

LESSON PLAN TEMPLATE

Lesson Title	Green Blueprints: Planning an Investigation on Photosynthesis Raw Materials
Learning Area/s	Science
Name of Teacher/s	DEPED TAMBAYAN PH (Visit www.depedtambayanph.net for more downloads.)
Grade Level and Section	Grade 8
No. of Sessions	4 Sessions
References	None specified
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:	Learning Competency: ● Plan a scientific investigation to verify the raw materials needed for photosynthesis. Content Standards: ● Organ systems work together for the growth and survival of the organism. ● Inherited traits passed from parents to offspring are governed by the rules on the patterns of inheritance. ● Classification of living things shows life's diversity. ● Photosynthesis and respiration are processes that show how living things obtain energy and nutrients from the environment. ● The use of timeline and charts can illustrate scientific knowledge of the structure of the atom has evolved over time. ● The current structure of the atom includes subatomic particles, their symbol, mass, charge, and location. Performance Standards: By the end of the Term, learners demonstrate the use of models, flow charts, and diagrams to illustrate how body systems work together for the growth and survival of an organism. They represent patterns of inheritance and predict simple ratios of offspring. They explain that the classification of living things shows the diversity and unity of living things. They describe the processes of respiration and photosynthesis
--	--

	and plan and record a scientific investigation to verify the raw materials needed. They use flow charts and diagrams to explain cycles in nature. They demonstrate an understanding of the structure of the atom and how our understandings have changed over time. They draw models of the atom and use tables to represent the properties of subatomic particles.			
	Session 1	Session 2	Session 3	Session 4
Learning Objectives:	- Identify the raw materials (Carbon Dioxide, Water, Sunlight, and Chlorophyll) necessary for the process of photosynthesis. - Explain the significance of each raw material in the energy-making process of plants within the local ecosystem.	- Formulate testable hypotheses regarding the necessity of specific raw materials for photosynthesis. - Identify independent, dependent, and controlled variables in a proposed plant investigation.	- Design a step-by-step methodology for a scientific investigation to verify the need for a specific raw material in photosynthesis. - Select appropriate local and recyclable materials for the investigation plan.	- Critique and refine scientific investigation plans based on peer feedback and a standardized rubric. - Present a finalized investigation plan that demonstrates a clear understanding of photosynthesis raw materials.
Learner Context:	Learners show a strong interest in the local flora found in the school garden. While they can identify common plants like Mayana and San Francisco, many struggle to connect abstract chemical formulas to the physical growth of these plants. A significant portion of the class prefers visual	The learners are enthusiastic about hands-on activities but often find it difficult to distinguish between 'what they change' and 'what they observe' in an experiment. They respond well to collaborative tasks and enjoy debating their predictions. Some learners with lower numeracy levels may find the	The class exhibits high creativity when asked to use local materials. However, their writing can be disorganized when listing instructions. They perform better when they can visualize the steps through drawings. A few learners have physical coordination challenges and	Learners are generally supportive of each other but can be shy when presenting in front of the class. They value recognition of their hard work. Some students may struggle with receiving critical feedback, so the environment must be kept positive and constructive.

	representations over text-heavy explanations, and a few learners require simplified terminology due to varying literacy levels.	concept of 'controlled variables' abstract and need concrete examples.	may need assistance in handling delicate equipment or sketching.	
--	---	--	--	--

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:	● Photo-Sort Challenge: Students are shown images of various items (stones, water, sunlight, soil, air, insects) and must categorize which ones they believe a plant 'eats' or 'breathes' to grow.	● Predict-Observe-Explain (POE): Show two identical plants; one is covered with a black cloth. Ask: 'What will happen to this plant after 3 days?'	● Methodology Mix-Up: Provide scrambled steps of a simple task (like making kalamansi juice) and ask students to reorder them logically.	● Gallery Walk Preparation : Groups finalize their posters or presentations, ensuring all components from the previous sessions are included.
Flow:	Introduction (Scaffolding): Review the basic parts of a plant and their functions using a real potted plant from the garden. Connect the roots to water absorption and leaves to light capture. Active Retrieval: Use a	Modeling: The teacher demonstrates how to turn a question (e.g., 'Do plants need light?') into a formal hypothesis using the 'If... then...' format. Social Learning: In small groups, learners are assigned one raw material (Light,	Scaffolding: Provide a standard 'Experimental Design Template' that includes sections for Title, Materials, and Numbered Procedures. Creative Design: Groups draft their methodology. Encourage the use of locally available	Social Learning: Conduct a 'Scientific Fair' Gallery Walk. Each group displays their plan. Half the group stays to explain, while the other half rotates to review other plans using 'Praise and Polish' sticky notes. Active Retrieval:

	'Think-Pair-Share' strategy where learners discuss what happens to a plant when it is kept inside a dark cabinet versus placed under the sun. Direct Instruction: Present the 'Photosynthesis Recipe Card' (the chemical equation) using local analogies, such as cooking rice, to explain how ingredients (raw materials) are transformed. Check for Understanding: Flashcard drill where students hold up cards representing different raw materials when the teacher describes their specific role (e.g., 'I am the gas absorbed from the air').	CO₂, or Chlorophyll). They must brainstorm a hypothesis and identify the variables for an experiment testing that specific material. Scaffolding: Provide a 'Variable Matrix' worksheet where students can drag and drop (or write) local materials like 'tuyo jars' or 'plastic bottles' into categories of Independent or Controlled variables. Check for Understanding: 'Variable Swap'—groups present their variables to another group for a quick critique and feedback session.	materials such as 'empty sardine cans' for pots, 'recycled plastic sheets' for covers, or 'Lugol's solution' (if available) for starch testing. Checks for Understanding: The teacher circulates and asks groups to 'walk through' their procedure orally to identify any missing steps or safety concerns (e.g., handling alcohol or fire). Social Learning: Peer-to-peer consultation where groups exchange drafts to see if the instructions are clear enough for someone else to follow.	During the presentations, the teacher asks 'Cold Call' questions to students to explain why a certain material or step was included (e.g., 'Why did you use a black paper to cover the leaf?'). Refinement: Groups return to their stations to incorporate the feedback received from peers and the teacher into their final written plan. Conclusion: Synthesis of how planning an investigation is a vital skill for scientists to discover truths about the natural world.
Learning Resources:	• Real potted plants (Mayana or San Francisco) • Slide presentation on Photosynthesis • Printed 'Recipe Cards' for Photosynthesis • Whiteboard and markers	• Worksheets on Variables and Hypotheses • Sample experimental setups (images or physical props like jars and cloths) • Projector for visual modeling	• Experimental Design Templates • Local materials for demonstration (jars, cardboard, tape, leaves) • Safety guidelines poster	• Manila paper/Carolina • Markers and art materials • Feedback Rubric for Scientific Investigations • Sticky notes

Opportunities for integration:	Health & Environment: Discussion on how planting trees in the community helps reduce carbon dioxide levels and provides oxygen for the neighborhood.	Language Arts: Developing logical reasoning and 'If-Then' sentence structures, enhancing their argumentative writing skills.	Art/Drawing: Students are encouraged to illustrate their experimental setup to enhance clarity and visual communication.	Social Studies/Civics: Discussing the importance of evidence-based decisions in community projects, such as local farming or urban gardening.
Assessment. 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.				
Formative Assessment:	Exit Ticket: Learners must list the four essential raw materials and draw a simple arrow diagram showing how these materials enter a leaf.	Hypothesis Draft: Each group submits a written hypothesis and a list of identified variables for their assigned raw material.	Procedural Draft: A complete draft of the experimental procedure, including a list of materials and a diagram of the setup.	Final Investigation Portfolio: A complete, corrected scientific investigation plan (Hypothesis, Variables, Materials, Procedure, and Diagram).
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:	Assign learners to observe plants in their own backyard or street and list down three factors they see affecting the plant's growth (e.g., shade from a tall building, proximity to a water source).	Learners are encouraged to watch a short video clip (if internet is available) or read a textbook chapter on historical photosynthesis experiments like those by Jan Baptista van Helmont.	Challenge advanced learners to include a 'Control Group' in their design and explain why it is necessary for a valid scientific conclusion.	Invite learners to actually set up their experiment at home (if safe) and bring their observations/results back to class in the following week.
Reflections:	Reflect on whether the use of the	Assess if the 'Variable Matrix'	Observe if the integration of	Evaluate the quality of peer

	'cooking' analogy helped the visual learners bridge the gap between the chemical equation and the physical process.	effectively scaffolded the distinction between independent and dependent variables for the struggling learners.	drawing helped the learners with lower literacy skills to communicate their scientific ideas more effectively.	feedback—did the learners provide substantive suggestions or just surface-level comments? Adjust the peer-review process for future units.
--	---	---	--	--