

LESSON PLAN TEMPLATE

Lesson Title	Chemical Solutions and Safety: From Household Science to Environmental Resilience
Learning Area/s	General Science
Name of Teacher/s	DEPED TAMBAYAN PH
Grade Level and Section	Grade 11
No. of Sessions	4 Sessions
References	Lesson Exemplar (LE) Uploaded Files: SHS_GS_Q2_LE2.pdf, SHS_GS_Q2_LE4.pdf, SHS_GS_Q2_LE6.pdf, SHS_GS_Q2_LE7.pdf, SHS_GS_Q2_LE8.pdf, SHS_GS_Q2_LE9.pdf, SHS_GS_Q2_LE10.pdf
Declaration of AI use	This lesson plan was co-created using Gemini AI to assist with unpacking competencies into a 4-session learning design, structuring activities, and assessment formulation.

Intentions.

Meaningful learning experiences are anchored in how we frame them. Start by deciding what you want learners to master by the end of the lesson – keep it clear and simple.

Learning Competency and Curriculum Standards:	<p>Learning Competency:</p> <ul style="list-style-type: none"> • Explain the characteristics of solutions and their examples in household products, industry, and environmental science; • Apply best practices in the proper handling, storage, and disposal of chemicals; <p>Content Standards: Chemical reactions are part of human activities and present in the environment. Chemicals should be handled safely, and solutions can have beneficial and harmful environmental effects. All levels of life have systems of related parts. Structures and functions are related at all levels of the organization of life. Cells carry out functions that enable organisms to survive. Organ systems work together to carry out essential functions of an organism. Climate change affects ecosystems and the organisms living in them. Ecosystems are finite and have limited resources.</p> <p>Performance Standards: By the end of the term, learners apply research skills to discover how scientists have impacted our lives. They recognize the significant role of different agencies in the Philippines, such as DOST and DTI, in scientific innovation and development. They</p>
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	<p>show critical thinking in explaining the different substances in household and personal care products, including their benefits and potential risks of using and disposing of them. They demonstrate appropriate and safe handling and use of chemicals. They explain that chemical reactions occur in human activities and the environment, and that several chemical solutions pose a threat to the community. They use examples to describe the relationships among living systems and their components and how the structure of a part relates to its function. They explain the role of cells in perpetuating life and how organ systems work together to maintain optimal health. They conduct investigations on the effects of climate change on local ecosystems.</p>			
	Session 1	Session 2	Session 3	Session 4
Learning Objectives:	<ol style="list-style-type: none"> 1. Define a solution and describe its observable characteristics in household contexts. 2. Differentiate solutions from suspensions and colloids using simple diagnostic tests like the Tyndall effect. 3. Identify solutes and solvents in common Filipino household and industrial products. 	<ol style="list-style-type: none"> 1. Classify household and industrial chemicals as hazardous or non-hazardous based on standardized labels. 2. Explain safety protocols for the handling, storage, and disposal of chemicals in alignment with Republic Act 6969. 3. Demonstrate best practices in spill management and emergency response. 	<ol style="list-style-type: none"> 1. Investigate the effects of varying salt concentrations on plant growth. 2. Formulate a testable hypothesis regarding osmotic stress and plant survival in saline conditions. 3. Systematically collect and analyze data from a controlled experiment. 	<ol style="list-style-type: none"> 1. Analyze the impact of wastewater and saltwater on local ecosystems like mangroves and farmlands. 2. Recommend evidence-based solutions to mitigate the negative impacts of improper wastewater disposal. 3. Design a simple filtration system using local materials to model water treatment.
Learner Context:	<p>Learners demonstrate high engagement in hands-on activities but often struggle with scientific terminology in English. They show a strong interest in local household products (e.g., patis, suka, and detergents). Barriers include limited prior experience with</p>	<p>Learners are familiar with household brands but frequently ignore precautionary symbols. They are strengths in collaborative peer-to-peer activities. A barrier for some is the lack of proper storage areas at home, making real-world application difficult without creative</p>	<p>Learners in this community are deeply connected to agriculture and coastal resources. They possess practical knowledge of gardening but require guidance in scientific experimental design. Some learners with learning disabilities may need simplified data</p>	<p>Learners show strong advocacy for their local environment (e.g., nearby rivers or beaches). They are effective communicators in the local dialect but need support translating findings into technical reports. Barriers include limited access to high-tech water testing kits.</p>

	formal laboratory equipment and some learners requiring scaffolding for abstract concepts like molecular dissolution.	local adaptations.	recording tools (e.g., color-coding instead of complex numbering).	
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Learning Experience.

A learning experience is like a thoughtfully designed journey. Each activity and interaction builds towards meaningful understanding and growth. Identify activities and interactions to help learners gain knowledge, skills, or understanding in a purposeful way.

Pre-Lesson:	ABC of Home Essentials: Students identify household chemicals starting with randomly selected letters and explain their daily uses in the community.	Container Visual Investigation: Students look for warning signs (flammable, toxic, corrosive) on provided empty product containers.	Nature's Recipe: Students create an infographic of the essential growth factors for plants (sunlight, water, nutrients).	Waters Apart: A comparison table brainstorming the differences between clear saltwater and murky wastewater.
Flow:	1. Activating Prior Knowledge: Image analysis of common Filipino mixtures (rubbing alcohol, milk tea, coffee). 2. Scaffolding: Teacher-led demonstration of dissolving sugar in water versus soil in water to define homogeneous vs. heterogeneous. 3. Active Retrieval: 'Making Drinks' activity where groups mix salt, milk powder, and oil in water. 4. Checks for Understanding:	1. Active Retrieval: Game 'Ka Na Ba?' where students line up to classify images as hazardous or not. 2. Scaffolding: Explicit instruction on the GHS (Globally Harmonized System) symbols and the significance of RA 6969 in the Philippines. 3. Social Learning: Sorting Game where pairs categorize items (bleach, acetone, baking soda) into safe/unsafe	1. Activating Prior Knowledge: Reading 'Salty Harvest' narrative about salt intrusion in rice fields. 2. Scaffolding: Guided discussion on osmosis and ion toxicity. 3. Social Learning: Setup of the 'Salt Trials' experiment using mung beans and varying concentrations (0%, 1%, 5%). 4. Checks for Understanding: Students identify independent, dependent, and	1. Active Retrieval: Review of results from the Salt Trials (Session 3). 2. Scaffolding: Analysis of 'Environmental Headlines' (e.g., Boracay wastewater issues). 3. Social Learning: Collaborative design of a DIY filtration system using sand, charcoal, and pebbles. 4. Checks for Understanding: Justifying the

	<p>Tyndall effect test using a laser pointer to observe light scattering in the prepared mixtures.</p> <p>5. Social Learning: Collaborative matching of terms (Solute, Solvent, Solution) to the experimental results.</p>	<p>storage locations.</p> <p>4. Checks for Understanding: Situational cards (e.g., 'What to do if you spill bleach on your skin?').</p> <p>5. Step-by-Step Procedure: Demonstration of proper labeling for repackaged chemicals.</p>	<p>controlled variables in their group setups.</p> <p>5. Active Retrieval: Daily observation and logging in the Mean Plant Height table.</p>	<p>placement of filtration layers based on particle size.</p> <p>5. Social Learning: Groups draft a 'Community Recommendation Table' for local leaders.</p>
Learning Resources:	Laptop, Projector, Beakers/Clear glasses, Laser pointer, Salt, Sugar, Coffee, Milk powder, Soil, Vinegar.	Empty containers of bleach, muriatic acid, and alcohol; GHS symbol charts; Powerpoint; Meta-cards.	Mung bean seeds, Salt, Distilled water, Plastic cups, Ruler, Data logging worksheets.	Plastic bottles, Sand, Charcoal, Pebbles, Cotton, Murky water samples, News clippings.
Opportunities for integration:	Health (distinguishing between safe and unsafe mixtures for consumption); Mathematics (calculating volume/mass concentrations).	Araling Panlipunan (Environmental laws like RA 6969); Health (First aid for chemical exposure).	Economics/Agriculture (impact of salinity on crop yield); Communication Arts (narrative analysis of farming stories).	Science-Technology-Society (Innovation in water resilience); Empowerment Technologies (Creating digital advocacy posters).
<p>Assessment.</p> <p>Assessments reveal what learners have gained and what they still need help with. These are helpful in providing you with information to guide your future instruction throughout the entire session.</p>				
Formative Assessment:	Mixture Characterization Table: Students fill out a table identifying which prepared mixtures are true solutions based on uniformity, Tyndall effect, and filtration results.	Chemical Life Cycle Profiling: Students complete a matrix describing a specific product's handling, storage, disposal, and spill management protocols.	Experimental Design Worksheet: Review of group hypotheses and variable identification to ensure scientific accuracy before data collection continues.	Ecosystem Impact Table and Mitigation Recommendations: A comprehensive table organizing the causes, effects, and suggested community actions for water pollution.

Ways Forward.

Meaningful learning can also happen beyond the classroom – for both the learners and the teacher. Pause and reflect on what happened today.

Extended learning opportunities:	Home Solution Audit: Students list five true solutions found in their kitchens and identify the active ingredients on their labels.	Barangay Safety Walk: Students observe and interview local store owners or households about how they dispose of batteries and paints.	Data Monitoring: Students continue logging daily plant growth data for one week and take photos of visible stress signs (yellowing, wilting).	Advocacy Project: Create an infographic poster for the school bulletin promoting 'Zero Chemical Disposal' in school sinks.
Reflections:	How did the Tyndall effect help you distinguish solutions from colloids? Which part of the drink-making activity was most challenging to categorize?	What is the most dangerous chemical habit you observed in your community? How can the knowledge of GHS symbols protect your family?	Why did we use distilled water as a control? How does the 'Salty Harvest' story change your perspective on coastal farming challenges?	What role does individual responsibility play in preventing wastewater pollution? How can your DIY filter design be improved for community-wide use?