2. If a substance is made up of two types of atoms bonded together, is it a molecule or a compound? Justify your answer. 3. Write the molecular formula for iron (II) sulphide.		Pictures and charts

	4. Based on your models, how do the bonds in water differ from those in carbon (IV) oxide?	
PHASE 3: REFLECTION	Summarize the lesson by reiterating the importance of understanding the fundamental building blocks of matter. Emphasize the fascinating world of compounds and how even the tiniest differences can lead to vastly different properties. Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

FIRST TERM

WEEKLY LESSON NOTES

WEEK 2

Week Ending: 13-10-2023		DAY:		Subject: Science	
Duration: 100mins				Strand: Diversity Of Matter	
Class: B9		Class Size:		Sub Strand: Materials	
Content Standard: B9.1.1.1 Show an understanding of formation of binary chemical compounds and their uses (Acids, Bases and Salts)			Indicator: B9.1.1.1.3 Describe the characteristics of common acids, bases and salts.		Lesson: 1 of 2
Performance Indicator: Learners can describe the characteristics of common acids, bases and salts				Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 88					
New words: Acid, Base (or Alkali), Salt, pH Scale, Indicator					
Phase/Duration	Learners Activities				Resources
PHASE 1: STARTER	Display three unlabeled containers: one with vinegar, one with baking soda, and one with table salt. Ask students: “Can you guess which one is an acid, which one is a base, and which one is a salt?” Share learning indicators and introduce the lesson.				
PHASE 2: NEW LEARNING	Divide students into small groups. Provide each group with a set of labeled samples (but not clearly marked as acid, base, or salt). Examples: lemon juice, soap solution, table salt. Equip each group with indicators like litmus paper. Ask each group to test each sample and classify them as an acid, base, or salt based on their observations and knowledge. Discuss the results as a class. Brainstorm learners to explain what acids, bases and salts are and give examples. <i>Acids are substances that can donate a proton (H^+) to another substance and usually have a pH less than 7. They taste sour, can turn blue litmus paper red, and react with bases to form water and a salt. Examples: Hydrochloric acid (HCl), sulfuric acid (H_2SO_4), citric acid (found in citrus fruits), and acetic acid (found in vinegar).</i> <i>Bases are substances that can accept a proton (H^+) and usually have a pH greater than 7. They feel slippery to the touch, can turn red litmus paper blue, and react with acids to form water and a salt. Alkalies are bases that are soluble in water.</i>				vinegar, baking soda, table salt

	<i>Examples: Sodium hydroxide (NaOH), potassium hydroxide (KOH), and magnesium hydroxide (Mg(OH)₂).</i> Salts are ionic compounds formed by the neutralization reaction between an acid and a base. They are made up of cations (from the base) and anions (from the acid) and can conduct electricity in molten or dissolved states. <i>Examples: Sodium chloride (NaCl), potassium nitrate (KNO₃), and magnesium sulfate (MgSO₄).</i> Provide each group with colored pH scale templates, markers, and a set of common substances (like orange juice, cleaning products, water, etc.). Ask them to use indicators (litmus paper or universal indicator solution) to test each substance and place them on their pH scale according to the results. Encourage groups to display and explain their pH scale models to the class. <u>Assessment</u> 1. What is the difference between an acid and a base in terms of pH value? 2. If a substance has a pH value of 7, how would you classify it? 3. Name a common indicator that can be used to test the nature of a substance. How does it show the difference between acids and bases? 4. If you have a solution that turns blue litmus paper red, how would you classify it?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 13-10-2023		DAY:	Subject: Science
Duration: 100mins			Strand: Diversity Of Matter
Class: B9	Class Size:		Sub Strand: Materials
Content Standard: B9.1.1.2 Demonstrate knowledge of atomic bonding in the formation of chemical compounds		Indicator: B9.1.1.2.1 Recognize that chemical bond results from the attraction between atoms in a compound	Lesson: 2 of 2
Performance Indicator: Learners can describe the attraction between atoms in a compound			Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:
References: Science Curriculum Pg. 88			
New words: Chemical bond, Atom, Ionic bond, Covalent bond, Metallic bond			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Show students a magnet and some iron filings. Ask them: "What makes these iron filings stick to the magnet?" After some discussion, segue into the concept of attraction between atoms, just as there's an attraction between the magnet and iron filings.. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Display diagrams and models illustrating ionic, covalent, and metallic bonds. Discuss the main characteristics of each bond type. Engage students in a matching activity where they match the bond type to its description. Using atomic structure diagrams, demonstrate how bonds form. For example, show how an atom donating an electron (like sodium) and an atom accepting an electron (like chlorine) form an ionic bond. Let students use physical bond models or kits to simulate bond formations, encouraging them to explain their understanding as they do so. Display samples or pictures of various substances. Ask students to identify the type of bonding in each substance based on their learning. Discuss the properties of each substance that make its bonding type evident (e.g., the conductivity of metals due to metallic bonding). <u>Assessment</u> 1. What is the main difference between ionic and covalent bonds in terms of electron transfer or sharing? 2. Which type of bond involves the 'sea of electrons' concept? 3. Why do you think metals are generally good conductors of electricity?		Diagrams showing atomic structures of different elements Pictures and charts

	4. Name a common substance for each type of bond: ionic, covalent, and metallic.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

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WEEKLY LESSON NOTES

WEEK 3

Week Ending: 20-10-2023		DAY:		Subject: Science	
Duration: 100mins				Strand: Diversity Of Matter	
Class: B9		Class Size:		Sub Strand: Living Cells	
Content Standard: B9.1.2.1 Demonstrate knowledge of specialist cells of dicotyledonous plants and humans, their formation and functions for the existence of the plants and humans		Indicator: B9.1.2.1.1 Discuss the concepts of specialized cells and how they are formed in dicotyledonous plants and humans			Lesson: 1 of 2
Performance Indicator: Learners can discuss the concepts of specialized cells and how they are formed in dicotyledonous plants and humans				Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 90					
New words: Specialized Cells, Dicotyledonous, Differentiation, Tissues					
Phase/Duration	Learners Activities				Resources
PHASE 1: STARTER	Display a picture of a professional sports team. Ask learners why each player has a specific role or position. Draw an analogy between specialized team players and specialized cells in organisms. Share learning indicators and introduce the lesson.				
PHASE 2: NEW LEARNING	Divide learners into small groups and ask them to brainstorm on what they think “specialized cells” might mean. Each group can share their definitions. Note the recurring ideas on the board to arrive at a class definition. Explain that dicotyledonous plants are a type of plant that starts with two leaves when they sprout. Discuss how these plants grow, their cells become specialized to perform certain functions. Examples include guard cells in the stomata for gas exchange, xylem cells for water transport, and phloem cells for sugar transport. Introduce the concept that humans start as a single cell, which divides and eventually differentiates into all the various cell types in our body. Give examples of human specialized cells such as red blood cells (for oxygen transport), nerve cells (for transmitting signals), and muscle cells (for movement).				Pictures and Charts

	Hand out clay or play dough to the learners. Ask them to shape the clay into a model of a cell. <u>Assessment</u> 1. What are specialized cells? 2. Name one specialized cell in dicotyledonous plants and its function. 3. Name one specialized cell in humans and its function. 4. Why is cell differentiation important in multicellular organisms?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 20-10-2023		DAY:		Subject: Science	
Duration: 100mins				Strand: Diversity Of Matter	
Class: B9		Class Size:		Sub Strand: Living Cells	
Content Standard: B9.1.2.1 Demonstrate knowledge of specialist cells of dicotyledonous plants and humans, their formation and functions for the existence of the plants and humans		Indicator: B9.1.2.1.2 Examine the functions of specialized cells in dicotyledonous plants such as epidermal, guard cells, cambium, xylem in relation to the existence of the plants.			Lesson: 1 of 2
Performance Indicator: Learners can identify the functions of specialized cells in dicotyledonous plants, such as epidermal cells, guard cells, cambium, and xylem.				Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:	
References: Science Curriculum Pg. 90					
New words: Epidermal Cells, Guard Cells, Cambium, Xylem					
Phase/Duration	Learners Activities				Resources
PHASE 1: STARTER	Display a picture of a big machine or factory, composed of many parts, each with its specific function. Ask learners to think about what would happen if one part stops working. Use this analogy to introduce the idea that plants, like machines, have specialized parts (cells) that ensure the plant functions effectively. Share learning indicators and introduce the lesson.				
PHASE 2: NEW LEARNING	Play a short video clip that gives a close-up view of dicotyledonous plant cells, particularly focusing on epidermal cells, guard cells, cambium, and xylem. Have a discussion on the appearance of each cell type, ensuring that learners can identify each cell by name and appearance. Divide the learners into four groups, assigning each group one of the specialized cell types. Task each group to gather information on the functions of their assigned cell and how it contributes to the overall existence of the plant.				Pictures and Charts
	Cell	Function			
	Epidermal cells	- Protection: The primary function of epidermal cells is to protect the plant from water loss, mechanical injury, and infections. - Regulation: Epidermal cells can also regulate gas exchange and water			

		transpiration through tiny pores called stomata. • Secretion: Some epidermal cells secrete a waxy layer called the cuticle which acts as a water-resistant barrier, further preventing excessive water loss.
	Guard Cells	• Regulation of Stomatal Opening: Guard cells surround each stoma (plural: stomata) on plant leaves and regulate their opening and closing. • Control of Gas Exchange: By adjusting the size of the stomatal pores, guard cells control the exchange of gases (like carbon dioxide and oxygen) between the plant leaves and the environment. • Water Regulation: The opening and closing of stomata also play a critical role in regulating water vapor loss (transpiration) from the plant.
	Cambium	• Cell Production: The cambium is a type of meristem, and its primary function is cell production. It is responsible for producing new cells which can become part of the xylem, phloem, or more cambium. • Support and Growth: As the cambium produces cells, it contributes to the thickness (secondary growth) of stems and roots, strengthening the plant and allowing it to transport more nutrients and water.
	Xylem	• Water and Nutrient Transport: Xylem's primary function is to transport water and dissolved nutrients from the roots to various parts of the plant. • Support: Xylem cells, once matured, become lignified (filled with lignin), which strengthens the cell walls and provides support to the plant. • Storage: Some xylem cells can also be involved in storing nutrients and water.

After research, each group should prepare a short presentation to share with the class.

Facilitate a class discussion on the importance of each cell type in the overall health and survival of dicotyledonous plants.

Assessment

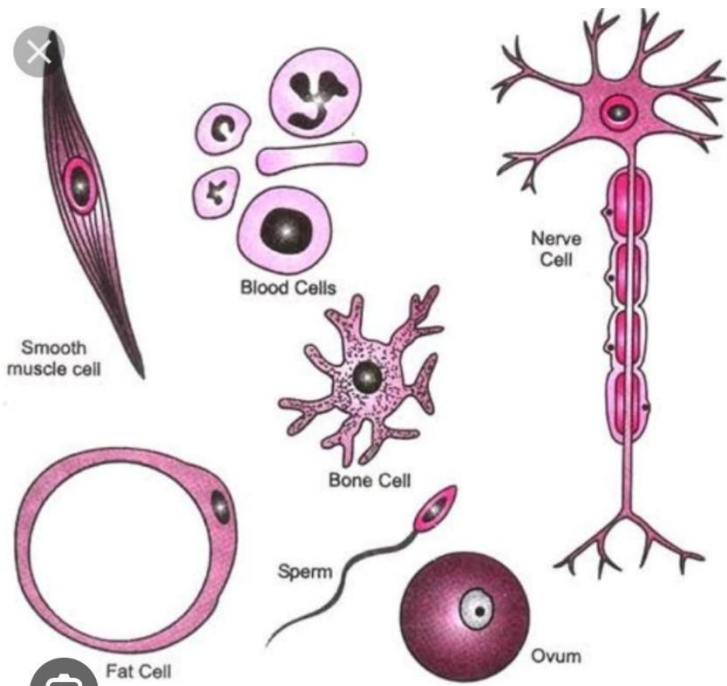
1. What is the main function of guard cells in dicotyledonous plants?
2. Why are epidermal cells important for a plant?

	3. How does the cambium contribute to a plant's growth? 4. Describe the role of xylem in dicotyledonous plants.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

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WEEKLY LESSON NOTES

WEEK 4

Week Ending: 27-10-2023	DAY:	Subject: Science
Duration: 100mins		Strand: Diversity Of Matter
Class: B9	Class Size:	Sub Strand: Living Cells
Content Standard: B9.1.2.1 Demonstrate knowledge of specialist cells of dicotyledonous plants and humans, their formation and functions for the existence of the plants and humans	Indicator: B9.1.2.1.3 Examine the functions of specialized animal cells such as (nerve, blood cells, muscle cells and sperm cells) in relation to the existence of humans	Lesson: 1 of 2
Performance Indicator: Learners can recognize and identify specialized animal cells		Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:
References: Science Curriculum Pg. 91		
New words: Cell, Specialized, Observation, model		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Begin by asking: "What do you think is the smallest unit that makes up our body?" Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Display pictures and charts showcasing nerve cells, blood cells, muscle cells, and sperm cells.  Smooth muscle cell Blood Cells Nerve Cell Bone Cell Sperm Fat Cell Ovum Discuss their unique shapes and functions briefly as each is presented.	

	Provide learners with modeling clay or play dough of various colors. Encourage learners to create 3D models of the specialized cells, mimicking the shapes they observed. As they work, circulate the classroom and engage with them, prompting discussions about the unique features of each cell they're modeling. Ask learners to share their models and explain why they chose certain shapes and features for each cell. <u>Assessment</u> 1. Which cell has long extensions and is involved in transmitting information? 2. Which cell can be round and is responsible for transporting oxygen? 3. What might be the main function of muscle cells? 4. Why do you think sperm cells have a tail?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

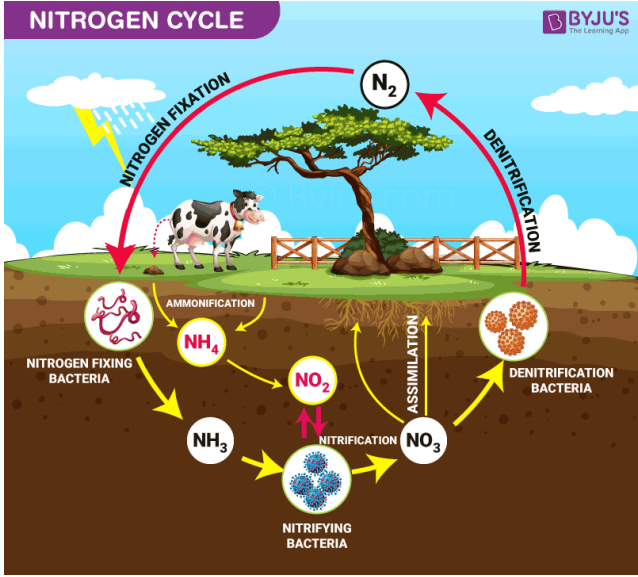
Week Ending: 27-10-2023		DAY:	Subject: Science
Duration: 100mins		Strand: Diversity Of Matter	
Class: B9	Class Size:		Sub Strand: Living Cells
Content Standard: B9.1.2.1 Demonstrate knowledge of specialist cells of dicotyledonous plants and humans, their formation and functions for the existence of the plants and humans		Indicator: B9.1.2.1.3 Examine the functions of specialised animal cells such as (nerve, blood cells, muscle cells and sperm cells) in relation to the existence of humans	Lesson: 2 of 2
Performance Indicator: Learners can discuss the crucial roles specialized animal cells play in the overall existence and functioning of humans			Core Competencies: DL 5.3: CI 6.8: DL 5.1: CI 6.6:
References: Science Curriculum Pg. 91			
New words: Existence, Function, Reaction, Specialized			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Ask: "Can you think of how our body knows when our hand touches something hot?" Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Brainstorm learners to discuss the functions of the specialized cells. • Nerve cells: Transmit signals and help in reactions. • Blood cells: Transport oxygen and nutrients, defend against diseases. • Muscle cells: Help in movement and maintaining posture. • Sperm cells: Play a role in human reproduction. Discuss how the specialized functions of these cells relate to everyday human activities and existence. Example: <i>Scenario: Sarah was baking cookies. As she reached inside the oven to retrieve the baking tray, she accidentally touched the hot metal. Almost immediately, she jerked her hand back.</i> <i>Explanation: Nerve cells, or neurons, in Sarah's hand transmitted a rapid signal to her brain indicating heat and potential harm. The brain then sent a signal back, prompting her muscles to react and pull her hand away. This entire process happened almost instantaneously, thanks to the specialized function of nerve cells that transmit signals efficiently.</i> Ask learners to think of a daily activity (like eating, running, or reading) and identify which specialized cells might be involved and why. <i>Example: After a long run, Tom felt exhausted and sat down to catch his breath. As he rested, he felt his heartbeat normalize and his breath become steady.</i> Learners can share their thoughts in pairs or small groups.		

	Allow a few groups or pairs to share their daily activity and the cells they connected to that activity. <u>Assessment</u> 1. Why is the shape of nerve cells important for their function? 2. How do muscle cells contribute to activities like eating or playing sports? 3. Why are blood cells crucial for our existence? 4. What is the unique function of sperm cells in human reproduction?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

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WEEKLY LESSON NOTES

WEEK 5

Week Ending: 03-11-2023	DAY:	Subject: Science
Duration: 100mins		Strand: Cycles
Class: B9	Class Size:	Sub Strand: Earth science
Content Standard: B9.2.1.1 Demonstrate an understanding of the Nitrogen cycle as a repeated pattern of change in nature, and how it relates to the environment		Indicator: B9.2.1.1.1 Explain the process of the nitrogen cycle as a repeated pattern in nature
		Lesson: 1 of 2
Performance Indicator: Learners can identify and understand the different stages of the nitrogen cycle. Learners can recognize the importance of the nitrogen cycle in the environment. Learners can explain why the nitrogen cycle is a recurring process in nature.		Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation (CI)
References: Science Curriculum Pg. 91		
New words: Nitrogen Cycle, Nitrogen Fixation, Nitrification, Assimilation		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Display a picture of a healthy plant and a withered plant. Ask learners: "What do plants need to grow and stay healthy? What might be lacking in the withered plant?" Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Using pictures, guide learners to Identify the nitrogen cycle.  Learners should identify and make notes on the key components and processes of the cycle. Explain the nitrogen cycle depicting processes such as: 1. Nitrogen Fixation: - Conversion of atmospheric nitrogen (N_2) to ammonia (NH_3) by specific bacteria or through abiotic processes like lightning.	Pictures and charts

	2. Nitrification:- Two-step process where ammonia (NH_3) is converted first to nitrite (NO_2^-) and then to nitrate (NO_3^-) by certain bacteria in the soil. 3. Assimilation:- Uptake and incorporation of nitrogen (often in the form of nitrate or ammonia) by plants to synthesize amino acids, proteins, and other organic molecules. 4. Ammonification (or Mineralization):- Decomposition of organic nitrogenous matter (like dead plants and animals) by decomposers, resulting in the release of ammonia (NH_3) back into the soil. 5. Denitrification:- Conversion of nitrates (NO_3^-) and nitrites (NO_2^-) in the soil back to gaseous nitrogen (N_2) or nitrous oxide (N_2O) by certain bacteria, releasing it into the atmosphere. Use visual aids like charts or diagrams to help learners understand each step. Discuss the role of bacteria and other organisms in these processes. Let learners explain the relationship between the nitrogen cycle and the environment. Example: Soil Fertility: The nitrogen cycle plays a key role in maintaining soil fertility by ensuring a continuous supply of essential nitrogen compounds that plants need for growth. Air Quality: Denitrification releases nitrogen gases back to the atmosphere, maintaining a balance. However, excessive nitrogen can lead to the production of nitrous oxide, a greenhouse gas. Water Quality: Excessive nitrates due to agricultural runoff can contaminate water, leading to problems like eutrophication, which can cause algal blooms and deplete oxygen in water bodies. Discuss how plants rely on the nitrogen present in the soil, and how animals rely on plants (and other animals) for their nitrogen needs. Emphasize the interconnectedness of all life forms and the environment within this cycle. <u>Assessment</u> 1. What is the purpose of nitrogen fixation in the nitrogen cycle? 2. During which process is ammonia converted into nitrates? 3. Why is the nitrogen cycle important for the environment? 4. How does the repeated pattern of the nitrogen cycle ensure balance in nature?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

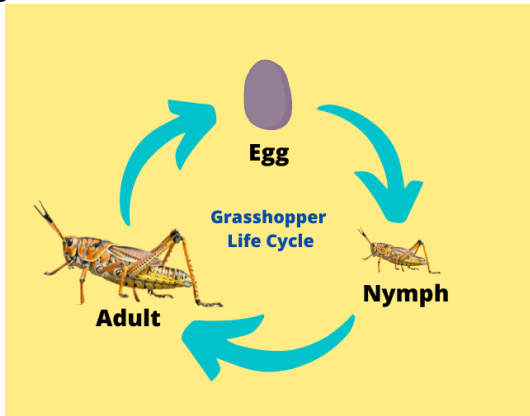
Week Ending: 03-11-2023		DAY:	Subject: Science	
Duration: 100mins			Strand: Cycles	
Class: B9		Class Size:		Sub Strand: Earth science
Content Standard: B9.2.1.1 Demonstrate an understanding of the Nitrogen cycle as a repeated pattern of change in nature, and how it relates to the environment		Indicator: B9.2.1.1.2 Describe the importance of the nitrogen cycle to the environment		Lesson: 2 of 2
Performance Indicator: Learners can understand the significance of nitrogen to the environment and recognize the role of certain plants, such as leguminous crops, in replenishing soil nitrogen.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation (CI)	
References: Science Curriculum Pg. 91				
New words: Nitrogen Cycle, Leguminous Crops, Leaching, Bush Burning				
Phase/Duration	Learners Activities			Resources
PHASE 1: STARTER	Display pictures of thriving crops and barren fields. Ask learners: "Why do you think one field is lush and the other is barren? How might nitrogen play a role?" Share learning indicators and introduce the lesson.			
PHASE 2: NEW LEARNING	1. Describe the importance of nitrogen to the environment. 2. Carry out a project to show how certain plants such as leguminous crops can replenish nitrogen in the soil. 3. Predict what will happen if the nitrogen cycle is interrupted by actions such as leaching, bush burning, and destruction of leguminous plants Engage learners to describe the importance of nitrogen to the environment. Discuss how nitrogen is a critical component of amino acids, proteins, and DNA, which are essential for life. Highlight the fact that the atmosphere is about 78% nitrogen, but plants and animals can't directly use it in its gaseous form. Explain the need for the nitrogen cycle to convert atmospheric nitrogen into a usable form for plants and animals. Carry out a project to show how certain plants such as leguminous crops can replenish nitrogen in the soil. In groups, learners can plant leguminous crops in small pots. In another set of pots, plant non-leguminous crops.			Pictures and charts

	Observe growth over a period, noting differences. Research or discuss the role of nitrogen-fixing bacteria present in the roots of leguminous plants. Conclude by discussing how leguminous crops are beneficial to agriculture and the environment. Predict what will happen if the nitrogen cycle is interrupted by actions such as leaching, bush burning, and destruction of leguminous plants. Introduce each disruption (leaching, bush burning, and destruction of leguminous plants) one by one and ask learners to predict the effects. Guide the discussion toward understanding the fragility of the nitrogen cycle and the consequences of its interruption on soil fertility, crop production, and the broader ecosystem. <u>Assessment</u> 1. Why is nitrogen important for plants and animals? 2. How do leguminous crops aid in replenishing soil nitrogen? 3. What is the consequence of bush burning on the nitrogen cycle? 4. Predict an effect on the environment if leguminous plants are massively destroyed.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

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WEEKLY LESSON NOTES

WEEK 6

Week Ending: 10-11-2023		DAY:	Subject: Science
Duration: 100mins			Strand: Cycles
Class: B9	Class Size:		Sub Strand: Life Cycles of Organisms
Content Standard: B9.2.2.1 Demonstrate an understanding of the life cycle of grasshopper and assess how their activities affect humans		Indicator: B9.2.2.1.1 Describe the life cycle of the grasshopper as a form of incomplete metamorphosis	Lesson: 1 of 2
Performance Indicator: Learners can describe the life cycle of the grasshopper and differentiate between incomplete and complete metamorphosis			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 91			
New words: Incomplete Metamorphosis, Nymph, Life Cycle, Complete Metamorphosis			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Display two images side by side: one of a grasshopper nymph and the other of a caterpillar. Ask learners, "How do these two creatures grow into their adult forms?" This serves to intrigue learners about the different forms of metamorphosis. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Provide learners with paper, pencils, and coloring materials. Guide learners in drawing the life cycle of the grasshopper, from egg to nymph to adult. Emphasize the progression and differences at each stage.  Using the drawn life cycles, initiate a class discussion about the behavior of grasshoppers at each stage, such as the feeding habits of nymphs versus adults.		Pictures and charts

	Encourage learners to share any personal observations or experiences they've had with grasshoppers. Explain the concept of incomplete metamorphosis using the grasshopper as an example. Contrast this with complete metamorphosis, using examples like the housefly and mosquito. Highlight key differences, such as the absence of a pupal stage in incomplete metamorphosis. Facilitate a discussion on why these different life cycles might have evolved and the potential advantages of each. <u>Assessment</u> 1. What are the three main stages of the grasshopper's life cycle? 2. How does the behavior of a grasshopper nymph differ from that of an adult? 3. What stage is missing in the grasshopper's life cycle that makes it "incomplete" metamorphosis? 4. Can you name another insect that undergoes complete metamorphosis?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 03-11-2023		DAY:	Subject: Science
Duration: 100mins		Strand: Cycles	
Class: B9	Class Size:		Sub Strand: Life Cycles of Organisms
Content Standard: B9.2.2.1 Demonstrate an understanding of the life cycle of grasshopper and assess how their activities affect humans		Indicator: B9.2.2.1.2 Examine how the activities of the grasshopper affect humans	Lesson: 2 of 2
Performance Indicator: Learners can describe the various activities of grasshoppers and evaluate their effects (both beneficial and harmful) on humans.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 91			
New words: Grasshopper Activities, Beneficial, Harmful, Impact			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Show a short video clip or images of a swarm of locusts (a type of grasshopper) ravaging crops. Pair this with an image of a single grasshopper in a natural setting. Ask, "How can this small insect have such a massive impact?" Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Discuss the general behaviors and activities of grasshoppers in their natural habitats, emphasizing their diet, such as feeding on grasses and weeds. Highlight the difference between solitary grasshoppers and gregarious locusts to provide a broader context. Divide learners into groups and assign each group either a beneficial or harmful activity of grasshoppers related to humans. Each group conducts a brief research (using books, internet, etc.) to gather more details on their assigned topic. For instance, one group could research how grasshoppers can serve as a food source in certain cultures (beneficial) while another could delve into their role in agricultural destruction (harmful). Based on the research, each group will brainstorm and list down activities or strategies that either promote the beneficial impacts or reduce the harmful effects of grasshoppers on humans. For instance, for the beneficial aspect of grasshoppers as a food source, a group might suggest promoting grasshopper farming. On the harmful side, suggestions could include natural pest control methods to protect crops.		Pictures and charts

	Groups present their findings and suggested activities to the class. Facilitate a class discussion to consolidate learning and share different perspectives. <u>Assessment</u> 1. What are some typical activities of grasshoppers in their natural environment? 2. Name one beneficial impact of grasshoppers on humans. 3. How can grasshoppers be harmful to human activities? 4. Suggest one activity or strategy to mitigate the negative effects of grasshoppers on agriculture.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

FIRST TERM

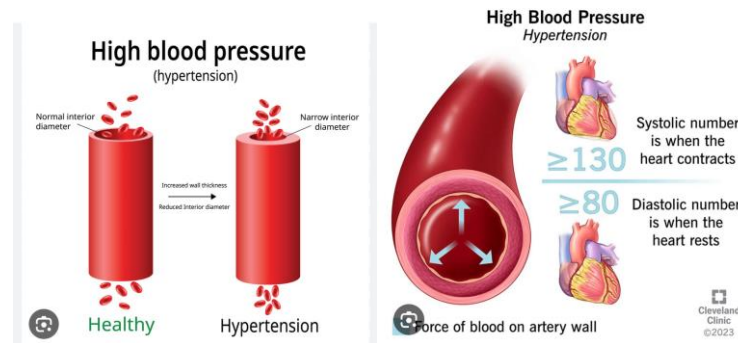
WEEKLY LESSON NOTES

WEEK 7

Week Ending: 17-11-2023	DAY:	Subject: Science
Duration: 100mins		Strand: Systems
Class: B9	Class Size:	Sub Strand: Human Body systems
Content Standard: B9.3.1.1 Demonstrate understanding of the blood circulatory system, health problems associated with the system and its relationship with the respiratory system in humans	Indicator: B9.3.1.1.1 Explain the concept of the circulatory system, state the function of each part of the system and the health challenges associated with it	Lesson: 1 of 2
Performance Indicator: Learners can describe the concept of the circulatory system, recognize the functions of each part, and identify potential health challenges related to the system.		Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 102		
New words: Circulatory System, Blood Composition, Heart, Blood Vessels		
Phase/Duration	Learners Activities	Resources
PHASE 1: STARTER	Begin with a hands-on activity: ask learners to find their pulse (either on their wrist or neck). Once everyone has found their pulse, ask them, "What are you feeling? What makes this pulse happen?" Share learning indicators and introduce the lesson.	
PHASE 2: NEW LEARNING	Introduce the circulatory system, explaining its primary function to transport blood throughout the body. Discuss the composition of blood: red blood cells, white blood cells, platelets, and plasma. Brainstorm learners for the role of each component. Using diagrams to illustrate the main parts of the circulatory system: the heart, blood vessels (arteries, veins, capillaries), and blood. Explain the function of each part: - Heart: pumps blood. - Arteries: carry blood away from the heart. - Veins: carry blood to the heart. - Capillaries: facilitate the exchange of oxygen and nutrients. Divide learners into small groups. Assign each group a part of the circulatory system or a component of blood. Each group creates a short presentation or skit, acting out or illustrating the function of their assigned part and its importance to the overall system.	Pictures and charts

	Briefly introduce common health challenges related to the circulatory system, such as high blood pressure, anemia, and coronary artery disease. Discuss potential causes and the importance of maintaining a healthy circulatory system. <u>Assessment</u> 1. What are the primary components of the circulatory system, and what does each component do? 2. Describe the composition of blood and the function of each component. 3. Why is the heart considered a crucial organ in the circulatory system? 4. Name one health challenge related to the circulatory system and explain its potential cause.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 17-11-2023		DAY:	Subject: Science
Duration: 100mins			Strand: Systems
Class: B9	Class Size:		Sub Strand: Human Body systems
Content Standard: B9.3.1.1 Demonstrate understanding of the blood circulatory system, health problems associated with the system and its relationship with the respiratory system in humans		Indicator: B9.3.1.1.1 Explain the concept of the circulatory system, state the function of each part of the system and the health challenges associated with it	Lesson: 1 of 2
Performance Indicator: Learners can understand the intricacies of the circulatory system, including the detailed structure of the heart, health challenges related to the system, and concepts like blood pressure.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 102			
New words: Mammalian Heart, Blood Pressure, Circulatory Diseases, Prevention			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Show learners a brief video clip or animation of the circulatory system in action, emphasizing the heart pumping blood throughout the body. Pose the question: "What do you think happens when something goes wrong in this system?" Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Distribute diagrams of the heart where learners can reference the structure. Guide learners in drawing and labeling the longitudinal section of a mammalian heart. Ensure they label key parts like the atria, ventricles, valves, and major blood vessels. Initiate a class discussion about diseases related to the circulatory system. Introduce common issues like atherosclerosis, heart attacks, strokes, and aneurysms. Discuss potential causes of these diseases, such as poor diet, lack of exercise, genetics, and smoking. Explain the concept of blood pressure, detailing systolic and diastolic pressures.		Pictures and charts



Discuss the significance of maintaining healthy blood pressure levels and potential problems associated with high or low blood pressure.

Share ways of managing and maintaining healthy blood pressure, such as a balanced diet, regular exercise, and stress management techniques.

Arrange learners into groups and assign each group one of the health challenges or prevention measures discussed.

Ask groups to come up with a short skit, presentation, or poster to explain their topic to the class.

Assessment

1. What are the main chambers of the mammalian heart, and what are their roles?
2. Name one disease of the circulatory system and its primary cause.
3. What is the difference between systolic and diastolic blood pressure?
4. List one way to manage or prevent high blood pressure.

PHASE 3: REFLECTION

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

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WEEKLY LESSON NOTES

WEEK 8

Week Ending: 24-11-2023		DAY:	Subject: Science
Duration: 100mins			Strand: Systems
Class: B9	Class Size:		Sub Strand: Human Body systems
Content Standard: B9.3.1.1 Demonstrate understanding of the blood circulatory system, health problems associated with the system and its relationship with the respiratory system in humans		Indicator: B9.3.1.1.2 Explain the concept of respiration and show how the respiratory and circulatory systems complement each other.	
Performance Indicator: Learners can explain the concept of respiration and demonstrate how the respiratory and circulatory systems complement each other.		Lesson: 1 of 2	
Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation			
References: Science Curriculum Pg. 102			
New words: Respiration, Respiratory system, Circulatory, Glucose			
Phase/Duration	Learners Activities	Resources	
PHASE 1: STARTER	Begin with a thought-provoking question: "Why do you think we breathe, and what do you think happens inside our bodies when we do?" Allow learners to share their ideas. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Explain the concept of respiration Explain how deoxygenated blood from circulation is oxygenated through inhalation for respiration to take place. Define respiration as the process that occurs in our bodies to release energy from glucose and oxygen while producing carbon dioxide and water. Emphasize that this energy is essential for all the body's functions. Explain that the respiratory system, which includes the lungs, is responsible for the exchange of gases. Oxygen is inhaled, and carbon dioxide is exhaled. Discuss the importance of oxygen in the process of respiration. Introduce the circulatory system and its role in transporting oxygen and glucose to cells and removing carbon dioxide.	Pictures and charts	

	Explain how the heart pumps blood throughout the body, ensuring that cells receive the necessary oxygen and nutrients. Provide a visual representation or a simple model to demonstrate how the respiratory and circulatory systems work together. Highlight the exchange of gases in the lungs and the transport of oxygen and nutrients through the blood. <u>Assessment</u> 1. What is respiration, and why is it important for our bodies? 2. How does the respiratory system contribute to the process of respiration? 3. Explain the role of the circulatory system in respiration and the transportation of essential substances. 4. Provide an example of how the respiratory and circulatory systems complement each other to support our daily activities	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 24-11-2023		DAY:	Subject: Science
Duration: 100mins			Strand: Systems
Class: B9	Class Size:		Sub Strand: Human Body systems
Content Standard: B9.3.1.1 Demonstrate understanding of the blood circulatory system, health problems associated with the system and its relationship with the respiratory system in humans		Indicator: B9.3.1.1.2 Explain the concept of respiration and show how the respiratory and circulatory systems complement each other.	Lesson: 1 of 2
Performance Indicator: Learners can explain how deoxygenated blood is oxygenated through inhalation for the process of respiration to take place.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 102			
New words: Respiration, Respiratory system, Circulatory, Oxygenation			
Phase/Duration	Learners Activities	Resources	
PHASE 1: STARTER	Begin with a "Lung Model Exploration" activity. Show a simple model of the lungs and ask learners to observe it. Discuss what they already know about how breathing helps in oxygenating the blood. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Explain the basics of the respiratory system and its role in oxygenating the blood. Present a simple lung model for learners to observe. Engage learners in a discussion about what they already know about how breathing and the lungs work to oxygenate the blood. Use visual aids to depict the process. Provide a detailed explanation of how deoxygenated blood from circulation is oxygenated through inhalation. Use diagrams to illustrate the path of air and exchange of gases in the lungs. Conduct a hands-on demonstration where learners simulate the inhalation and exhalation process to better understand the exchange of gases. <u>Assessment</u> 1. What is the role of the respiratory system in the oxygenation of blood? 2. Can you explain how deoxygenated blood is oxygenated through inhalation?	Pictures and charts	

	3. Describe the path of air in the respiratory system and how it exchanges gases with the blood.	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

FIRST TERM

WEEKLY LESSON NOTES

WEEK 9

Week Ending: 30-11-2023		DAY:	Subject: Science
Duration: 100mins		Strand: Forces & Energy	
Class: B9	Class Size:		Sub Strand: Energy
Content Standard: B9.4.1.1 Show understanding of the concept of conservation of energy and ways of conserving energy		Indicator: B9.4.1.1.1 List the ways to conserve energy. Examples: ironing in bulk, using energy efficient appliances and switching off appliances when not in use.	Lesson: 1 of 3
Performance Indicator: Learners can explore and identify various strategies for conserving energy.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation
References: Science Curriculum Pg. 106			
New words: Energy Conservation, Sustainable Practices, Energy Efficiency,			
Phase/Duration	Learners Activities		Resources
PHASE 1: STARTER	Begin the lesson with a simple question: "What do you think it means to conserve energy?" Allow learners to share their initial thoughts and ideas. Write their responses on the board. Share learning indicators and introduce the lesson.		
PHASE 2: NEW LEARNING	Facilitate a discussion on the importance of conserving energy and its impact on the environment. Introduce key terms such as energy conservation, sustainable practices, and energy efficiency. Ask learners to brainstorm everyday activities that require energy and ways these activities can be done more efficiently. Divide learners into small groups. Provide each group with a list of energy conservation tips. Ask them to discuss and categorize the tips into practical strategies for conserving energy at home, school, or in their community. Have each group present their categorized tips to the class. Challenge learners to identify and list electronic devices that consume energy when turned off. Discuss strategies to reduce phantom energy consumption.		Pictures and charts Interactive activities related to energy conservation

	Have learners come up with additional energy conservation tips and encourage learners to pick one tip to implement in their daily lives. <u>Assessment</u> 1. Explain the concept of energy conservation in your own words. Why is it important in our daily lives? 2. Discuss a specific energy conservation tip that you find practical and explain how you can implement it at home or school. 3. What are sustainable practices, and how do they contribute to energy conservation?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 30-11-2023		DAY:	Subject: Science	
Duration: 100mins			Strand: Forces & Energy	
Class: B9		Class Size:	Sub Strand: Energy	
Content Standard: B9.4.1.1 Show understanding of the concept of conservation of energy and ways of conserving energy		Indicator: B9.4.1.1.2 Explain the importance of energy conservation in daily life.		Lesson: 2 of 3
Performance Indicator: Learners can explore and understand the importance of energy conservation in their daily lives.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation	
References: Science Curriculum Pg. 107				
New words: Energy Conservation, Sustainability, Environmental Impact, Renewable Energy				
Phase/Duration	Learners Activities			Resources
PHASE 1: STARTER	Begin the lesson by asking learners a thought-provoking question: "Why do you think saving energy is important in our daily lives?" Allow learners to share their initial thoughts and experiences. Write their responses on the board to create a visual reference for the discussion. Share learning indicators and introduce the lesson.			
PHASE 2: NEW LEARNING	Discuss the importance of gathering information to understand complex topics like energy conservation. Introduce the main question: "Why is energy conservation important in our daily lives?" Explain that learners will conduct research to find information on this topic. Provide learners with guiding questions on energy conservation, such as: • What are the environmental benefits of energy conservation? • How does energy conservation contribute to sustainability? • In what ways can individuals save energy in their daily activities? Allow learners to use computers or tablets to research and gather information. Form small groups and have learners discuss their findings. Encourage them to share insights, ask questions, and consider different perspectives on the importance of energy conservation.			Pictures and charts

	Facilitate a whole-class discussion where each group shares key points from their research. Summarize the collective understanding of why energy conservation is crucial in daily life. <u>Assessment</u> 1. Based on your research, what are the environmental benefits of energy conservation? 2. How does energy conservation contribute to the concept of sustainability? 3. In what ways can individuals save energy in their daily activities? Provide specific examples. 4. Reflect on your own habits: What changes can you make in your daily life to contribute to energy conservation?	
PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	

Week Ending: 30-11-2023		DAY:	Subject: Science	
Duration: 100mins			Strand: Forces & Energy	
Class: B9		Class Size:	Sub Strand: Energy	
Content Standard: B9.4.1.2 Demonstrate understanding in and the capability to do calculations involving energy.		Indicator: B9.4.1.2.1 Explain how to calculate energy consumed over a period of time		Lesson: 3 of 3
Performance Indicator: Learners can calculate electrical energy consumption using the formula $P = IV$, where P is power, I is current, and V is voltage and apply this knowledge to calculate energy consumption in Kilowatt-hours (kWh) for common electrical appliances.			Core Competencies: Critical Thinking and Problem Solving (CP), Communication and Collaboration (CC) Digital Literacy (DL), Creativity and Innovation	
References: Science Curriculum Pg. 106				
New words: Electrical Energy Consumption:, Power, Voltage (V) and Current (I), Kilowatt-hour (kWh)				
Phase/Duration	Learners Activities			Resources
PHASE 1: STARTER	Begin the lesson with a real-world scenario: "Imagine you have a device that uses electrical energy. How do you think we can measure and calculate the amount of energy it consumes?" Allow learners to share their initial thoughts, and write their responses on the board. Introduce the term "electrical energy consumption" and explain that it's measurable using specific formulas. Share learning indicators and introduce the lesson.			
PHASE 2: NEW LEARNING	Introduce the formula $P = IV$, explaining that it is used to calculate power when voltage (V) and current (I) are known. Discuss the concept of power and its relevance to electrical energy consumption. Provide examples of electrical appliances and their power ratings. Guide learners through the calculation of electrical energy consumption in kilowatt-hours (kWh) using the formula $P = IV$. Distribute a list of typical power ratings for common electrical appliances. In pairs or small groups, have learners calculate the energy consumption (kWh) for each appliance using the formula. Facilitate a discussion where each group shares their findings and discusses any challenges faced during the calculations. Encourage learners to compare the energy consumption of different appliances.			Pictures and charts List of typical power ratings for common electrical appliances

Give learners a set of practice problems or scenarios that involve calculating energy consumption for various appliances.

Encourage learners to apply the formula independently, and circulate the room to provide assistance as needed.

Example:

Calculate the energy consumption (in kWh) for a device with a power rating of 500 watts running for 3 hours

Solution

To calculate the energy consumption (in kilowatt-hours, kWh) for a device with a power rating of 500 watts running for 3 hours, you can use the formula:

$$\text{Energy Consumption (kWh)} = \frac{\text{Power (Watts)} * \text{Time (Hours)}}{1000}$$

Given:

- Power (P) = 500 watts

- Time (t) = 3 hours

Substitute these values into the formula:

$$\text{Energy Consumption (kWh)} = \frac{500 * 3}{1000}$$

$$\text{Energy Consumption (kWh)} = \frac{1500}{1000}$$

$$\text{Energy Consumption (kWh)} = 1.5 \text{ kW}$$

Therefore, the energy consumption for the device is 1.5 kilowatt-hours.

Assessment

1. Calculate the energy consumption (in kWh) for a device with a power rating of 500 watts running for 3 hours.
2. List two factors that contribute to the power consumption of an electrical appliance. How might you reduce the energy consumption of a device?
3. A computer has a power rating of 120 watts. If it runs continuously for 5 hours, what is the energy consumption in kilowatt-hours?
4. An LED light bulb has a power rating of 9 watts. If it is used for 8 hours per day, how much energy does it consume in kilowatt-hours over a week?
5. A microwave oven has a power rating of 800 watts. If it is used for 10 minutes to heat food, what is the energy consumption in kilowatt-hours?

PHASE 3: REFLECTION	Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.	
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