MATATAG K to 10 Curriculum Weekly Lesson Log	School:	Visit DepEdResources.com for More	Grade Level:	4
	Teacher:		Learning Area:	SCIENCE
	Teaching Dates and Time:	AUGUST 12 - 16, 2024 (WEEK 3)	Quarter:	1

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners learn that: 1. Chemical properties of materials determine their uses.
B. Performance Standards	By the end of the Quarter, learners describe chemical properties of materials and changes to them. They demonstrate an understanding that science processes can solve everyday problems and use creativity and determination to provide examples. They exhibit objectivity and open-mindedness in gathering information related to environmental issues and concerns in the community
C. Learning Competencies and Objectives	***Learning Competencies*** 1. *describe the chemical properties of materials, such as they can be burnt, react with other materials, or are degradable or biodegradable;* 2. *Learning objectives:* a. *Identify flammable materials and explain their properties.* b. *Recognize the importance of fire safety precautions and responsible behavior around flammable materials.* c. *Define chemical reactions and their significance in material interactions.* d. *Analyze the factors that influence material reactivity and predict outcomes of common reactions.* e. *Differentiate between degradable and biodegradable materials.* f. *Evaluate the environmental implications of using degradable and biodegradable materials versus non- degradable materials.*
D. Content	Materials and their uses
E. Integration	● Creativity and innovation ● Environmental awareness (Environmental Literacy) ● Collaboration

II. LEARNING RESOURCES
Delos Reyes, R. L. (2022). Science Links. Quezon City: REX Publication.

Campbell, C., & Tytler, R. (2007). Views of student learning. In V. Dawson & G. Venville (Eds.), The Art of Teaching Primary Science (pp. 23- 41). Australia: Griffin Press.

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**DAY 1** **SHORT REVIEW** The students will classify materials at home and in school. **Instructions**: ● Let the students observe the books in the library. ● Let the students observe goods/food products at home. *Guide Questions:* 1. How are books arranged in the library? 2. How are the goods/food products arranged inside your food cabinet or refrigerator? 3. How does it help when things are grouped properly at home?	The teacher may emphasize to the class that in their household and even in school, they will often see different materials like food, canned goods, and books that are arranged properly. There are many ways to arrange these materials for easier classification.
B. Establishing Lesson Purpose	**1. Lesson Purpose** *The teacher may say:* Matter has different physical and chemical properties, and these properties determine how it is classified, changed, and used. In the next phase of the lesson, you will learn more about other properties of matter and how to classify these materials according to these properties.	

	2. Unlocking Content Area Vocabulary *Unscramble Word Game* ● Introduce to the class the concept of unscramble word game. ● Present the unscrambled words to the class and ask the students to re- arrange the letters to create a word corresponding to the word given by the teacher. Meaning: It is a measure of how quickly a specific material is capable of catching fire and burning. Unscrambled word #1: **LITYMABIMALF** Answer: **FLAMMABILITY** Meaning: These are waste products, such as packaging materials, that can be slowly broken down into simple parts by chemical reactions or physical force. Unscrambled word #2: **ABLEGRADED** Answer: **DEGRADABLE** Meaning: Waste materials that can be broken down into simpler, non-toxic substances by microorganisms. Unscrambled word #3: **IOBEDGABLERAD** Answer: **BIODEGRADABLE**	The teacher will post scrambled words on the board. The teacher will give the meaning of the word then the students will arrange the letters to form the word.

C. Developing and Deepening Understanding	**SUB-TOPIC 1: "Flammability"** **1. Explicitation** ● Introduce the concept of flammability to the students, explaining how easily a material can catch fire and burn. ● Conduct a simple demonstration to enhance understanding. Show the students how a certain material, like paper, can easily burn. ● The teacher may ask the following questions during the sharing: *1. Did the material (paper) catch fire and burn? Why or why not?*	The teacher may emphasize that Paper is made from wood pulp and is used for writing, printing, and packaging. Paper is highly flammable and burns quickly when ignited. It usually burns with a bright flame and can be consumed rapidly.

	2. *What did you notice about how the material reacted to the flame?* 3. *How can we tell if a material is flammable or non-flammable?* **2. Worked Example** ***Example: A piece of wood from a tree.*** ● Wood is a natural material commonly used in construction and furniture- making. Wood is flammable and can easily catch fire when exposed to heat or flame. It burns relatively slowly, producing heat and light. Understanding the flammability of wood is crucial for fire safety in buildings and forests. ***Example: A plastic drinking straw. used in various products, including packaging, utensils, and toys.*** ● Some types of plastic are flammable and can burn when exposed to fire or high temperatures. The flammability of plastic varies depending on its composition and additives. Awareness of the flammability of plastic is essential for fire safety in buildings, transportation, and waste management. ***Example: A cotton ball.*** ● Cotton is a natural fiber obtained from the cotton plant and is used in textiles, clothing, and medical supplies. Cotton is highly flammable and burns easily when ignited. It burns quickly and can produce a hot flame. Understanding the flammability of cotton is important for safety in clothing manufacturing, bedding materials, and medical applications. ***Example: A metal paperclip.*** ● A metal paperclip. Metals are solid materials characterized by their shiny appearance, conductivity, and strength. They include iron, aluminum, copper, and gold. Most metals are non-flammable and do not catch fire under normal conditions. They have high melting points and are not easily oxidized. Recognizing the non-flammability of metals is important for fire-resistant building materials, electrical wiring, and industrial applications. **3. Lesson Activity** ● Divide the class into four (4) groups. Each member of every group will decide on the specific role that they will play within their group (*Team*	Recognizing the flammability of paper is important for fire prevention measures, especially in offices, schools, and homes. These examples illustrate how different materials exhibit varying levels of flammability and highlight the importance of understanding flammability properties for safety and practical purposes in everyday life. The roles in the "Team Jobs" may be introduced earlier to

	Jobs). Along with each role are color-coded visors with their corresponding meaning (Manager-Red; Speaker-Blue; Director-Green; Reports Coordinator-Yellow). ● Provide each group with a copy of the activity titled **"Flame Test"** Remind the teammates of their roles. ● Students perform the activity as directed and answer the questions provided in the worksheet. ● Ask the students to present their output in class. Discuss the observations with the students. Ask questions like: ● What did you notice about how each material burned? ● Did all materials burn in the same way? ● Why do you think some materials burned while others did not? ● Why is it important to be cautious around flammable materials? **DAY 2** **SUB-TOPIC 2: "How Materials React with Other Materials"** **1. Explicitation** ● Introduce to the students that materials can react with each other when they come into contact. This reaction can cause changes in the materials involved. ● To enhance understanding, conduct a simple demonstration. Show how a baking soda reacts with vinegar. ● The teacher may ask the following questions during the sharing: 1. *Did you observe any bubbles or other reactions?* 2. *How did the baking soda and vinegar react with each other when combined?*	facilitate classroom management during group activities. The roles may be assigned to other team mates on the succeeding activities. Summarize the activity by emphasizing the importance of fire safety and understanding the properties of flammable materials. Remind students to never play with fire and to always seek adult supervision when handling potentially dangerous materials. The teacher may emphasize that vinegar is a weak acid commonly used in cooking and cleaning, while baking soda is a base commonly used in baking and household cleaning. When vinegar (acetic acid) is mixed with baking soda (sodium bicarbonate), a chemical reaction occurs, producing carbon dioxide gas, water, and sodium acetate. This reaction is commonly used to create a foaming eruption, resembling a

	2. Worked Example ***Example: Rusting of iron.*** ● Iron is a metal commonly used in construction and manufacturing. When iron comes into contact with oxygen and moisture in the air, it undergoes a chemical reaction known as oxidation. This results in the formation of iron oxide, also known as rust. Understanding the reaction between iron and oxygen is crucial for preventing corrosion in metal structures and equipment. Protective coatings and proper maintenance can help mitigate rusting. ***Example: Foam production in a hydrogen peroxide and yeast experiment.*** ● Hydrogen peroxide is a chemical compound often used as a disinfectant, while yeast is a microorganism used in baking and brewing. When hydrogen peroxide is mixed with yeast, the enzyme catalase in yeast catalyzes hydrogen peroxide's decomposition into water and oxygen gas. This reaction produces foam as a result of the release of oxygen gas bubbles. Understanding the reaction between hydrogen peroxide and yeast demonstrates the role of enzymes in catalyzing chemical reactions and is commonly used in educational experiments. ***Example: Aluminum foil reacting with air.*** ● Aluminum is a lightweight metal commonly used in packaging, construction, and transportation. When aluminum comes into contact with oxygen in the air, it forms a thin layer of aluminum oxide on its surface. This layer acts as a protective barrier, preventing further oxidation. Understanding the reaction between aluminum and oxygen helps prevent corrosion and	volcano. Understanding the reaction between vinegar and baking soda demonstrates the concept of acid-base reactions and is commonly used in educational demonstrations and science experiments. These examples illustrate how materials can interact and undergo chemical reactions with other substances, leading to the formation of new products and properties. These examples demonstrate how chemical reactions between materials occur in real-life situations, affecting industries, environments, and everyday objects. Understanding these reactions is essential for various practical applications, ranging from corrosion prevention to environmental conservation and product maintenance.

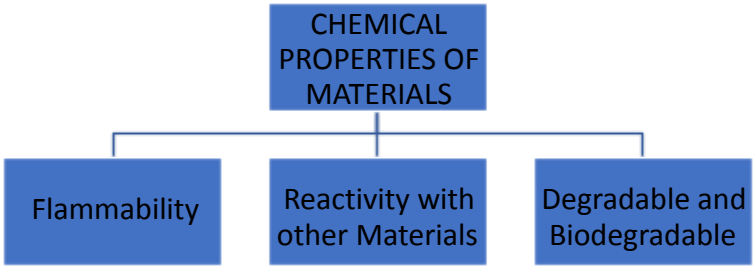
	maintain the integrity of aluminum-based products, such as aluminum foil and aluminum alloys used in aircraft construction. ***Example: Weathering of limestone by acid rain.*** ● Limestone is a sedimentary rock composed primarily of calcium carbonate. When limestone is exposed to acid rain, which contains sulfuric and nitric acids, it undergoes a chemical reaction called acid erosion. The acid reacts with the calcium carbonate in limestone, dissolving it and causing the rock to deteriorate over time. Understanding the reaction between acid rain and limestone highlights the environmental impact of air pollution on natural rock formations, historical monuments, and building materials. The reaction between acid rain and limestone highlights the environmental impact of air pollution on natural landscapes and architectural heritage. It contributes to the degradation of limestone buildings, statues, and monuments, such as the limestone facades of historic buildings and sculptures in urban environments. ***Example: Tarnishing of silver jewelry.*** ● When silver comes into contact with sulfur compounds present in the air, water, or certain materials, it undergoes a chemical reaction called tarnishing. Understanding the reaction between silver and sulfur compounds helps explain the tarnishing process and guides the proper care and maintenance of silver objects and jewelry. **3. Lesson Activity** ● Divide the class into five (5) groups. Each member of every group will decide on the specific role that they will play within their group (*Team Jobs*). Along with each role are color-coded visors with their corresponding meaning (Manager-Red; Speaker-Blue; Director-Green; Reports Coordinator-Yellow). ● Ask the students to go over Worksheet number 2 titled "*Chemical Reactions Exploration*" ● Remind the teammates of their role.	

	● Students need to perform the activity as directed and answer the questions provided in the worksheet. ● Allow the students to present their output to the class. After conducting the experiments, discuss with the students their observations. Ask questions like: ● What happened when you mixed certain materials? ● Did you observe any bubbles, color changes, or other reactions? ● How did the materials behave differently when combined? ● Can you identify any patterns or similarities in the reactions you observed? ● How might these reactions be useful in everyday life or science? **DAY 3** **SUB-TOPIC 3:** **1. Explicitation: "Degradable or Biodegradable"** ● Introduce that **degradable** materials can break down into smaller pieces over time by chemical reactions or physical force, while **biodegradable** materials can be broken down by living organisms into simpler substances. ● Conduct a simple demonstration to enhance understanding. Show the students how a certain material, like an apple core, can be decomposed. ● Ask guiding questions to prompt discussions, such as: *1. Describe the appearance of the apple core.* *2. Why is the apple core considered biodegradable?* *3. How do living organisms, such as bacteria and fungi, contribute to the biodegradation of such material?* *4. How does composting apple cores contribute to sustainable waste management?* *5. What environmental benefits result from returning nutrients to the soil through composting?* ● Facilitate a class discussion based on their observations, introducing key concepts related to the topic. ●	Summarize the activity by reinforcing the concept of reactivity and chemical reactions. Emphasize the importance of understanding how materials interact with each other and how these reactions can be used in various applications. The teacher may emphasize that the apple core is biodegradable, meaning it can be broken down by living organisms, such as bacteria and fungi, into simpler substances over time. When discarded in a natural environment, microbes in the soil break down the apple core through the process of decomposition. The organic matter in the apple core provides nutrients for soil organisms, contributing to soil health and fertility. Biodegradable materials like apple cores can be composted, returning nutrients to the soil

	2. Worked Example **DEGRADABLE** ***Example 1: Plastic Straw*** ● A plastic straw is a cylindrical tube made from plastic polymers, commonly used for drinking beverages. The plastic straw is degradable, meaning it can break down into smaller pieces over time when exposed to environmental factors such as sunlight, heat, and moisture. However, it does not break down into simpler substances through biological processes. Over time, exposure to sunlight (UV radiation) and environmental stressors can cause the plastic straw to degrade physically, resulting in fragmentation into smaller plastic particles known as microplastics. These microplastics can persist in the environment for extended periods, posing risks to wildlife and ecosystems. Understanding the degradability of plastic straws highlights the environmental challenges associated with plastic pollution and the importance of reducing single-use plastic consumption. ***Example 2: Polystyrene Foam (Styrofoam):*** ● Polystyrene foam is a lightweight plastic material commonly used for packaging and food containers. Polystyrene foam is degradable, meaning it can break down into smaller pieces over time when exposed to environmental factors such as sunlight, heat, and mechanical stress. Exposure to sunlight (UV radiation) and physical abrasion can cause polystyrene foam to degrade into smaller particles known as microplastics. These microplastics can persist in the environment and pose risks to wildlife and ecosystems. Understanding the degradability of polystyrene foam highlights the environmental challenges associated with plastic pollution and the importance of reducing single-use plastic consumption. ***Example 3: Nylon Fishing Line*** ● Nylon fishing line is a synthetic polymer material used for fishing and other recreational activities. Nylon fishing line is degradable, meaning it can break down into smaller pieces over time under environmental conditions. Exposure to sunlight (UV radiation) and mechanical stress can cause nylon fishing lines to degrade into smaller fragments. These fragments can persist	and reducing waste sent to landfills. These examples demonstrate the distinction between degradable and biodegradable materials, highlighting their different behaviors and environmental implications. Understanding these concepts is essential for promoting sustainable practices and minimizing the environmental impact of waste materials.

	in the environment and pose risks to aquatic life, such as entanglement and ingestion. Recognizing the degradability of nylon fishing lines underscores the importance of proper disposal practices and the use of eco-friendly alternatives to reduce environmental harm. **BIODEGRADABLE** ***Example 1: Paper Towel*** ● A paper towel is an absorbent sheet made from paper pulp, commonly used for cleaning and wiping surfaces. The paper towel is biodegradable, meaning it can be broken down by microorganisms into simpler organic compounds over time. When discarded in a compost pile or natural environment, microorganisms, such as bacteria and fungi, feed on the paper towel's cellulose fibers through the process of microbial decomposition. This process converts the paper towel into humus, a nutrient-rich organic material that enriches soil fertility. Biodegradable materials like paper towels can be composted, diverting organic waste from landfills and contributing to soil health and sustainable waste management practices. ***Example 2: Banana Peel*** ● A banana peel is the outer protective covering of a banana fruit. It is biodegradable, meaning microorganisms can break down the peel into simpler organic compounds over time. When discarded in a natural environment, microbes in the soil decompose the peel through microbial degradation. The organic matter in the banana peel provides nutrients for soil organisms, contributing to soil health and fertility. Biodegradable materials like banana peels can be composted, returning nutrients to the soil and reducing waste sent to landfills. ***Example 3: Cotton Fabric*** Cotton fabric is a natural textile material made from the fibers of the cotton plant. Cotton fabric is biodegradable, meaning it can be broken down by microorganisms into simpler organic compounds over time. When discarded in a natural environment, microbes in the soil decompose the cotton fabric through microbial degradation. The organic matter in the cotton fabric provides nutrients for soil organisms, contributing to soil health and fertility. Biodegradable materials like cotton fabric can be composted or naturally	

	degraded, minimizing environmental impact and promoting sustainable waste management practices. **3. Lesson Activity** ● Provide each group with a copy of the activity titled "*Exploring Degradable and Biodegradable Materials".* ● Again, remind the teammates of their role. ● Ask the students to perform the activity as directed and answer the questions provided in the worksheet. ● Ask the students to present their output to the class.	After the observation period, gather the participants to discuss their observations. Summarize the key points of the activity, emphasizing the differences between degradable and biodegradable materials. Discuss the environmental implications of using degradable and biodegradable materials. Encourage participants to consider the importance of choosing eco-friendly materials in their daily lives.

D. Making Generalizations	**DAY 4** **1. Learners' Takeaways** ● Ask the students to outline in the concept map what they have learned in the lesson. Utilize the given concept map below:  	*Note: This may be done as individual or group work.* Allow the students to demonstrate their learning by creating a graphic organizer. The teacher will provide the BIG WORDS, while the students will provide the rest of the concepts/ideas. Students may also use connecting words as needed.

	The students should be able to emphasize the following: ● **Flammability (Burnability):** Some materials can catch fire and burn when exposed to heat or flame. For example, wood, paper, and certain types of plastics can burn. This burning process is a chemical reaction where the material combines with oxygen in the air to produce heat and light. It's important to be cautious around flammable materials and to never play with fire. ● **Reactivity with Other Materials:** Materials can react with each other when they come into contact. This reaction can cause changes in the materials involved. For instance, when iron (a metal) reacts with oxygen and moisture in the air, it forms rust. Similarly, when vinegar (an acid) is mixed with baking soda (a base), it produces bubbles of carbon dioxide gas. Understanding these reactions helps us predict how materials will behave when combined. ● **Degradability and Biodegradability**: Materials can break down or decompose over time due to various factors such as exposure to sunlight, air, water, or microorganisms like bacteria and fungi. Degradable materials eventually break down into smaller pieces, while living organisms can break down biodegradable materials into simpler substances. For example, food scraps, paper, and certain types of plastics are biodegradable, meaning they can be broken down naturally by bacteria and other organisms in the environment. *These properties help us understand how different materials interact with their surroundings and with each other, which is important for various everyday activities and environmental considerations.*	

	2. Reflection on Learning ***Materials:*** Chart paper or whiteboard Markers Index cards or sticky notes Pens or pencils for each student ***Procedure:*** Introduction: ● Begin by reviewing the chemical properties of materials discussed in previous lessons, including flammability, reactivity, and degradability/biodegradability. ● Explain that today's activity will focus on reflecting on these properties and their importance. Reflection Activity: ● Divide the students into small groups of 3-4 members. ● Distribute index cards or sticky notes and pens/pencils to each student. ● Assign each group one of the following topics: flammability, reactivity with other materials, or degradability/biodegradability. ● Ask each group to brainstorm examples of materials or substances related to their assigned topic. Encourage them to think about everyday items, materials found in nature, and any relevant experiences they may have had. Provide prompts such as: ● "Think about materials that can catch fire easily." ● "Consider substances that react with other materials to produce new substances." ● "Reflect on items that break down over time, either naturally or with the help of microorganisms." ● Have each group write their examples on the index cards or sticky notes. Group Sharing: ● After brainstorming, invite each group to share their examples with the class. ● As each group presents, write their examples on the chart paper or whiteboard under the corresponding topics.	This activity is designed to encourage Grade 4 students to reflect on the chemical properties of materials, including flammability, reactivity with other materials, and degradability/biodegradability. Through guided reflection, students will deepen their understanding of these concepts and consider their implications for the environment and everyday life. Throughout the activity, provide support and guidance as needed, ensuring that all students have the opportunity to participate and contribute their ideas. Encourage a positive and respectful atmosphere where students feel comfortable sharing their thoughts and reflections.

	● Encourage students to explain why they chose each example and how it relates to the chemical properties being discussed. **Reflection and Discussion:** ● Facilitate a class discussion based on the examples shared. ● Ask guiding questions such as: ✔ *"What did you learn about the chemical properties of materials from the examples shared?"* ✔ *"How do these properties affect the way we use and interact with materials in our daily lives?"* ✔ *"Why is it important to understand the flammability, reactivity, and degradability of materials?"* ✔ *"How can we make more informed choices about the materials we use based on their chemical properties?"* ● Encourage students to share their thoughts and reflections, and prompt them to consider real-life applications and environmental implications. **Individual Reflection:** ● Have each student take a few moments to reflect individually on the discussion. ● Provide prompts for reflection, such as: ✔ *"What surprised you the most about today's discussion on chemical properties?"* ✔ *"How do you think understanding chemical properties can help us protect the environment?"* ✔ *What actions can you take to promote responsible use of materials based on their chemical properties?"* **Sharing and Closing:** ● Invite students to share their reflections with the class, either by speaking out or writing on the chart paper or whiteboard. ● Summarize the key points of the discussion and emphasize the importance of understanding chemical properties in making informed decisions and promoting environmental stewardship. ● Encourage students to apply their understanding of chemical properties to their daily lives and continue exploring the fascinating world of science.	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION	NOTES TO TEACHERS

A. Evaluating Learning	**1. Formative Assessment** **Direction**: Read each question carefully. Identify the letter of the correct answer. 1. Which of the following best describes flammability? A. The ability of a material to dissolve in water B. The ease with which a material can catch fire and burn C. The tendency of a material to react with oxygen in the air D. The ability of a material to conduct electricity 2. What is an example of a flammable material? A. Glass B. Metal C. Paper D. Rock 3. When iron reacts with oxygen and moisture in the air, what does it form? A. Aluminum oxide B. Rust C. Carbon dioxide D. Hydrogen gas 4. Which of the following materials is biodegradable? A. Plastic drinking straw B. Nylon fishing line C. Banana peel D. Styrofoam packaging 5. What happens to a banana peel when it is discarded in a natural environment? A. It remains unchanged indefinitely B. It decomposes into simpler organic compounds C. It reacts with other materials to form new substances D. It breaks down into smaller pieces over time	Assessment should be carried out throughout the lesson in the form of discussions and written responses to the various activities. **Answer Key:** 1. B 2. C 3. B 4. C 5. B 6. D 7. D 8. A 9. C 10.C

	6. Sarah wants to dispose of her plastic water bottle. Plastic is harmful to the environment, so she wants to choose a more eco-friendly option. Which of the following materials should Sarah choose if she wants a biodegradable option? A. Plastic water bottle B. Glass bottle C. Aluminum can D. Biodegradable paper cup 7. Tom is conducting an experiment in his science class. He wants to observe how different materials react with vinegar. Which of the following materials is most likely to produce bubbles when mixed with vinegar? A. Metal paperclip B. Plastic drinking straw C. Glass marble D. Cotton ball 8. Emily is decorating her room and wants to hang up some pictures using metal nails. She is worried about the nails rusting over time. What can Emily do to prevent the nails from rusting? A. Paint the nails with a waterproof sealant B. Keep the room temperature low to slow down the rusting process C. Use plastic nails instead of metal nails D. Nothing, as rusting is inevitable for metal nails 9. David is helping his mom in the kitchen. She accidentally spills some lemon juice on the marble countertop. What is likely to happen to the marble over time? A. The marble will remain unchanged B. The marble will dissolve and disappear C. The marble will develop stains and discoloration D. The marble will react with the lemon juice to form a new substance 10. Anna is packing her lunch for school. She wants to use a material for her sandwich wrapper that will break down easily when discarded. Which of the following materials should Anna choose? A. Plastic cling film B. Aluminum foil C. Biodegradable wax paper D. Styrofoam container	

	2. Homework (Optional) ***Eco-Discovery Quest:*** ● Embark on a quest to find two items in your home that hold secrets of nature's recycling magic. ● For each item, decide whether it possesses the power to break down over time (degradable), transform with the help of nature's living creatures (biodegradable), or stand resilient against the forces of time (non- degradable). Write down your findings in your adventurer's journal. ● Imagine the story behind each item's magical abilities and share a tale of their adventures in your journal. ***Submission:*** ● Craft your responses on parchment paper or type them on a mystical device. ● Present your enchanted findings with sketches, spells, and tales of wonder. ● Share your completed quest with your teacher by [insert due date].			
A. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			

B. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *<u>principles behind the teaching</u>* *What principles and beliefs informed my lesson? Why did I teach the lesson the way I did?* ▪ *<u>students</u>* *What roles did my students play in my lesson? What did my students learn? How did they learn?* ▪ *<u>ways forward</u>* *What could I have done differently? What can I explore in the next lesson?*	