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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 1
Lesson
5

Lesson Exemplar for Science 4
Quarter 1: Lesson 5 (Week 5)
S.Y. 2024-2025

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SCIENCE (CHEMISTRY) / QUARTER 1 / GRADE 4

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.** *Demonstrate ways to minimize harmful changes in materials, such as restriction of burning of waste materials, and care in handling reactive materials;* ***Learning objectives:*** *a. determine useful and harmful changes in materials;* *b. describe the harmful effects of changes in materials on the environment;* *c. enumerate ways how to minimize harmful effects in changes in properties of materials.* *d. demonstrate proper ways for handling reactive materials to prevent accidents and ensure safety*
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 use a game to recall their prior knowledge of physical and chemical changes. Game: **Change Challenge** Students identify whether a given scenario represents a physical or chemical change. **Materials Needed:** ● Flashcards or slips of paper with scenarios written on them ● Two containers labeled "Physical Change" and "Chemical Change" ● Timer (optional) **Instructions:** ● Divide the class into two teams. ● Place the "Physical Change" and "Chemical Change" containers on opposite ends of the room. ● Shuffle the flashcards or slips of paper with scenarios written on them. ● Choose a student from the first team to draw a scenario card. ● Read the scenario aloud to the class. ● The team must discuss whether the scenario describes a physical change or a chemical change and then decide which container to place the card in. ● If the team correctly identifies the type of change, they earn a point. If not, the other team has a chance to steal the point by correctly identifying the change. ● Repeat steps 4-7 with students from each team taking turns drawing scenario cards.	● The "Change Challenge" game activates students' prior knowledge by prompting them to recall examples, apply concepts, and engage in critical thinking related to physical and chemical changes. It provides an opportunity for students to build upon their existing understanding and deepen their comprehension through active participation and discussion.

	● Continue playing until all scenario cards have been used or for a set time limit. **Example Scenario Cards:** 1. You tear a piece of paper into small pieces. 2. Water boils on the stove and turns into steam. 3. Iron nails left outside begin to rust. 4. Mixing vinegar and baking soda together causes fizzing and bubbling. 5. Ice cubes melt in a glass of water. 6. A candle burns and produces heat and light. 7. Cutting vegetables into small pieces for a salad. 8. Mixing salt into a glass of water until it dissolves completely. 9. Wood is burned in a campfire and turns into ashes. 10. Milk curdles after adding lemon juice. **Variation:** Students can act out the scenarios instead of reading them from cards for a more interactive variation. This adds a fun and engaging element to the game.	
B. Establishing Lesson Purpose	**1. Lesson Purpose** *The teacher may say:* Last week you learned that matters undergo various changes when exposed to changes in temperature, which can be classified as either physical change or chemical change. In the next phase of the lesson, you will be able to know and understand how some changes in matters can have harmful effects on us humans and our environments. You will also be learning how we can minimize the harmful effects of these changes and how to properly handle reactive materials. **2. Unlocking Content Area Vocabulary** *Unscramble Word Game* ● Introduce to the class the concept of unscramble word game.	The teacher will post scrambled words on the board. The teacher

	● Present to the class the given unscrambled words and ask the students to re-arrange the letters to create a word corresponding to the meaning given by the teacher. Meaning: It is the natural home or environment of a plant, animal, or other organism. It provides the organisms that live there with food, water, shelter, and space to survive. Unscrambled word #1: **TATABHI** Answer: **HABITAT** Meaning: It is the introduction of harmful materials into the environment. Unscrambled word #2: **LUTIONLOP** Answer: **POLLUTION** Meaning: It is commonly defined as the deterioration of a material (usually a metal) or its properties because of a reaction with its environment. Unscrambled word #3: **NOISOCORRO** Answer: **CORROSION** Meaning: It is a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a bubble of life. Unscrambled word #3: **COEMETSSY** Answer: **ECOSYSTEM** Meaning: It is the chemical reaction that occurs between substances when materials burn. Unscrambled word #3: **NOIBUSTMOC** Answer: **COMBUSTION**	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: "Harmful Effect of Changes in Materials"** **1. Explicitation** ● Ask the students if they can identify if a change in material is useful or harmful to our environment.	● substances, leading to the production of unpleasant odors and the release of greenhouse gases.

- Let the students complete the table below. This can be done by the teacher together with the students or by group.
- Instructions:
  - ✔ Given the table are examples of changes in matter. Identify whether they are physical or chemical. Put a (✓) in the column if it refers to a physical or a chemical change and whether it is wanted or unwanted.
  - ✔ Justify your answers and share them with your classmates.

Effects of Change	**Physical**		**Chemical**	
Melting ice cream				
Rusting of iron nails				
Boiling water				
Burning wood in a fireplace				
Dissolving sugar in water				
Chopping vegetables				
Cooking eggs				
Mixing baking soda and vinegar				
Evaporation of puddles				
Formation of clouds				
Crystallization of sugar solution				
Decomposition of organic matter				
Ripening of fruits				
Burning of fossil fuels				

- Ripening of fruits: Unwanted chemical change - fruits produce ethylene gas, causing them to ripen and eventually spoil, resulting in food waste.
- Burning of fossil fuels: Unwanted chemical change - fossil fuels combust, releasing pollutants such as carbon dioxide, sulfur dioxide, and nitrogen oxides, contributing to air pollution and climate change.
- Digestion of food: Chemical change - food is broken down by enzymes in the digestive system, releasing nutrients for absorption into the body.

The teacher may emphasize the following:

- These harmful effects of physical changes show why it's important to take care of our planet and try to prevent too much evaporation and the melting of glaciers by using

Digestion of food					

2. Worked Example

Harmful Effects of Physical Change

1. Too Much Evaporation. Evaporation is when water turns into vapor and goes up into the air, like when a puddle dries up in the sun. Too much evaporation means a lot of water is disappearing from where it should be, like from lakes, rivers, or even the soil.

Harmful Effects:

- **Drying Up of Water Sources**: If too much water evaporates from lakes, rivers, and reservoirs, they can shrink or even disappear, making it hard for animals and people to get water to drink or for plants to grow.
- **Increase in Droughts**: When there's not enough water in the soil or in the air because of too much evaporation, it can lead to droughts, which means there's not enough water for crops to grow, causing food shortages and harming farms and farmers.

2. Melting of Glaciers: Glaciers are huge masses of ice that are very important because they store a lot of fresh water. When they melt, they turn into water, which flows into rivers and oceans.

Harmful Effects:

- **Rising Sea Levels:** When glaciers melt too fast, it adds a lot of water to the oceans, causing them to rise. This can flood coastal areas, where many people live, and can damage homes and buildings.
- **Loss of Habitat:** Animals like polar bears and seals rely on glaciers for hunting and resting. When the ice melts, they lose their homes and places to find food, making it harder for them to survive.

Harmful Effects of Chemical Change

1. Air Pollution: Chemical changes can release harmful gases into the air, like when cars burn fuel or factories produce smoke.

water wisely and reducing things that make the Earth warmer, like pollution.

- These harmful effects of chemical changes remind us of the importance of using chemicals responsibly and taking steps to protect the environment and human health.

	Harmful Effects: ● **Respiratory Problems:** Breathing in polluted air can cause coughing, asthma, and other breathing problems, making it hard for people, especially kids and older adults, to stay healthy. ● **Environmental Damage:** Polluted air can harm plants and animals, disrupt ecosystems, and even lead to global warming, which can cause extreme weather events like hurricanes and droughts. ● 2. Water Contamination: Chemical changes can also happen in water, like when factories dump waste into rivers or when fertilizers from farms wash into lakes. ***Harmful Effects:*** ● **Health Risks:** Contaminated water can make people sick if they drink it or swim in it. It can cause stomachaches, diarrhea, and even more serious illnesses. ● **Harm to Aquatic Life**: Chemicals in water can harm fish, frogs, and other aquatic animals, disrupting their habitats and causing population declines. This can affect the balance of ecosystems and reduce biodiversity. **2. Soil Degradation:** Chemical changes in the soil can occur when pesticides, herbicides, or other chemicals are used in farming or gardening. ***Harmful Effects:*** ● **Loss of Fertility:** Chemicals in the soil can kill helpful organisms like earthworms and bacteria, making it hard for plants to grow. This leads to poor crop yields and reduces the amount of food that can be grown. ● **Contamination of Food**: If plants absorb chemicals from the soil, they can end up in the food we eat. Eating food contaminated with harmful chemicals can cause health problems over time. **3. Corrosion:** Corrosion is a chemical change that happens when metals react with substances in the environment, like oxygen or water. ***Harmful Effects:*** ● Damage to Structures: Corrosion can weaken metal structures like bridges, buildings, and pipelines, leading to collapses, leaks, and other accidents.	

	● Costly Repairs: Fixing or replacing corroded metal objects can be expensive and time-consuming, especially if they're critical infrastructure or equipment. **4. Acid Rain:** Chemical reactions in the atmosphere can produce acids that fall back to Earth as rain, snow, or fog. ***Harmful Effects:*** ● **Damage to Ecosystems:** Acid rain can harm plants, trees, and aquatic life by leaching nutrients from the soil, damaging leaves and needles, and making bodies of water too acidic for fish and other organisms to survive. ● **Deterioration of Buildings and Monuments:** Acid rain can erode and corrode buildings, statues, and monuments made of stone or metal, leading to their deterioration and loss of cultural heritage. **5. Groundwater Contamination:** Chemicals from industrial spills, landfills, or agricultural runoff can seep into the ground and contaminate groundwater sources. ***Harmful Effects:*** ● Health Risks: Contaminated groundwater can pose serious health risks to humans and animals if consumed, leading to illnesses such as cancer, neurological disorders, and reproductive problems. ● Long-Term Environmental Damage: Once groundwater is contaminated, it can be difficult and costly to clean up, posing long-term risks to the environment and public health. **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 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 **"Exploring the Impact of Changes on Everyday Objects"**	Discuss the observations with the students. Ask questions like: a. What changes did you observe in the nails during the activity? b. Can you describe the differences between the nail that underwent a physical change and the one that underwent a chemical change? c. How did the appearance of the nails change after each part of the activity? Why do you think it's important to understand the differences between physical and chemical changes? d. What harmful effects did we discuss regarding physical changes, such as scratching the nail?

	• 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. **DAY 2** **SUB-TOPIC 2: "Minimizing Harmful Effects in Changes in Properties of Materials"** **1. Explicitation** • Explain the importance of minimizing harmful effects on the environment, especially from materials that don't break down easily. • Discuss the concept of recycling and how it helps reduce waste and conserve resources. • Sorting Activity: Set up a sorting station with different bins labeled for different types of recyclable materials (e.g., paper, plastic, metal). • Provide students with a variety of everyday materials and ask them to sort the items into the appropriate bins based on their recyclability. • Encourage participants to discuss why each item belongs in a particular bin and how recycling helps protect the environment. • The teacher may ask the following questions during the sharing: 1. *Why do you think we're sorting these items into different bins?* 2. *Can you explain why certain materials are recyclable while others are not?* 3. *How do you think recycling helps protect the environment?* 4. *What harmful effects can materials like plastic have on the environment if they're not properly disposed of?* 5. *How can recycling help minimize these harmful effects?* 6. *Besides recycling, what are some other ways we can reduce our impact on the environment?* **2. Worked Example** **Ways in Minimizing Harmful Effects in Changes in Properties of Materials**	e. What harmful effects did we observe regarding chemical changes, such as rusting in vinegar? f. How can we continue to raise awareness about environmental issues and encourage action within our school or community? g. Are there any additional environmental topics or issues you would like to explore in future activities or discussions? h. What steps can we take to ensure that our actions contribute to a cleaner, healthier environment for future generations? Lead a discussion about the harmful effects of materials that don't break down easily in the environment, such as plastic pollution and landfill overcrowding. Ask students to share their thoughts on why recycling is

	1. Recycling: ● Benefit to Humans: Recycling reduces the need for raw materials, lowering production costs for goods made from recycled materials. It also creates job opportunities in the recycling industry. ● Recycling conserves natural resources, reduces energy consumption, and minimizes greenhouse gas emissions associated with resource extraction and manufacturing processes. **2. Reducing Consumption:** ● By consuming less, individuals can save money, reduce clutter in their homes, and lead simpler, less stressful lifestyles. ● Reduced consumption decreases the demand for new materials, helping to conserve natural resources and minimize environmental degradation associated with resource extraction and production. **3. Reusing Items:** ● Reusing items saves money by extending the lifespan of products and reducing the need for frequent replacements. It also fosters creativity and innovation in finding new uses for old items. ● Reusing items conserves resources and reduces waste generation, lowering the burden on landfills and minimizing pollution from disposal. **4. Choosing Eco-friendly Alternatives:** ● Eco-friendly alternatives often contain fewer harmful chemicals, making them safer for human health. Reducing exposure to toxins may also promote a healthier lifestyle. ● Eco-friendly materials are typically biodegradable, compostable, or recyclable, reducing their environmental impact and promoting sustainable resource use. **5. Proper Disposal:**	important and how it can help minimize these harmful effects. Discuss other ways to minimize the environmental impact of materials, such as reducing consumption, reusing items, and choosing eco-friendly alternatives.

	• Benefit to Humans: Proper disposal practices help prevent pollution and contamination of air, water, and soil, safeguarding human health and well-being. • Proper disposal minimizes the release of hazardous substances into the environment, preserving ecosystem health and biodiversity. **6. Conservation and Preservation:** • Conservation efforts protect natural habitats and ecosystems, providing recreational opportunities, clean air and water, and essential ecosystem services that support human livelihoods. • Conservation and preservation initiatives safeguard biodiversity, mitigate climate change, and maintain ecological balance, ensuring natural systems' long-term health and resilience. **7. Education and Awareness:** • Education and awareness campaigns empower individuals to make informed choices and take action to reduce their environmental footprint, leading to healthier and more sustainable lifestyles. • Benefit to the Environment: Increased awareness fosters a culture of environmental stewardship and promotes collective efforts to address environmental challenges, leading to more effective conservation and sustainability initiatives. *Implementing these strategies can reap numerous benefits for individuals, communities, and society as a whole, ranging from cost savings and improved health to environmental protection and sustainable development.* **3. Lesson Activity** "**Environmental News Reporting: Investigating Pollution and Solutions**" • Ask the group to watch a short news report. They may then use the Internet to research news reporting techniques.	After conducting the activity, discuss with the students their insights.

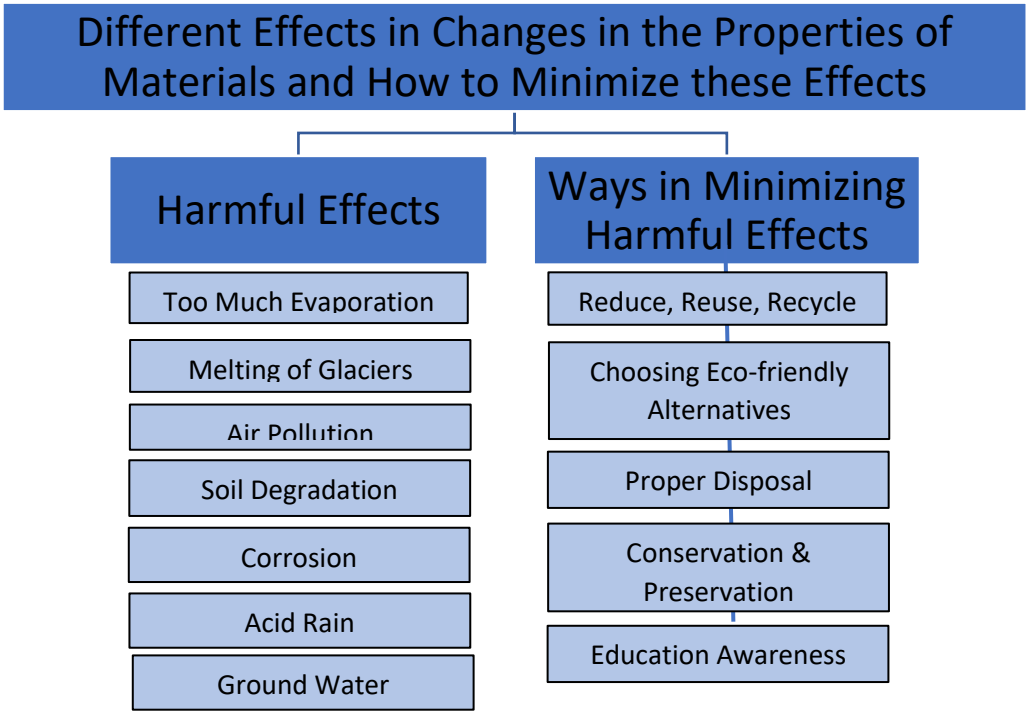
	• Students need to perform the activity as directed and answer the questions provided in the worksheet. • Allow the students to present their output to the class. • Divide the class into five (3) groups: land pollution, water pollution, and air pollution. • Each group will perform a news-reporting skit featuring the assigned topic. For example, the group assigned to air pollution will report on aerial problems in the environment. • The teacher will give the guidelines for the whole activity. • The members will be designated accordingly: a. Newscaster b. Field Reporter c. Cameramen d. Props men (materials assigned by the teacher) e. Pupils for the commercial f. Music and News Director • The news reporting will focus on how the pollution started, how it affects the environment, and how we can prevent it from happening again. • The performance will be recorded in a video, which the teacher and the class will review and comment on. **DAY 3** **SUB-TOPIC 2: "Proper Ways of Handling of Reactive Materials"** **1. Explicitation** • Explain to the students that **reactive materials** are substances that can undergo chemical reactions with other substances, often producing heat,	Ask questions like: a. What did you learn from participating in this activity? b. How did portraying real-world environmental issues through a news reporting format enhance your understanding of the topics? c. What insights did you gain about the importance of addressing environmental pollution and implementing solutions? d. How can the information presented in the news reports be applied to real-life situations or environmental advocacy efforts? e. What actions can individuals, communities, or governments take to address the environmental issues discussed in the activity? b. How do you plan to contribute to reducing pollution and promoting environmental sustainability in your own life? Summarize the key points of the demonstration, emphasizing the importance of proper handling

	light, gas, or even explosions. These reactions can occur when the reactive material comes into contact with air, water, or another chemical. ● Conduct a simple demonstration activity using common household materials, this time showcasing the reaction between hydrogen peroxide and yeast. ✔ Start by pouring the hydrogen peroxide solution into a clear container or bowl. ✔ Next, add the warm water to the hydrogen peroxide and mix well. ✔ Finally, add the dry yeast to the mixture and observe the reaction. ✔ As the yeast mixes with the hydrogen peroxide solution, it catalyzes the decomposition of hydrogen peroxide into oxygen gas and water. This produces a foamy, bubbling reaction. ● While the reaction is safe and non-toxic, remind your audience of some safety tips: ✔ Avoid inhaling the gas produced during the reaction. ✔ Do not taste or ingest the mixture. ✔ Wash hands thoroughly after handling chemicals. ● Have a brief discussion with the students about what they observed during the demonstration. Ask questions like: 1. *What happened when we mixed the yeast with the hydrogen peroxide solution?* 2. *Why do you think the mixture foamed and bubbled up?* 3. *What safety precautions did we take during the demonstration?* **2. Worked Example** **Examples of reactive materials and how to properly handle these materials:** **1. Bleach:** Bleach is a common household cleaner that contains sodium hypochlorite, which can react with acids (like vinegar) to produce chlorine gas, a toxic substance.	and safety when working with reactive materials. This activity provides an engaging way to demonstrate a chemical reaction using household materials while reinforcing important safety practices.

	✔ Always use bleach in a well-ventilated area to prevent the buildup of chlorine gas. ✔ Never mix bleach with acids (like vinegar) or ammonia-based cleaners to avoid the production of toxic gases. ✔ Wear gloves and protective eyewear to avoid skin and eye irritation when handling bleach. ✔ Follow the manufacturer's instructions for dilution and usage carefully. **2. Ammonia:** Ammonia is often found in household cleaning products. It can react with bleach to produce toxic chloramine vapors. ✔ Use ammonia-based cleaners in well-ventilated areas to prevent inhalation of fumes. ✔ Never mix ammonia with bleach, as this can produce toxic chloramine vapors. ✔ Wear gloves and protective eyewear to prevent skin and eye irritation when handling ammonia. ✔ Store ammonia-based cleaners in a cool, dry place away from direct sunlight and sources of heat. **3. Aluminum Foil**: Aluminum foil can react with acidic foods like tomatoes or citrus fruits, releasing hydrogen gas. ✔ Avoid using aluminum foil with acidic foods to prevent the release of hydrogen gas. ✔ Store aluminum foil in a cool, dry place away from sources of moisture to prevent corrosion. **4. Batteries:** Household batteries contain reactive materials like lithium, zinc, or alkaline electrolytes. If batteries are damaged or improperly disposed of, they can leak corrosive chemicals or even explode. ✔ Handle batteries with care and avoid damaging them to prevent leaks or explosions.	

	✔ Store batteries in a cool, dry place away from direct sunlight and sources of heat. ✔ Dispose of batteries properly according to local regulations, and never incinerate them. **5. Drain Cleaners:** Drain cleaners often contain highly reactive chemicals like sodium hydroxide or sulfuric acid, which can cause burns if not handled properly. ✔ Use drain cleaners in a well-ventilated area and avoid inhaling fumes. ✔ Wear gloves and protective eyewear when handling drain cleaners to prevent skin and eye irritation. ✔ Never mix drain cleaners with other chemicals, as this can produce hazardous reactions. **6. Oven Cleaners**: Oven cleaners may contain strong alkalis like sodium hydroxide, which can react with organic matter to dissolve grease and grime. ✔ Use oven cleaners according to the manufacturer's instructions and avoid prolonged skin contact. ✔ Wear gloves and protective eyewear when handling oven cleaners to prevent skin and eye irritation. ✔ Ensure proper ventilation when using oven cleaners to avoid inhaling fumes. **7. Hydrogen Peroxide:** Hydrogen peroxide, commonly used as a disinfectant, can react with certain metals (like copper or iron) to produce oxygen gas. ✔ Handle hydrogen peroxide with care and avoid contact with metals to prevent the production of oxygen gas. ✔ Store hydrogen peroxide in a cool, dark place away from sources of heat and light. ✔ Do not mix hydrogen peroxide with other chemicals unless directed to do so by a qualified professional. **8. Matches and Lighters:** Matches and lighters contain reactive materials like phosphorus or flammable gases, which ignite when struck or activated.	

	✔ Store matches and lighters in a safe place out of children's reach and away from heat sources. ✔ Handle matches and lighters with care to prevent accidental ignition. ✔ Never leave matches or lighters unattended, and ensure they are fully extinguished after use. **9. Household Cleaners:** Many household cleaners contain reactive chemicals such as acids, bases, or oxidizing agents, which can be hazardous if mixed together or handled improperly. ✔ Read and follow the manufacturer's instructions for proper usage and storage of household cleaners. ✔ Avoid mixing different household cleaners together to prevent hazardous reactions. ✔ Wear gloves and protective eyewear to avoid skin and eye irritation when handling household cleaners. **3. Lesson Activity** ● Divide the class into four (4) groups. Assign specific roles to each participant, such as the handler of the reactive material, observers, safety officers, etc. ● Provide each group with guidelines for the role-play activity, including the topic "**Proper Ways of Handling Reactive Materials**." ● Assign each group a specific reactive household material to focus on for their role-play (e.g., bleach, ammonia, batteries, etc.). ● Allocate sufficient time for groups to research their assigned material and develop their role-play script and performance. ● Each group will perform a role-play skit demonstrating the proper handling of the assigned reactive household material. ● Students enact the handling process, following proper procedures for containment, transportation, and manipulation of the reactive material. ● Include a segment where participants respond to simulated emergencies or unexpected reactions, emphasizing the importance of quick and appropriate action.	Guide Questions: 1. What type of reactive material were you handling? 2. How did you identify its properties and potential hazards? 3. What safety precautions did you take before handling the reactive material? 4. Were there any additional safety measures you could have implemented? 5. Describe the techniques you used to safely handle the reactive material. 6. Were there any challenges or difficulties encountered during the process? 7. How did you respond to simulated emergencies or unexpected reactions? 8. What steps did you take to ensure the safety of yourself and others? 9. What lessons did you learn about handling reactive materials safely?

	• Encourage creativity and engagement in the role-play, such as incorporating dialogue, demonstrations, and interactive elements to convey the message effectively. *Encourage participants to engage in critical thinking and discussion when answering these guide questions, emphasizing the importance of continuous improvement and safety awareness in handling reactive materials.*	10. How can these lessons be applied to real-life situations involving reactive materials?
D. Making Generalizations	**DAY 4** **1. Learners' Takeaways** • Ask the students to outline in the graphic organizer what they have learned in the lesson. Utilize the graphic organizer 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.

PROPER WAYS OF HANDLING REACTIVE MATERIALS

Understand that some materials can react and change quickly. These materials might fizz, bubble, or even produce heat or smoke.

When handling anything that could be reactive, wear safety gear like goggles and gloves to protect your eyes and skin.

Keep your workspace neat and tidy. Make sure bottles and containers are labeled properly so you know what's inside.

If you're not sure about something or if you see something strange happening, ask your teacher for help. It's better to ask questions than to guess and get hurt.

After you finish your experiment, clean up any spills or messes right away. Dispose of any leftover materials properly, following your teacher's instructions.

Remember, safety is the most important thing when working with any materials. Always be responsible and cautious.

2. Reflection on Learning

- Provide each student with a worksheet or journal entry template.
- Prompt students to reflect on what they have learned about minimizing the harmful effects of changes in materials. Encourage them to think about why it's important and how they can make a difference.
- Ask students to write a short reflection (1-2 paragraphs) on their understanding of the topic. They can consider questions such as:

	1. What are some examples of changes in materials that can be harmful to the environment? 2. Why is it important to minimize these harmful effects? 3. How do you think individuals can contribute to minimizing the harmful effects of changes in materials? • Students can share their reflections and action plans with a partner or small group if time allows. This provides an opportunity for discussion and feedback.	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Part I – Multiple Choice** **Direction**: Read each question carefully. Identify the letter of the correct answer. 1. What harmful effects can occur due to too much evaporation of water sources? A) Increase in rainfall B) Drying up of water sources C) Decrease in droughts D) Growth of aquatic life 2. What harmful effects can result from the melting of glaciers? A) Decrease in sea levels B) Loss of habitat for aquatic animals C) Reduction in coastal flooding D) Increase in freshwater availability 3. What harmful effects are caused by corrosion as a chemical change? A) Strengthening of metal structures B) Damage to structures like bridges and buildings C) Decrease in repair costs	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. B 3. B 4. C 5. B 6. C 7. B 8. B 9. B 10. C

	D) Preservation of metal objects 4. What harmful effects can result from acid rain as a chemical change? A) Preservation of buildings and monuments B) Promotion of aquatic life C) Damage to ecosystems and buildings D) Increase in soil nutrients 5. How can recycling benefit humans in minimizing the harmful effects of changes in materials? A) By increasing pollution B) By reducing the need for raw materials and creating job opportunities C) By depleting natural resources D) By increasing energy consumption 6. What is a practical action for minimizing the harmful effects of changes in materials? A) Consuming more resources B) Using disposable items frequently C) Reducing consumption D) Increasing waste generation 7. How can choosing eco-friendly alternatives minimize the harmful effects of changes in materials? A) By increasing greenhouse gas emissions B) By promoting a healthier lifestyle and reducing exposure to toxins C) By degrading natural habitats D) By increasing pollution 8. What is the benefit of proper disposal in minimizing the harmful effects of changes in materials? A) Increase in pollution B) Preservation of ecosystems C) Degradation of soil D) Harm to human health	

	9. Sarah lives in a city where there's heavy air pollution due to vehicle emissions and industrial activities. She often experiences coughing and breathing difficulties. What could be the cause of her health issues? A) Increased biodiversity B) Respiratory problems C) Environmental preservation D) Improved respiratory health 10. John's family runs a farm, and they use a lot of pesticides to protect their crops from pests. Recently, they noticed that some of their vegetables have traces of harmful chemicals. What could be the consequence of consuming these contaminated vegetables? A) Increase in soil fertility B) Growth of beneficial organisms C) Contamination of food D) Improvement in crop yields **Part I – Essay** ● Imagine you are working in a science lab, and you need to conduct an experiment using reactive materials. One of your classmates accidentally spills a reactive substance on the floor. Describe step-by-step what you would do to ensure everyone's safety and properly clean up the spill. **2. Homework (Optional)** *Poster Creation* ● Divide the class into small groups and provide them with poster board and art supplies. ● Instruct each group to create a poster illustrating ways to minimize the harmful effects of materials on the environment.	

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- Encourage participants to include drawings, slogans, and tips for recycling and reducing waste.
- Presentation (Optional):

Allow each group to present their posters to the rest of the participants.

- *After each presentation, facilitate a brief discussion about the ideas presented on the poster and how they can be applied in everyday life.*

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<tr><td rowspan="5">A. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5"></td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>B. Teacher's Reflection</td><td colspan="3">

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?

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