

LESSON PLAN TEMPLATE

Lesson Title	Maintaining Balance: The Science of Homeostasis in the Human Body
Learning Area/s	Science
Name of Teacher/s	DEPED TAMBAYAN PH (Visit www.depedtambayanph.net)
Grade Level and Section	Grade 10
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: Describe homeostasis as a state of balance among all the body systems in humans that needs to be maintained for survival and proper functioning; its indicators include body temperature, glucose level, and blood pressure. Content Standards: • Several simple observations indicate if a chemical reaction has taken place. • Chemical indicators produce color changes with acids, bases, and salts. • Valid and reliable scientific investigations identify the dependent and independent variables and control other variables. • Many types of chemical reactions are important in our daily lives and in the biotic and abiotic parts of the environment. • Atoms rearrange during chemical reactions but abide by the principle of conservation of mass as illustrated in balanced chemical equations. • Rates of chemical reactions are critical in production and preservation of many useful materials. • Homeostasis is a self - regulating process that allows an organism to maintain stability. • Several theories provide lines of evidence about how organisms evolve. Performance Standards: By the end of the term, learners use household products as indicators to identify acids, bases, and salts and describe indicators that a chemical reaction has occurred. They describe important types of chemical reactions, use chemical equations and
--	--

	conservation of mass to represent and balance reactions, and explain impacts on the natural and built environments using secondary sources. Also, learners explain factors affecting reaction rates and exothermic and endothermic reactions, demonstrate valid and reliable investigations, describe homeostasis and feedback mechanisms, and explain biotechnology by identifying traditional and modern examples and debating societal, environmental, and ethical implications.			
	Session 1	Session 2	Session 3	Session 4
Learning Objectives:	- Define homeostasis as a state of internal balance. - Explain the importance of feedback mechanisms in maintaining stability. - Relate the concept of equilibrium to everyday Filipino household activities.	- Describe how the body regulates temperature (Thermoregulation). - Identify shivering and sweating as homeostatic responses to external environment changes. - Analyze the body's response to the tropical Philippine climate.	- Explain the regulation of blood glucose levels through insulin and glucagon. - Describe how blood pressure is maintained as a homeostatic indicator. - Relate glucose regulation to common Filipino dietary habits.	- Synthesize how multiple body systems work together to achieve homeostasis. - Evaluate the consequences of homeostatic failure on human survival. - Demonstrate a valid investigation into heart rate changes after physical exertion.
Learner Context:	The learners are Grade 10 students who generally demonstrate high engagement during hands-on activities but struggle with abstract physiological concepts. Recently, they have shown a preference for visual aids and relate well to mechanical	Learners have shown significant interest in how their bodies react during PE classes held in the humid afternoon. They are observant of physical changes like sweating but often lack the scientific vocabulary to describe these as regulatory processes. Some	Learners are highly motivated when topics relate to family health, as many have relatives with diabetes or hypertension. They are familiar with the terms 'high blood' and 'sugar', but need help understanding the biological mechanisms. Barriers include the	Learners show strength in collaborative lab-style activities. However, synthesizing information from the previous three days into a single 'big picture' can be a barrier for those with lower cognitive processing speeds. They enjoy movement-based

	analogies. A few learners exhibit barriers in English literacy, requiring simplified explanations of technical terms. Most students are familiar with the concept of 'balance' through sports and traditional games like 'Luksong Baka' and 'Sipa'.	students may have difficulty distinguishing between voluntary and involuntary responses.	complexity of hormonal interactions (insulin vs. glucagon).	learning.
--	---	--	---	-----------

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:	● Active Retrieval: The 'Statue Game' - Students must balance on one leg and maintain a specific pose for 30 seconds. ● Discussion : Ask students: 'What did your muscles do to keep you from falling?' to introduce the idea of constant adjustment.	● Active Retrieval: Ask: 'What happens to your body when you wait for a jeepney under the hot noon sun versus entering an air-conditioned mall?' ● Quick Poll: Show of hands on who prefers cold vs. hot weather and why.	● Active Retrieval: Brainstorming: 'What are common high-sugar foods we eat?' (e.g., kakanin, soft drinks, white rice). ● Prediction: Ask: 'What do you think happens to all that sugar once it enters your blood?'	● Active Retrieval: 'Indicator Relay' - Students must quickly categorize cards into 'Temperature', 'Glucose', or 'Blood Pressure' categories based on descriptions. ● Hook: Ask: 'What happens if the balance is broken and cannot be fixed?'
Flow:	● Scaffolding	● Direct	● Direct	● Hands-on

	: Present a visual analogy of a 'Batya' (water basin) being filled; if it overflows, we stop the tap. Explain this as a feedback loop. ● Direct Instruction: Using a slide presentation, define Homeostasis and the components of a feedback loop (Sensor, Control Center, Effector). ● Checks for Understanding: Use 'Think-Pair-Share' where students identify a household appliance that maintains balance (e.g., an iron or a refrigerator). ● Social Learning: Small groups create a human 'Feedback	Instruction: Use a diagram to show the Hypothalamus as the body's 'Thermostat'. ● Scaffolding: Break down the process of Sweating (evaporative cooling) and Shivering (heat generation through friction). ● Checks for Understanding: Use 'Whiteboard Response' where students write 'Cold Response' or 'Hot Response' to different scenarios (e.g., 'Blood vessels dilate'). ● Social Learning: Group activity: 'The Mt. Pulag Survival Guide' - Students list how the body reacts to the extreme cold of Benguet versus the	Instruction: Present a visual model of the Pancreas acting as a sugar sensor. Explain the 'Lock and Key' mechanism of insulin. ● Scaffolding: Use a 'See-Saw' diagram to illustrate the balance between Glucose and Insulin. ● Checks for Understanding: 'Signal Cards' - Green for Blood Pressure up, Red for Blood Pressure down in response to specific stimuli (e.g., running from a stray dog). ● Social Learning: Case Study Analysis: 'Lolo's Merienda' - Analyze how a grandfather's body handles a snack of 'Coke and Buko Pie'.	Investigation: Students conduct a 'Heart Rate Lab' - measuring pulse at rest vs. after 2 minutes of jumping jacks (checking Blood Pressure indicator). ● Scaffolding: Provide a data table for students to record and graph their results. ● Direct Instruction: Synthesize the 'Big Three' (Temp, Glucose, BP) into a 'Survival Web'. Discuss what happens during organ failure. ● Social Learning: 'The Emergency Room' simulation - Groups are given a patient scenario (e.g., heatstroke or low blood sugar) and must explain
--	---	--	--	--

	Chain' representing how a stimulus leads to a response.	heat of Manila.		which homeostatic mechanism failed and how to help.
Learning Resources:	• PowerPoint Presentation on Feedback Mechanisms • Illustrations of household appliances • Student Activity Sheets	• Diagram of the Hypothalamus and Skin layers • Video clip on Thermoregulation • Projector and Smart TV	• Manipulatives (Lock and Key models) • Glucose level charts • Printed Worksheets/ Case Studies	• Stopwatches or wall clocks • Activity sheets for data recording • Scenario cards for simulation
Opportunities for integration:	• Mathematics: Discussion of equilibrium and set points as numerical constants. • Values Education: Relating internal balance to 'Katiwasayan' (inner peace/harmony).	• Geography: Discussion of the Philippine climate and its impact on human physiology. • Health: Understanding the dangers of heatstroke (Hyperthermia) and hypothermia.	• MAPEH (Health): Discussion of lifestyle diseases like Diabetes and Hypertension. • Home Economics: Understanding the glycemic index of common Filipino staple foods.	• Physical Education: Proper warm-up and cool-down techniques to manage heart rate. • English: Writing a clear explanatory paragraph for the simulation.
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	• Integrated Check:	• Diagram Completion	• Concept Mapping:	• Data Analysis:

Assessment:	During the 'Feedback Chain' activity, the teacher observes if groups correctly sequence the Stimulus-Response steps. ● Exit Ticket: Students must write one sentence explaining why balance is necessary for survival.	: Students fill in a blank flowchart showing the negative feedback loop for an increase in body temperature. ● Peer Review: Groups check each other's 'Mt. Pulag' guides for accuracy in physiological responses.	Students create a map linking the Pancreas, Insulin, Liver, and Blood Glucose levels. ● Observation: Teacher monitors group discussions during the 'Lolo's Merienda' case study to check for misconceptions about sugar.	Review students' graphs from the Heart Rate Lab to ensure they understand the 'return to baseline' concept. ● Performance Task: Evaluation of the 'Emergency Room' simulation based on accuracy of the biological explanation.
--------------------	--	---	--	--

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 Task: Observe a family member after they eat a heavy meal. Write down three visible physical changes (e.g., sweating, feeling sleepy).	● Creative Task: Draw a comic strip featuring 'Homeo-Man', a superhero who uses sweating and shivering to stay safe in different Philippine provinces.	● Interview: Ask a family member if they monitor their blood pressure or sugar. Record the tools they use (e.g., sphygmomanometer) and bring the info to class.	● Advocacy: Create a poster for the school clinic titled 'Helping My Body Stay Balanced', listing three healthy habits that support homeostasis.
Reflections:	● Did the 'Batya' analogy help the visual	● How did the students respond to the local climate	● Did the learners make the connection between	● Were students able to successfully link their

	learners grasp the concept of feedback? • Are the learners with literacy barriers able to identify the three parts of the feedback loop?	examples? • Were students able to connect the physical sensation of sweating to the scientific concept of homeostasis?	their diet and their body's need for homeostasis? • Was the see-saw analogy effective for explaining hormonal regulation?	heart rate data to the concept of homeostasis? • Which groups struggled most with the synthesis, and how can I provide more scaffolds for the 'Survival Web' next time?
--	---	---	--	--