Strengthened Senior High School

DepED
DEPARTMENT OF EDUCATION

Learning Activity Sheets for General Science

CORE SUBJECT



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If you have feedback on the LAS, please accomplish this form, which may be accessed through the following link: **https://bit.ly/Feedback_LE_LAS_Core.**

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LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	1	**Date**	
Lesson Title/Topic:	**Chemical Reactions in Everyday Lives – Common Types of Chemical Reactions and Their Everyday Applications**		
Name		**Grade & Section**	

Directions: Read each task carefully. Record your observations, evidence, and explanations in this LAS. Do not mix or test household chemicals unless your teacher provides a specific, supervised procedure.

Activity 1: Reaction Detective: Chemical Reactions in Daily Life

Analyze a familiar household or personal care product, its label, or a teacher-provided everyday scenario. Identify a possible chemical reaction from the use or process and support your classification with observable evidence or reliable product information. Do not combine products or perform unsupervised reactions.

Instructions:

1. **Selection:**
   Choose one familiar household or personal care product for analysis only, such as:
   vinegar, baking soda, toothpaste, shampoo, or a household cleaner whose label can be examined safely. Do not mix products.
   Identify one everyday use or process associated with the selected product. If no reaction can be supported by evidence, state that clearly rather than forcing a reaction classification.

2. **Task:**
   A. Examine the product label or teacher-provided information and describe the selected everyday process.

B. **Guide Questions**

Answer the following:

1. What happens during the selected use or process? What evidence can you observe or obtain from the provided information?
   Response: _____
2. What type of chemical reaction is supported by the evidence? If the evidence is insufficient, explain why.
   Response: _____
3. Why is this process useful in daily life, and what safety or environmental consideration should be remembered?
   Response: _____

3. **Valuing**

Explain one benefit and one potential safety or environmental concern related to the product or process.
Response: _____

Response Checklist:
Your response should include the product or process, possible reaction type, evidence or explanation, one safety concern, and one environmental implication.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	1	**Date**	
Lesson Title/Topic:	**Chemical Reactions in Everyday Lives – Common Types of Chemical Reactions and Their Everyday Applications**		
Name		**Grade & Section**	

Directions: Plan your ChemVlog in the organizer provided. Observe only safe everyday activities; do not mix or heat household chemicals for the purpose of recording a reaction. Record a 3–5-minute vlog only after your plan is approved by your teacher.
Activity: ChemVlog

Use safe everyday examples to explain common chemical reactions and the evidence used to identify them. Your vlog must distinguish an observed change from a scientifically supported reaction classification.

Instructions:

Identify up to three safe everyday activities (for example, cooking or an observed cleaning process). Describe what happens, note observable evidence, and identify a reaction type only when the evidence supports it.

Video Creation
Create a 3–5-minute vlog that includes:

- Activity observed
- A safe demonstration, reenactment, diagram, or explanation of one selected example. Do not intentionally create flames, fumes, spills, or chemical mixtures for the video.
- Explanation of the type of chemical reaction observed
- Description of the visible signs that helped you identify the type of reaction

Safety measures:
Use only ordinary, teacher-approved examples. Do not mix cleaning products, use open flames, taste substances, or handle corrosive products for the vlog. Keep devices away from water and obtain permission before recording other people.

ChemVlog Planning Organizer

Activity/Process	Observable Evidence	Possible Reaction Type	Explanation/Safety Note

Rubric for Video Creation

Criteria	Highly Effective (4)	Developing / Meeting (3)	Emerging (2)	Ineffective (1)
Chemistry Accuracy & Content	All chemical concepts, terms, equations, and explanations are completely accurate. Complex ideas are translated correctly for a general audience.	Most concepts are accurate. Contains 1–2 minor scientific errors or misconceptions that do not derail the main message.	Contains several scientific errors or noticeably misuses chemistry terminology. Explanations are confusing.	Major scientific inaccuracies throughout. Demonstrates a fundamental misunderstanding of the topic.
Real-World Relevance & Connections	Clearly and creatively connects the chemistry concept to everyday life. Explains *why* the audience should care about vivid examples.	Connects the chemistry concept to everyday life, but the connection feels a bit forced, generic, or surface level.	Mentions a real-world application but fails to explain the actual chemistry connecting the concept to the example.	No real-world connection is made. The video reads like a dry textbook definition.
Engagement & Vlog Style	Highly engaging! Uses a natural, conversational tone. Uses visual hooks, humor, or strong storytelling to keep the audience watching.	Engaging and clear. Sounds enthusiastic but relies a bit too much on reading from a script rather than talking *to* the camera.	Delivery is flat or monotone. The vlog feels like a formal classroom presentation rather than a dynamic video.	Low energy, disengaged, or simply reading a screen word-for-word. Will easily lose audience attention.
Production Quality (Video & Audio)	Audio is crystal clear. Video is well lit and stable.	Audio and video are clear, with minor issues	Audio is difficult to hear in parts, or video is	Poor audio quality (whispering/muffled) or

Criteria	Highly Effective (4)	Developing / Meeting (3)	Emerging (2)	Ineffective (1)
	Smooth transitions. Any on-screen graphics, text, or B-roll perfectly support the chemistry lesson.	(e.g., occasional background noise or slight framing issues). Text/graphics are helpful.	blurry/shaky. Visual aids are distracting, cluttered, or poorly timed.	unwatchable video. No effort made to edit or frame the shots.
Safety & Digital Citizenship	*(If performing a demo)* Perfect lab safety shown (goggles, gloves, etc.). All digital assets (music, images) are properly credited/copyright-free.	Safety gear is worn, but missing one element, or credit for external media is provided but incomplete.	Major safety violation during a demonstration OR completely copied media/assets without any attribution.	Gross negligence of lab safety rules, or complete plagiarism of video/script elements.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	2	**Date**	
Lesson Title/Topic:	**Chemical Reactions in Everyday Lives – Chemical Equations in Biological and Environmental Processes**		
Name		**Grade & Section**	

Activity: Controlled Investigation of Photosynthesis and Respiration

Learning Competency: Use chemical equations to show biological and environmental processes such as photosynthesis and respiration;

Objectives: By the end of the activity, you should be able to:

- record evidence of carbon dioxide changes in controlled biological setups;
- write and interpret the chemical equations for photosynthesis and respiration;
- distinguish observations from conclusions; and
- follow safe laboratory procedures.

Materials

- teacher-provided aquatic plant material or equivalent plant setup
- diluted bromothymol blue (BTB) or another teacher-approved CO_2/pH indicator
- two clear containers labeled LIGHT and DARK for comparison
- aluminum foil or dark cover
- yeast, sugar solution, two test tubes, and balloons for the respiration comparison, if assigned
- dropper/pipette, timer, labels, and pen or pencil

Safety

Do not taste any material or solution. Do not blow into the indicator or use mouth pipetting. Handle the indicator only as instructed, keep containers labeled, and wash your hands after the activity. Use only teacher-provided plant material; do not collect wild organisms for this task.

Procedure

1. Label the photosynthesis containers LIGHT and DARK. Use equal volumes of the same prepared indicator and comparable plant material in both containers.
2. Record the starting color. Place LIGHT in bright, indirect light or under a teacher-approved light source. Wrap DARK with foil. Keep all other conditions as similar as possible.
3. After the assigned observation period, record any color change. BTB color is an indirect indicator of pH/CO_2 conditions; it is not a direct measurement of the rate of photosynthesis.

4. If assigned the respiration comparison, prepare equal yeast mixtures. Add sugar to the experimental tube and use the teacher-specified control. Secure balloons and record inflation or other evidence of CO_2 production. Balloon size is not a direct measure of ATP production.
5. Use the evidence to write the balanced equations for photosynthesis and aerobic respiration. State which observations support your interpretation and what the model cannot show.

Observation and Equation Organizer

Setup	Starting Observation	Final Observation	Evidence/ Interpretation	Relevant Chemical Equation
Plant – Light				
Plant – Dark				
Yeast – Experimental				
Control/Comparison				

Guide Questions

1. What evidence distinguishes the light and dark plant setups?
   Response:
   _____

2. How does the photosynthesis equation represent the biological process you investigated?
   Response:
   _____

3. What evidence of respiration or fermentation was observed in the yeast setup, if used?
   Response:
   _____

4. How are the photosynthesis and respiration equations related in terms of reactants and products?
   Response:
   _____

5. What limitation of the indicator or model should be considered when interpreting the results?
   Response:
   _____

Rubric for Lab Report

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)
Scientific Accuracy	Clear, correct, detailed	Mostly correct	Some errors	Major errors
Observation & Recording	Detailed, precise	Adequate	Minimal	Incomplete
Explanation of Processes	Strong links to photosynthesis/respiration	Partial links	Weak links	No links
Collaboration	Active teamwork	Moderate teamwork	Limited teamwork	Minimal teamwork
Presentation	Clear, logical	Adequate	Some gaps	Disorganized

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	3	**Date**	
Lesson Title/Topic:	**Chemical Reactions in Everyday Lives – Metabolism: Chemical Reactions in Body Cells**		
Name		**Grade & Section**	

Option 1: What's Happening in Their Body? A Case Study

I. LEARNING COMPETENCY

Describe the chemical reactions that take place in body cells, collectively referred to as metabolism, and explain their significance.

II. LEARNING OBJECTIVES

- After completing this Learning Activity Sheet, you should be able to:
- Define metabolism.
- Differentiate anabolic and catabolic reactions.
- Identify nutrients as reactants in metabolic processes.
- Explain how lifestyle habits affect metabolism.
- Recommend healthy practices that support metabolic health.

III. BRIEF DISCUSSION

Every day, our bodies perform countless activities such as walking, studying, exercising, growing, and repairing damaged tissues. These activities require energy. The energy we use comes from the food we eat.

The chemical reactions that occur within living cells to sustain life are collectively called metabolism. Metabolism allows the body to convert nutrients from food into usable energy and materials needed for growth, repair, and maintenance of body functions.

Metabolism consists of two major types of reactions:

Anabolic Reactions

These reactions build complex molecules from simpler substances. They require energy.

Examples:

- Muscle growth
- Protein synthesis
- Tissue repair

- Bone formation
- Catabolic Reactions

These reactions break down complex molecules into simpler substances and release energy.

Examples:
- Digestion of food
- Breakdown of fats
- Cellular respiration
- Breakdown of glycogen into glucose

Nutrients such as carbohydrates, proteins, and fats serve as reactants in metabolic processes. One important product of metabolism is ATP (Adenosine Triphosphate), which serves as the primary source of energy for cellular activities.

Healthy lifestyle habits such as proper nutrition, regular physical activity, adequate sleep, and sufficient water intake help maintain a healthy metabolism.

IV. LEARNING ACTIVITY

What's Happening in Their Body?
Directions: Read the case study carefully and answer the questions that follow.

Case Study:
Liam and Jordan are both 17-year-old Grade 11 students.
Liam generally eats regular, varied meals, exercises, gets adequate sleep, and drinks enough water. These habits can support normal energy availability and metabolic processes, although energy levels and body composition are influenced by many biological and environmental factors.

Jordan frequently skips meals, consumes many sugary drinks and processed foods, sleeps late, and rarely engages in physical activity. He often reports tiredness and difficulty concentrating. These symptoms can have many causes; when food intake is low, the body can draw on stored fuels while continuing the metabolic reactions needed for cellular function.

Part A. Understanding the Situation
Answer the following questions.

What differences can you identify between Liam's and Jordan's lifestyles?

_____
_____
_____

Which student demonstrates healthier lifestyle habits? Why?

_____
_____
_____

How do Liam's habits help support his body's metabolism?

_____
_____

Why does Jordan frequently experience fatigue and difficulty concentrating?

_____
_____
_____
_____

Part B. Metabolism in Action

Complete the table below.

Situation	Anabolic or Catabolic?	Explain Your Answer
Muscle growth after exercise	_____	_____
Digestion of food	_____	_____
Tissue repair after an injury	_____	_____
Breakdown of fats for energy	_____	_____

Part C. Nutrients as Reactants

Directions: Identify the nutrient most closely associated with each situation.
Write:
C – Carbohydrates
P – Proteins
F – Fats

_____ 1. Primary source of immediate energy
_____ 2. Needed for growth and tissue repair
_____ 3. Long-term energy storage
_____ 4. Used by muscles during physical activity
_____ 5. Important in building body tissues

Part D. Analysis and Application

Answer the following questions.

What nutrients are likely being used by Liam's body to support his daily activities?

_____
_____

What nutrients may be broken down in Jordan's body when he skips meals?

_____
_____

Why is metabolism important for growth, repair, movement, and other life processes?

_____
_____
_____

How can poor lifestyle habits negatively affect metabolism?

_____
_____
_____
_____

Part E. Health Recommendation

Imagine that you are a health adviser.
Provide THREE recommendations that can help Jordan improve his metabolic health.

Recommendation How It Helps Metabolism

1.
2.
3.

V. GENERALIZATION

Complete the concept map below.

METABOLISM

Metabolism is the set of _____
that occur in _____.
It involves:

ANABOLIC REACTIONS

(Building Up)

Example:

_____

and

CATABOLIC REACTIONS

(Breaking Down)

Example:

_____

Reactants:

_____

Products:

_____

Importance:

_____
_____

VI. ASSESSMENT

Directions: Read each question carefully and choose the letter of the best answer.

1. During a long-distance run, Carla's body breaks down stored glucose to provide energy for her muscles. Which metabolic process is primarily occurring?
   A. Anabolism
   B. Catabolism
   C. Diffusion
   D. Osmosis
2. After several weeks of strength training and proper nutrition, Joshua develops stronger muscles. Which metabolic process is mainly responsible for this change?
   A. Digestion
   B. Catabolism
   C. Anabolism
   D. Excretion
3. Why is ATP important in living organisms?
   A. It stores genetic information.
   B. It transports nutrients throughout the body.
   C. It provides usable energy for cellular activities.
   D. It protects the body from disease.
4. Which nutrient is most used by the body as its primary source of immediate energy?
   A. Vitamins
   B. Proteins
   C. Fats
   D. Carbohydrates
5. Which statement best explains the importance of metabolism?
   A. It only helps digest food.
   B. It supports energy production, growth, repair, and other life processes.
   C. It only occurs during physical activity.
   D. It only happens in the digestive system.

VII. REFLECTION

Answer the question below in 3–5 sentences.

Which healthy habit do you think will have the greatest positive effect on your metabolism? Explain your answer.

_____
_____
_____
_____
_____
_____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	4	**Date**	
Lesson Title/Topic:	**Solutions in the Environment – Characteristics and Applications of Solutions**		
Name		**Grade & Section**	

MATCHING TYPE ACTIVITY:
Directions: Read each description in **Column A** carefully. Choose the correct scientific term from **Column B** that best matches each description. Write the **letter and term** of your answer in the space provided in the given table.

Column A - Description	Write your answer here	Column B - Term
1. Able to dissolve in a solvent.		A. Soluble
2. The substance that is dissolved in a solution.		B. Solute
3. The substance that dissolves the solute.		C. Dissolution
4. A homogeneous mixture of solute and solvent.		D. Solvent
5. A mixture where particles are temporarily dispersed but settle over time.		E. Homogeneous

Column A - Description	Write your answer here	Column B - Term
6. A material with a consistent composition, either an element or a compound.		F. Mixture
7. A combination of two or more substances that are not chemically bonded.		G. Pure substance
8. Refers to the texture of a mixture with uniform composition throughout.		H. Heterogeneous
9. Refers to the texture of a mixture with clearly distinguishable components.		I. Solution
10. The process of dissolving a solute in a solvent.		J. Colloid
11. A mixture in which particles are temporarily dispersed but settle over time.		K. Suspension

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	4	**Date**	
Lesson Title/Topic:	**Solutions in the Environment – Characteristics and Applications of Solutions**		
Name		**Grade & Section**	

MY SOLUTION ANALYSIS ACTIVITY:

Directions: Analyze each mixture listed in the table below. Determine whether it is a solution or non-solution, identify the solute and solvent when applicable, state the characteristic that supports your answer, and give an appropriate use or context.

Mixture	**Solution or Non-Solution?**	**Solute**	**Solvent**	**Characteristic Supporting Answer**	**Example of Use / Context**
Salt water					
Sugar dissolved in water					
Vinegar					
Soft drink					
Oil and water					
Sand and water					
Air					
Seawater					

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	5	**Date**	
Lesson Title/Topic:	**Solutions in the Environment – Safe Handling, Storage, and Disposal of Chemicals**		
Name		**Grade & Section**	

Activity: Part I. Safety First or Safety Risk?
Directions: Read each statement carefully. Write **Safety First** if the practice promotes proper handling, storage, or disposal of chemicals. Write **Safety Risk** if the practice may cause harm to people or the environment.

1. Keeping bleach in its original labeled container. _____
2. Throwing used batteries in a regular trash bin. _____
3. Reading the product label before using a chemical. _____
4. Storing insecticides within the reach of children. _____
5. Disposing of expired medicines according to local guidelines. _____
6. Mixing cleaning chemicals without reading instructions. _____
7. Wearing gloves when handling corrosive substances. _____
8. Keeping chemicals away from food and drinks. _____
9. Pouring used paint into a drainage canal. _____
10. Following the safety precautions indicated on product labels. _____

Part II. What Should You Do?
Directions: Read each situation carefully. Choose the best action that demonstrates proper chemical handling, storage, or disposal. Circle the letter of the correct answer.

1. You found an expired bottle of medicine at home. What should you do?
   A. Throw it into a river
   B. Follow proper disposal guidelines
   C. Leave it on a table
   D. Store in cabinet

2. Before using a household cleaner, you should:
   A. Read the label and safety instructions
   B. Mix it with another cleaner
   C. Remove the label
   D. Use it immediately

3. Where should insecticides be stored?
   A. Near food items
   B. Within reach of children
   C. In a secure place away from children and pets
   D. Within the reach of everyone

4. What is the best way to dispose of used batteries?
   A. Place them in a designated collection or recycling center
   B. Throw them in any trash bin
   C. Burn them
   D. Store in plastics

5. Why is it important to label chemical containers properly?
   A. To identify hazards and safety precautions
   B. To make containers look attractive
   C. To save storage space
   D. To save time

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	6	**Date**	
Lesson Title/Topic:	**Solutions in the Environment – Effects of Salt Concentration on Plant Growth**		
Name		**Grade & Section**	

Activity No. 1: Salt Trials: Hypothesize, Experiment, Grow!

Objectives:
By the end of the activity, you should be able to:

- formulate a testable hypothesis on how varying salt concentrations affect mung bean growth;
- conduct a controlled salinity experiment using standardized conditions and three replicates per treatment;
- collect and summarize daily data on plant height, number of leaves, leaf color/health, and germination;
- graph plant-growth trends and identify the salt level where growth declines; and
- recommend practical strategies for managing saline conditions in agricultural settings.

Materials Needed:

Material	Suggested Quantity	Notes
Mung bean seeds	At least 75	Five seeds per pot × 15 pots
Small pots/cups	15	Five treatments × three replicates
Soil/cotton medium	Equal amount per pot	Same medium for all groups
NaCl	As needed	0.25 g/0.50 g/1.00 g/2.00 g per 100 mL water
Tap or distilled water	As needed	Use the same water source for all treatments
Beakers/containers	At least 5	Labeled solutions
Scale, measuring cup, ruler, labels	1 set	Measurement and documentation
Gloves/waste container	As available	Safety and cleanup

Safety Reminders:

- Do not taste or drink any salt solution, plant material, or soil/cotton medium used in the activity.
- Wash hands before and after handling seeds, soil/cotton, saltwater, and containers.
- Wear gloves if available, especially when handling soil, used solutions, or plants after treatment.
- Measure NaCl carefully using the digital scale; keep containers properly labeled to avoid mixing treatments.
- Clean spills immediately to prevent slipping and to avoid accidental contamination of other treatments.
- Use separate cups/droppers for each treatment to avoid cross-contamination.
- Dispose of used saltwater and plant materials as directed by the teacher; do not pour large amounts of saltwater onto garden soil.
- Use cameras/smartphones only with dry hands and keep devices away from water containers.

Concept Primer: Salt in soil water can cause osmotic stress. High salt outside roots makes water less available to plant cells, reducing water uptake, nutrient movement, germination, and growth.

Instructions:

1. Work in groups using five salt treatments with three replicates per treatment: 0% NaCl (control), 0.25% NaCl, 0.50% NaCl, 1.00% NaCl, and 2.00% NaCl. Use the same water source for all treatments so salt concentration is the only intended treatment difference.
2. Identify variables before starting. Independent variable: salt concentration/treatment. Dependent variables: plant height, number of leaves, leaf color/health, and germination. Controlled variables: seed number, planting depth, pot size, medium, light, water volume, observation time, and temperature.
3. Write a hypothesis predicting how increasing salt concentration will affect mung bean growth.

Hypothesis:

Experimental Design: Show treatments, three replicates, controlled variables, and exact material amounts.

4. Prepare solutions using percent mass/volume (% m/v): 0% = no added NaCl; 0.25% = 0.25 g NaCl/100 mL water; 0.50% = 0.50 g/100 mL; 1.00% = 1.00 g/100 mL; and 2.00% = 2.00 g/100 mL.
5. Plant five mung bean seeds per pot at about 1 cm depth, equally spaced, using the same pot size and equal medium amount.
6. Arrange pots in a well-lit area. Randomize or rotate pot positions daily to reduce light bias.
7. Water each pot with 10 mL of its designated solution at the same time daily. Avoid cross-contamination.
8. Record height, leaves, germination, leaf color/health rating, and notes daily for seven days.
9. Compute means: Mean = (Replicate 1 + Replicate 2 + Replicate 3) / 3.
10. Create line graphs for mean height and mean leaves. Include title, axis labels, units, and legend.
11. Identify the growth-decline threshold as the lowest salt concentration where mean height or leaf count is at least 20% lower than the control by Day 7, or justify another evidence-based rule.

Table 1. Daily Mean Plant Height (cm)

Treatment Group	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0% NaCl (control)							
0.25% NaCl							
0.50% NaCl							
1.00% NaCl							
2.00% NaCl							

Table 2. Daily Mean Number of Leaves

Treatment Group	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
0% NaCl (control)							
0.25% NaCl							
0.50% NaCl							
1.00% NaCl							
2.00% NaCl							

Table 3. Leaf Color/Health Rating and Notes

Treatment Group	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Notes
0% NaCl (control)								
0.25% NaCl								
0.50% NaCl								
1.00% NaCl								
2.00% NaCl								

Leaf Color/Health Rating Scale: 1 = green/healthy; 2 = pale green; 3 = yellowing; 4 = brown/wilted; 5 = dead/no visible growth**.**

Conclusion and Recommendations:

Synthesis:

1. What are the independent, dependent, and controlled variables? Why are controls essential?

2. How do plant height and number of leaves change with increasing salt concentration? Use at least two numerical values.

3. What changes in leaf color and health are observed, and what do they indicate?

4. How might osmotic stress affect mung bean water and nutrient uptake?

5. Based on your data, identify the salt concentration threshold at which growth significantly declines and justify your reasoning.

6. What improvements could be made if this experiment were repeated?

7. How can the findings be applied to agricultural practices in saline-prone regions?

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	7	**Date**	
Lesson Title/Topic:	**Solutions in the Environment – Effects of Saltwater and Wastewater on Local Ecosystems**		
Name		**Grade & Section**	

Activity No. 1: Eco Experiment

Objectives:
By the end of the activity, you should be able to:

- compare plant-growth and soil-pH data across control, saltwater, and simulated wastewater treatments;
- measure plant height, leaf count, leaf color/health, and soil pH using standardized procedures;
- interpret trends and relate them to local ecological problems;
- propose evidence-based mitigation strategies; and
- create a simple community awareness output based on findings.

Materials Needed:

Material	Suggested Quantity	Notes
Fast-growing seedlings	27 seedlings	Three treatments × three replicates × three seedlings
Small pots/trays	9	Three treatments × three replicates
Soil	Equal volume per pot	Same type and amount
Tap water	At least 500 mL	Control
NaCl	15 g/500 mL or 3 g/100 mL	3% saltwater
Mild detergent	1 mL/100 mL water	Simulated wastewater
pH strips, ruler, scale, labels	1 set	Measurement
Gloves, tray, waste container	As available	Safety/disposal

Safety Reminders:

- Do not taste or drink any treatment solution, soil, plant material, or liquid used during the activity.
- Handle detergent or any household chemical only under teacher supervision. Do not mix unknown household chemicals.
- Wear gloves if available and avoid contact with the detergent solution in the eyes, mouth, or on broken skin.
- Wash hands after handling soil, seedlings, pH strips, saltwater, detergent solution, or used containers.
- Label all containers clearly as T1 Control, T2 3% Saltwater, or T3 Simulated Wastewater.
- Use separate cups/droppers for each treatment to avoid cross-contamination.
- Clean spills immediately and keep water/solutions away from phones and electrical outlets.
- Use pH strips carefully; do not place used strips back into clean containers.
- Dispose of used saltwater, detergent solution, soil, and plant materials as directed by the teacher. Do not pour concentrated saltwater or detergent solution onto garden soil or waterways.

Important Treatment Note: Use one class-wide simulated wastewater recipe. Detergent and vinegar should not be interchanged unless treated as separate experimental treatments.

Instructions:

1. Divide the class into groups. Each group will test three treatments with at least three replicates: T1 Control, T2 3% Saltwater, and T3 Simulated Wastewater.
2. Use pre-grown seedlings of similar height and age. If seeds are used, begin treatment only after germination when seedlings are comparable.
3. Identify the variables before starting. Independent variable: treatment type. Dependent variables: plant height, number of leaves, leaf color, leaf health, and soil pH. Controlled variables: seedling age/size, pot size, soil amount/type, planting depth, light, temperature, watering volume, and observation time.
4. Write a hypothesis predicting how the treatments will affect plant growth, appearance, and soil pH.

Hypothesis:

Experimental Design: Show each treatment, three replicates, controlled variables, and exact material amounts.

5. Prepare and label solutions: T1 Control = tap water only; T2 3% Saltwater = 3 g NaCl/100 mL water or 15 g/500 mL; T3 Simulated Wastewater = 1 mL mild detergent/100 mL water.
6. Fill the pots with equal volumes of soil. Place seedlings at uniform depth/spacing. Label the pots as T1R1, T1R2, and so on.
7. Measure baseline plant height, number of leaves, leaf color, leaf health rating, and soil pH before treatment.
8. Place pots on a flat, well-lit surface. Randomize or rotate positions daily.
9. Water each pot with 10 mL of its assigned solution once daily at the same time; avoid contamination.
10. Record daily data for seven days. Measure soil pH before treatment and on Days 3, 5, and 7, or at minimum before and after the treatment.
11. Create graphs showing final mean plant height, mean number of leaves, and change in soil pH for each treatment.
12. Relate results to local issues such as saltwater intrusion, improper drainage, detergent-rich wastewater, or river/estuary pollution.
13. Propose mitigation strategies and explain the value of community awareness.

Table 1. Daily Observation Log (Plant Height, cm)

Treatment/Replicate	Baseline	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
T1 Control R1								
T1 Control R2								
T1 Control R3								
T2 3% Saltwater R1								
T2 3% Saltwater R2								
T2 3% Saltwater R3								
T3 Simulated Wastewater R1								
T3 Simulated Wastewater R2								
T3 Simulated Wastewater R3								

Table 2. Daily Observation Log (Number of Leaves)

Treatment/Replicate	Baseline	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
T1 Control R1								
T1 Control R2								
T1 Control R3								
T2 3% Saltwater R1								
T2 3% Saltwater R2								
T2 3% Saltwater R3								
T3 Simulated Wastewater R1								
T3 Simulated Wastewater R2								
T3 Simulated Wastewater R3								

Table 3. Daily Observation Log (Leaf Rating)

Treatment/Replicate	Baseline	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
T1 Control R1								
T1 Control R2								
T1 Control R3								
T2 3% Saltwater R1								
T2 3% Saltwater R2								
T2 3% Saltwater R3								
T3 Simulated Wastewater R1								
T3 Simulated Wastewater R2								
T3 Simulated Wastewater R3								

Leaf Color/Health Rating Scale: 1 = green/healthy; 2 = pale green; 3 = yellowing; 4 = brown/wilted; 5 = dead/no visible growth.

Table 4. Daily Observation Log (Soil pH)

Treatment/Replicate	Baseline	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
T1 Control R1								
T1 Control R2								
T1 Control R3								
T2 3% Saltwater R1								
T2 3% Saltwater R2								
T2 3% Saltwater R3								
T3 Simulated Wastewater R1								
T3 Simulated Wastewater R2								
T3 Simulated Wastewater R3								

Table 5. Final Plant Results by Replicate

Treatment Group	Replicate	Final Height (cm)	Final No. of Leaves	Leaf Rating	Final Soil pH	Observations
T1 Control	R1					
T1 Control	R2					
T1 Control	R3					
T2 3% Saltwater	R1					
T2 3% Saltwater	R2					
T2 3% Saltwater	R3					
T3 Simulated Wastewater	R1					
T3 Simulated Wastewater	R2					
T3 Simulated Wastewater	R3					

Table 6. Comparative Analysis of Mean Results

Treatment Group	Mean Final Height (cm)	Mean Final Leaves	General Leaf Condition	Mean Final Soil pH
T1 Control				
T2 3% Saltwater				
T3 Simulated Wastewater				

Mean = (Replicate 1 + Replicate 2 + Replicate 3) / 3

Conclusion and Recommendations:

VI. Synthesis:

1. What are the independent, dependent, and controlled variables?

2. How do plant height, number of leaves, and soil pH vary among the treatments? Cite at least two values.

3. What trends can be observed in leaf color and plant health? Cite evidence.

4. Propose ways to reduce the impacts of saltwater intrusion and improper wastewater disposal. Classify each strategy as prevention, monitoring, treatment, or community action.

5. How can community awareness and collective action protect local ecosystems?

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	8	**Date**	
Lesson Title/Topic:	**Unifying Themes of Life Science – Living Organisms as Systems of Interrelated Parts**		
Name		**Grade & Section**	

Activity: Differentiated System Identification and Analysis
Directions: Complete the task assigned for your readiness level. Record your labels, explanations, and analysis in the spaces provided in this LAS, then submit the required output as instructed.

Level 1: Foundational (Guided Identification)
Instructions:
1. Look at the picture presented by your teacher
2. Identify the system.
3. Label the main parts.
4. State its function.

System: _____

Main Parts:
- _____
- _____
- _____
- _____

Function:
_____
_____
_____

Level 2: Developing (Explaining Interactions)
Instructions:
1. Observe carefully the materials (images, diagrams or videos) given by your teacher.
2. Identify the parts.
3. Explain interactions between parts.
4. Explain how these interactions sustain life.

System: _____

Components:

- _____
- _____
- _____
- _____
- _____

How the parts work together:

_____
_____
_____

Life-sustaining role:

_____
_____
_____

Level 3: Proficient (Analyzing System Function from Media)

Instructions:

1. Watch the video or image sequence shown by your teacher.
2. Identify the processes occurring.
3. Explain interactions and outcomes.
4. Predict what happens if a part fails.

Processes observed:

- _____
- _____
- _____
- _____

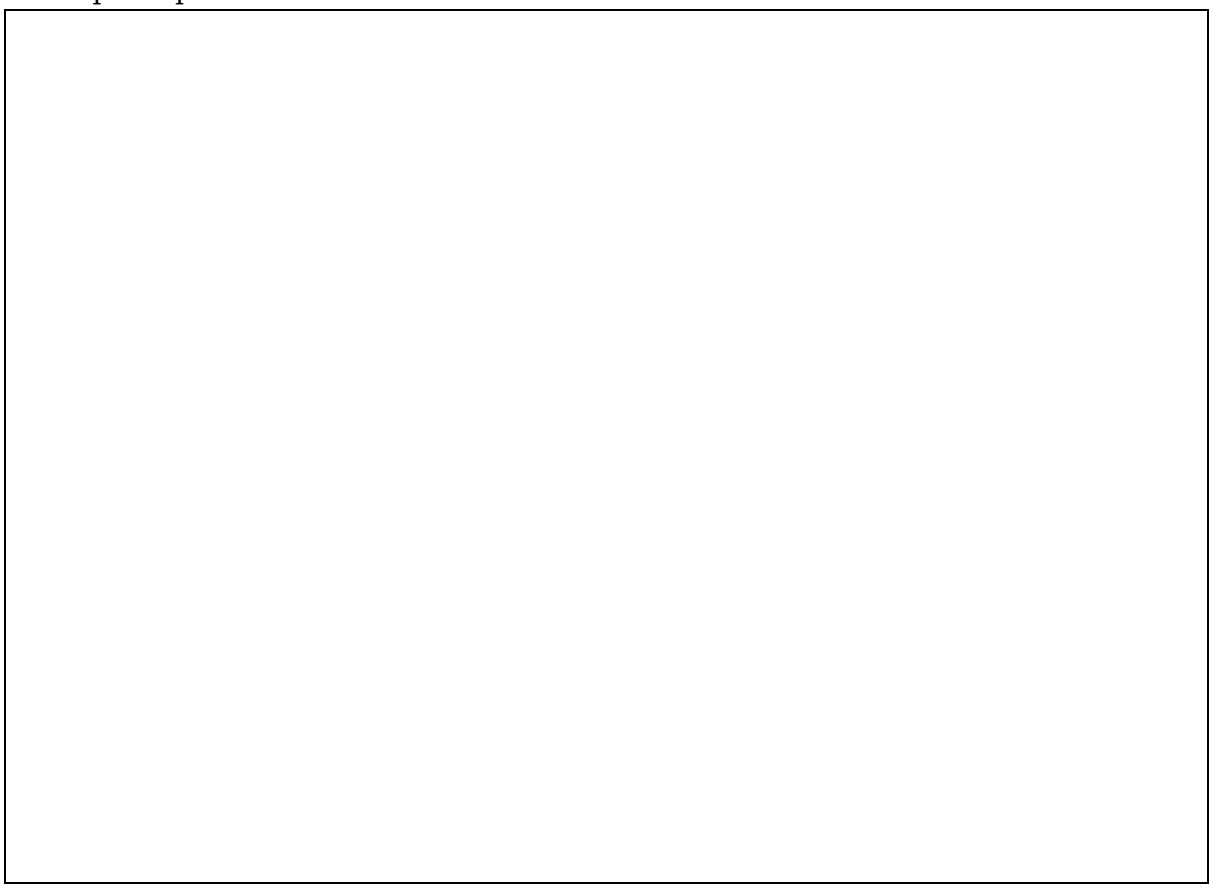
Interactions and outcomes:

_____
_____
_____
_____

If one part fails:

_____
_____
_____

Concept Map Sketch Area:



LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	9	**Date**	
Lesson Title/Topic:	**Unifying Themes of Life Science – Structure and Function in Biological Systems**		
Name		**Grade & Section**	

Directions: Read and follow the procedure carefully. Prepare the materials, record your hypothesis and observations in this LAS, and present the completed model as instructed.

Activity: Inside-Out: Modeling a Living System

Overview:
You will create a 3D model or interactive diagram of a selected biological system and prepare a brief oral presentation and a function map that explain how each component contributes to the system's overall function.

Materials Needed

- Recyclable materials (boxes, tubes, paper, string, etc.) or digital tools (e.g., Canva, Google Slides)
- Manila paper or poster board
- Markers, glue, and scissors
- Optional: Tablets or laptops for digital diagrams

Procedures

System Selection & Research

a. Select one biological system.
b. Research and list its key components: cells, tissues, organ, and the overall system.
c. Identify each part's function and how it supports the system.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	9	**Date**	
Lesson Title/Topic:	**Unifying Themes of Life Science – Structure and Function in Biological Systems**		
Name		**Grade & Section**	

Directions: Read and follow the procedure carefully. Record your hypothesis, observations, and answers in this LAS. Build and present the model only as instructed by your teacher.

Activity: "Design a Bio-Pump" (The Structure-Function Challenge)

You will apply your understanding of biological levels of organization by designing and building a functional physical model of a heart chamber to see how physical structure directly determines pumping function.

Materials Needed

- 1 plastic cup or small plastic bottle (acts as the heart chamber)
- 2 balloons (one to act as the muscle, one for backup)
- 2 flexible plastic drinking straws (act as blood vessels)
- Tape (masking or duct tape)
- Scissors
- A tray or large bowl (to catch spills)
- Water colored with red food dye (represents blood)

Step-by-Step Instructions

Step 1:
Before touching the materials, look at the Organ Level of the diagram, then write down a one-sentence hypothesis predicting how changing a structure (e.g., the width of the straw or vessel) will affect the function (how fast or how far the water is pumped).

Step 2: Building the Model

1. Fill the plastic cup about halfway with the red water. Place the cup inside the tray.
2. Cut the neck off one balloon. Stretch the wide part of the balloon tightly over the top of the cup to create a flat, rubbery "lid." Secure it tightly with tape around the rim.
3. Carefully poke two small, separate holes through the balloon lid using scissors.
4. Push one straw through each hole so that they extend into the water. These represent the heart's structural entry and exit vessels.

Optional challenge: Use a tiny piece of tape or a finger to act as a "valve" on one straw and observe whether the water can be made to move in only one direction when the balloon lid is pressed.

Step 3: Testing the Function Gently press the rubber balloon lid up and down to mimic the contraction of cardiac muscle tissue.

Observe how the water behaves. Does it shoot out of both straws? Does it create a vacuum?

Structure Modification: Apply the standardized partial outflow resistance specified by your teacher, then repeat the same pressing motion. Record the before-and-after observations. This simplified model demonstrates a structure–function relationship; it does not reproduce a specific blocked artery, closed valve, or high-blood-pressure diagnosis.

Wrap-Up & Discussion Questions

Present your model and answer the following questions to relate your observations to the hierarchical diagram:

Cellular to Tissue Level:

1. What did the rubber balloon lid represent? How did its elasticity (a structural trait) allow it to perform its function (a functional trait)?

   _____

   _____

Organ Level:

2. What changed after the standardized outflow resistance was applied? Explain the structure–function relationship without treating the model as a diagnosis of a specific heart condition.

   _____

   _____

Organism Level:

3. If the heart cannot pump blood effectively, how could reduced oxygen transport affect the rest of an organism?

   _____

   _____

Relationship prompts:

How does each part help the whole system work? What happens to the system if this part is damaged or removed?

_____

_____

Rubric: "Design a Bio-Pump"

Criteria	Highly Effective (4)	Meeting Standards (3)	Emerging (2)	Ineffective (1)
Structure–Function Accuracy	Accurately explains what each major model part represents and how structure affects function, including model limitations.	Explains most parts and the relationship accurately, with one minor omission.	Identifies some parts but gives a limited or partly inaccurate explanation.	Shows little understanding of the model parts or structure–function relationship.
Model and Procedure	Constructs the model safely, follows the standardized procedure, and produces a consistent before/after comparison.	Model functions and procedure are followed with minor issues.	Model partly functions or several procedure details require correction.	Model is unsafe, incomplete, or cannot support the required comparison.
Observation and Evidence	Records clear before/after observations and uses them appropriately as evidence without overclaiming.	Records relevant observations and gives a generally appropriate interpretation.	Records limited observations or makes a weak evidence–explanation connection.	Provides little usable evidence or makes unsupported claims.
Communication and Scientific Reasoning	Presents clearly, uses accurate biological terms, and answers all guide questions with evidence.	Presents clearly and answers most questions accurately using appropriate terms.	Presentation or answers contain important gaps or terminology issues.	Presentation is incomplete or shows major scientific misunderstanding.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	10	**Date**	
Lesson Title/Topic:	**The Importance of Cells in Living Things – Cellular Nutrition and Energy Conversion**		
Name		**Grade & Section**	

Objective(s): By the end of the activity, you should be able to:

- Use starch-test evidence from a controlled leaf comparison to support an interpretation about photosynthesis.
- Observe carbon-dioxide production by yeast in a sugar solution as evidence of a cellular process under the test conditions.
- Record and analyze experimental results to explain energy transformation in cells.
- Collaborate in groups to compare plant and animal cellular processes.

Materials

- **Option A (Plants):** teacher-prepared exposed/covered leaf sample, iodine solution, dropper, beaker, and hot-water bath. Ethanol, when required for decolorization, is handled by the teacher only.
- **Option B (Respiration):** Yeast, sugar solution, test tubes, balloons, rubber bands.

Directions

1. **Introduction**
   - Setup
   - Review the purpose of the assigned experiment and the safety instructions with your teacher.
   - Photosynthesis produces starch in leaves
   - Yeast respiration releases CO_2 as energy is transformed

2. **Group Division**
   - Work in your assigned group and complete Option A or Option B as directed.
   - Assign roles (recorder, handler, observer, presenter)
   - Ensure balanced participation

3. **Conduct the Plant Starch Test**
   - Discuss the laboratory safety notes
   - Always wear protective gear (gloves, goggles, lab coat).
   - Handle hot water baths carefully to avoid burns.
   - Do not handle ethanol unless instructed. The teacher conducts any ethanol step away from flames or ignition sources.
   - Dispose of used plant material and yeast solutions properly.

- Wash hands thoroughly after the experiment.
- Follow the demonstrated procedure before beginning your assigned steps.
- For Option A, compare the iodine-staining pattern of an exposed leaf area with the covered control area after teacher-supervised preparation.
- Follow the teacher-demonstrated leaf preparation procedure. Do not handle hot water or ethanol unless specifically instructed.
- The teacher handles any ethanol decolorization step in a hot-water bath with all flames and ignition sources absent.
- Rinse and apply iodine solution
- Observe blue-black color change

4. Conduct the Yeast Respiration Test

- Ensure safety during the activity
- For Option B, prepare the assigned yeast–sugar setup and control, then observe balloon inflation or other evidence of CO_2 production.
- Prepare the assigned yeast–sugar mixture and control using equal volumes as directed.
- Seal with balloons using rubber bands
- Observe balloon inflation as CO_2 is produced

5. Record Observations

- Record the procedure, observations, results, and conclusion in this LAS or your laboratory record as instructed.
- Write a detailed procedure
- Note color changes or balloon inflation
- Summarize the findings

6. Discussion and Reporting

- Use the recorded evidence to connect the starch test to the controlled photosynthesis comparison and yeast CO_2 production to fermentation/ respiration under the test conditions.
- Connect starch presence to photosynthesis
- Connect CO_2 release to respiration
- Present or submit your group's laboratory report as instructed.

Observation Organizer

Option/Setup	Observation	Comparison/Control	Evidence-Based Interpretation
Plant starch test			
Yeast-sugar setup			
Control/comparison			

Guiding Questions

1. What difference in iodine staining was observed between the exposed and covered leaf areas, and how does that evidence relate to photosynthesis?
2. How does balloon inflation provide evidence of CO_2 production by yeast? What can it not tell you directly about cellular ATP production?
3. What similarities exist between plant and animal energy transformation?
4. How do these experiments connect to everyday life (e.g., food energy, exercise)?
5. What safety measures are most important in these experiments?

Rubric for Lab Report

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)
Scientific Accuracy	Clear, correct, detailed	Mostly correct	Some errors	Major errors
Observation & Recording	Detailed, precise	Adequate	Minimal	Incomplete
Explanation of Processes	Strong links to photosynthesis / respiration	Partial links	Weak links	No links
Collaboration	Active teamwork	Moderate teamwork	Limited teamwork	Minimal teamwork
Presentation	Clear, logical	Adequate	Some gaps	Disorganized

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	11	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – Transport of Materials in Plants**		
Name		**Grade & Section**	

Activity: Plant Transport System: Organ Interaction Map

Part A. Create your Organ Interaction Map.
Directions: In the diagram space provided, draw a neat, detailed diagram of a plant transport system. Your map must explicitly include and label the following requirements:

1. **The Three Major Organs:** Draw the **Roots**, **Stem**, and **Leaves**.
2. **The Vascular Tissues:** Illustrate where the **Xylem** and **Phloem** are located within *each* of those three organs.
3. **Directional Flow (Color-Coded Arrows):**
   - Use **blue arrows** to show the movement of water and dissolved minerals through the xylem.
   - Use **red arrows** to show the movement of manufactured food (sugar/sucrose) through the phloem.
4. **Short Annotations:** Write a brief, 1- to 2-sentence note next to each organ explaining its specific contribution to the plant's overall transport process.

1. Leaves	Short Annotation

1. Leaves	Short Annotation
2. Stem	Short Annotation
3. Roots	Short Annotation

Part B. Processing Questions

Directions: Answer the following questions in complete sentences based on your diagram and understanding of organismal systems.

1. How do the roots, stem, and leaves coordinate to ensure continuous transport of water and nutrients throughout the plant?

   Answer:_____
   _____
   _____
   _____
   _____

2. How does the interaction among these organs reflect the idea of the plant as a unified system rather than just separate, independent parts?

   Answer:_____
   _____
   _____
   _____
   _____

Scoring Guide:

Criteria	4 pts	3 pts	2 pts	1 pt
Anatomical Components Label	All 3 organs (roots, stem, leaves) and both vascular tissues (xylem, phloem) are perfectly identified in all regions.	All major organs are labeled; 1 vascular tissue label is missing or misplaced.	Missing multiple organ or tissue labels; structure is incomplete.	Labels are missing entirely or completely inaccurate.
Directional Flow and Color Coding	Clear, distinct color-coded arrows accurately show unidirectional upward water flow and bidirectional food distribution.	Arrows are present and mostly accurate, but color-coding is inconsistent or missing a clear legend.	Arrow directions are incorrect (e.g., showing water moving downwards from leaves), confusing the transport mechanism	No arrows or directional flow indicators are present.

Criteria	4 pts	3 pts	2 pts	1 pt
Quality of Annotations	All three organs have highly accurate, concise descriptions detailing their functional contributions to transport.	Annotations are present for all organs but are slightly vague or copy directly from basic definitions.	Only one or two organs are annotated, or the notes contain scientific inaccuracies.	No annotations are written on the map.
Analysis and System Thinking	Processing questions are answered thoroughly, demonstrating an advanced understanding of organ interdependence and systemic unity.	Questions are answered completely with good scientific basis, though missing a deeper connection to systems biology.	Answers are brief, fragmented, or treat the organs as separate entities rather than an interacting network.	Questions are left unanswered or show major misconceptions.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	12	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – Effects of Damage on Interacting Organ Systems**		
Name		**Grade & Section**	

Activity: Which System Needs Help First? – Scenarios

Directions: Read each scenario. Select the immediate priority stated in the prompt and justify your answer using evidence about how the affected organ systems interact.

Scenario 1: During a basketball game, an athlete suffers a torn ACL, collapses, and cannot stand normally. Which immediate priority is more appropriate: stabilizing the injured musculoskeletal area or attempting to make the muscles work harder? Justify your answer using evidence about interacting systems.

Response:

_____

_____

Scenario 2: During a school event, a student with asthma is wheezing and clutching their chest. Which immediate priority is more appropriate: following the student's established asthma action plan to address airflow or focusing first on calming the heart rate? Justify your answer using evidence about interacting systems.

Response:

_____

_____

Safety: Follow the person's established medical or emergency guidance and seek appropriate adult or emergency assistance. Do not improvise treatment or simulate respiratory distress through breath-holding or forced rapid breathing.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	12	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – Effects of Damage on Interacting Organ Systems**		
Name		**Grade & Section**	

Activity: Case-Based Concept Mapping

Directions: Work in pairs. Create a concept map centered on either a torn ACL or an asthma attack. Trace effects across the relevant body systems, explain how the systems interact, and identify limits of compensation.

a) A basketball player collapses mid-game, clutching their knee after a torn anterior cruciate ligament (ACL). How can one injury affect the muscular and skeletal systems and, in turn, the organism as a whole?

b) Health clarification: Mild asthma may occur with adequate oxygenation, whereas severe attacks can lower oxygenation. Follow the individual's asthma action plan and prescribed quick-relief medicine, and seek emergency help for severe or non-improving symptoms. Not every inhaler is a bronchodilator. An ACL is a ligament in the musculoskeletal system, and management is individualized.



a. Torn ACL



b) Asthma attack

Process Questions:

1. What changes occur in the muscular system when the ACL is damaged?

_____

_____

_____

_____.

2. How do muscles compensate for the loss of ligament support?

_____
_____
_____
_____.

3. How does reduced oxygen availability affect the heart and blood vessels?

_____
_____
_____
_____.

4. What symptoms indicate that both systems are under stress (asthma attack)?

_____
_____
_____
_____.

5. What does this case reveal about the interdependence of body systems?

_____
_____
_____
_____.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	13	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – Nervous and Endocrine Regulation of Body Temperature**		
Name		**Grade & Section**	

Objective(s): By the end of the activity, you should be able to:

- Identify physiological challenges in extreme heat and cold.
- Explain how the nervous and endocrine systems respond to maintain homeostasis
- Design a survival kit with scientifically justified items that support body regulation.
- Collaborate and present findings using visual or digital formats

Materials:

- Manila paper or cartolina
- Markers, crayons, pens, sticky notes
- Scissors, tape, glue
- Printed pictures/magazines (optional)
- Digital tools (PowerPoint, Canva, or Google Slides; optional)

Direction:

1. **Grouping and Differentiation**
   - Work in your assigned group of 4–6 members.
   - Assign roles such as researcher, designer, recorder, and presenter so that all members contribute.
   - Use the output format approved for your group: poster, slide deck, or simple physical mock-up.
   - Ask for clarification or a visual guide when you need additional support.

2. **Procedure**
   a. **Scenario Presentation:**
   "Imagine you are preparing a survival kit for someone living in a desert or a snowy mountain. What items would you include to help the body maintain homeostasis?"

   b. **Group Assignment:**
   Complete the HOT (desert) or COLD (snowy mountain) scenario assigned to your group.

c. Discussion and Planning:

- Identify physiological challenges (e.g., dehydration, frostbite).
- Describe body responses through nervous and endocrine systems (e.g., sweating, hormone release).
- Choose safe survival items and explain how each supports thermoregulation. Do not include prescription medicines, hormones, or other medical treatments as kit items.

d. Design Phase:

- Create a poster, slide deck, or physical mock-up of the survival kit.
- Include explanations for each item:
    1. Supported body system
    2. Related nervous/endocrine response
    3. Role in maintaining homeostasis

e. Presentation and Comparison:

- Present your group's survival kit.
- Compare your group's strategy with another group and note one important similarity or difference.

Guiding Questions:

1. Why is water more important in hot environments compared to cold ones?

    _____
    _____
    _____

2. How does clothing choice affect thermoregulation?

    _____
    _____
    _____

3. Which hormones are the most active in extreme temperatures?

    _____
    _____
    _____

4. What happens if a key survival item is missing?

    _____
    _____
    _____

5. How do the nervous and endocrine systems coordinate to maintain balance?

    _____
    _____
    _____

Rubric for the Survival Kit Design

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)
Scientific Accuracy				
Creativity and Presentation				
Team Collaboration				
Explanation of Body Responses				
Application of Concepts				

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	14	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – How Vaccines Support the Immune and Lymphatic Systems**		
Name		**Grade & Section**	

Activity: K-W-L Chart

Learning Objectives:
By the end of this activity, you should be able to:

1. Recall prior knowledge about the immune and lymphatic systems.
2. Identify known ideas and uncertain concepts regarding immunity and vaccination.
3. Formulate questions about the functions of the immune and lymphatic systems and the role of vaccines.
4. Organize ideas using a K-W-L chart.

Materials Needed

Pen or pencil

Procedure

1. Complete the K-W-L chart using the format provided below.
2. Read each scenario carefully.
3. In the **What I Certainly Know** column, write facts or ideas that you are confident are correct based on your prior learning or experience.
4. In the **Somehow I Know** column, write ideas that you think are correct but would like to verify or clarify.
5. In the **What I Want to Know** column, write questions or things you are curious about regarding the scenario.
6. Complete all rows in the chart.

Output Format (K-W-L Chart)

Scenario	What I Certainly Know	Somehow I Know	What I Want to Know
When someone gets cut			
Ana had chickenpox in			

Scenario	What I Certainly Know	Somehow I Know	What I Want to Know
Grade 3. When her younger brother got it, she did not get sick again.			
After getting a vaccine, a student develops a mild fever and experiences arm soreness.			

Reflection Questions

1. What new questions did you realize you had about the immune and lymphatic systems?

   _____

   _____

2. Why is it important to identify what you already know before learning about a new topic?

   _____

   _____

3. How can asking questions help you better understand health-related issues, such as vaccination?

   _____

   _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	14	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – How Vaccines Support the Immune and Lymphatic Systems**		
Name		**Grade & Section**	

Activity: Immune Defense Cause-and-Effect Chain

Learning Objectives:
By the end of this activity, you should be able to:

1. Describe the sequence of events involved in the body's immune response to a pathogen.
2. Explain how vaccines and booster shots stimulate immune memory, antibody production, and enhanced immune protection.
3. Illustrate the cause-and-effect relationship between pathogen exposure and disease prevention.
4. Use scientific concepts and terminology related to the immune response and vaccination accurately.

Materials Needed:

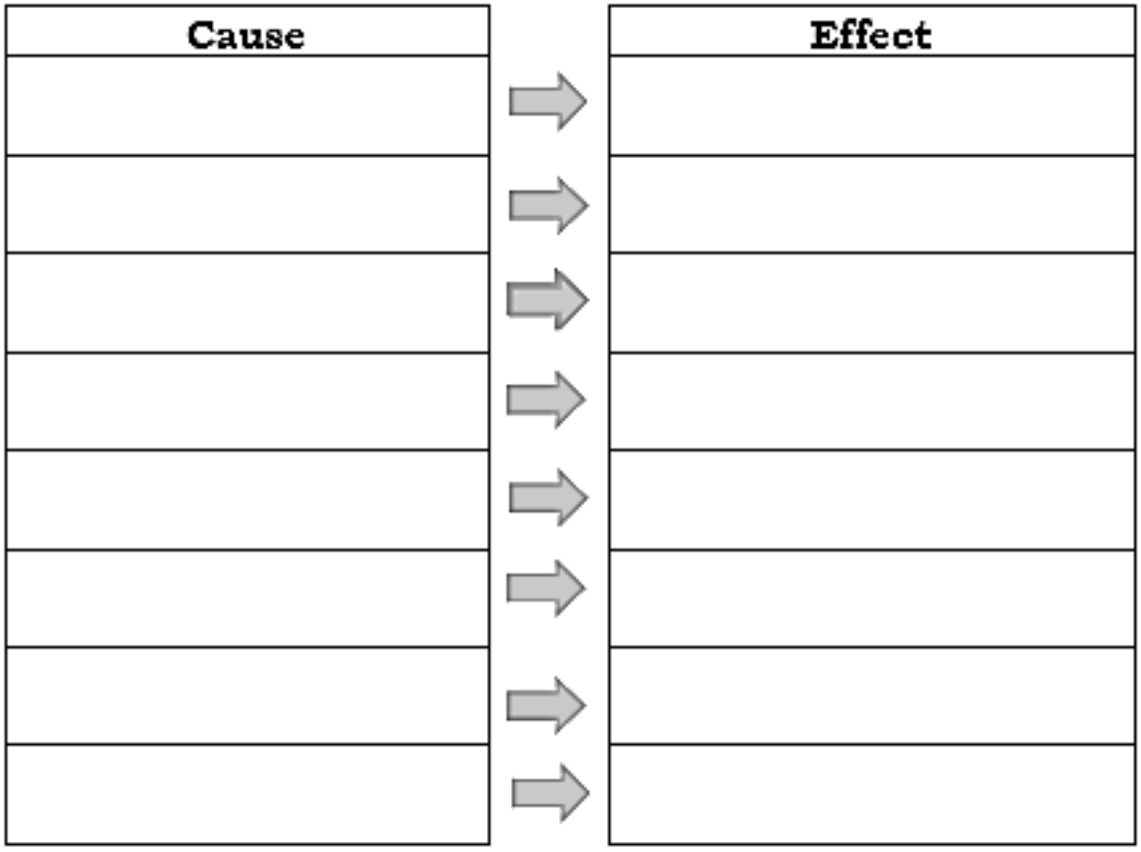
- Pen or pencil
- Coloring materials (colored pencils, crayons, or markers)

Procedure:

1. Read the vaccine booster scenario provided by your teacher.
2. Analyze how a booster vaccine strengthens the body's immune response.
3. Complete the cause-and-effect chain showing the sequence of events from pathogen entry to disease prevention.
4. Include the following important events in your diagram:
   - Pathogen entry
   - Immune system activation
   - Antibody production
   - Formation of memory cells
   - Booster vaccination
   - Affinity maturation
   - Enhanced immune response
   - Disease prevention
5. Label each step clearly using appropriate scientific terms.

6. Use colors to distinguish the following:
   - **Red** – Immune System Components
   - **Blue** – Lymphatic System Components
   - **Yellow** – Vaccine Effects
7. Use following cause-and-effect diagram below showing the sequence of events from pathogen entry to disease prevention.
8. Review your diagram for accuracy, completeness, proper sequencing, and correct use of color coding.

Cause-and-Effect Diagram



Assessment

Your work will be evaluated using the following rubric:

Criteria	4 – Excellent	3 – Proficient	2 – Developing	1 – Beginning	Points
Science Accuracy (Immune Response and Vaccine Mechanism)	All cause-and-effect relationships are scientifically correct, including booster response, antibody production, and affinity maturation.	Mostly correct with minor inaccuracies.	Some correct ideas but with noticeable misconceptions.	Scientific explanation is incorrect or missing.	/4
Correct Sequencing of Immune Response (Cause-and-Effect Flow)	Complete, logical, and accurate sequence from pathogen entry to disease prevention.	Mostly correct sequence with minor gaps.	Partial sequence with several missing or misplaced steps.	Sequence is incorrect or incomplete.	/4
Understanding of Vaccine Function (Booster and Immune Memory)	Clearly explains how boosters enhance immune memory, antibody production, and affinity maturation.	Good explanation with minor gaps.	Partial understanding of vaccine response.	Does not understand vaccine function.	/4
Clarity and Organization of Diagram (Cause-and-Effect Structure)	Diagram is well-organized, clearly labeled, and easy to understand.	Mostly clear with minor organizational issues.	Somewhat unclear or lacks structure.	Disorganized and difficult to understand.	/4
Use of Scientific Concepts and Terminology	Correct and appropriate use of scientific terms throughout the diagram.	Mostly correct use of scientific terms.	Limited or inconsistent use of scientific vocabulary.	Incorrect or no use of scientific terms.	/4
Use of Visual Coding (Color Differentiation Requirement)	Clearly and correctly uses colors to distinguish categories.	Mostly correct color coding.	Limited or partially correct color coding.	No color coding or incorrect use of colors.	/4

Total: /24

Reflection Questions:

1. Why are memory cells important in protecting the body from future infections?

   _____

   _____

2. How do booster vaccines strengthen the immune response?

   _____

   _____

3. Why is vaccination considered an important public health measure?

   _____

   _____

4. How does understanding the immune response help individuals make informed health decisions?

   _____

   _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	14	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – How Vaccines Support the Immune and Lymphatic Systems**		
Name		**Grade & Section**	

Activity: K-W-L Continuation

Learning Objectives

By the end of this activity, you should be able to:

1. Recall prior knowledge about immune responses and disease prevention.
2. Compare prior ideas with new learning about immunity.
3. Summarize key concepts learned from the lesson.
4. Organize scientific ideas using a KWL chart.

Materials Needed

Pen or pencil

Procedure

1. Review your previously completed KWL Chart (What I Certainly Know and What I Want to Know).
2. Continue completing the chart by filling in the **"What I Learned"** column.
3. Based on the lesson discussion, summarize your key takeaways about immunity and disease protection.
4. Use complete and clear sentences when writing your answers.
5. Ensure that your responses reflect correct scientific understanding.

Output Format (KWL Chart Continuation)

Scenario	What I Certainly Know	What I Want to Know	What I Learned
When someone gets cut			
Ana had chickenpox in Grade 3. When her younger brother got it, she did not get sick again.			

Scenario	What I Certainly Know	What I Want to Know	What I Learned
After getting a vaccine, a student develops a mild fever and experiences arm soreness.			

Reflection

1. What new ideas did you learn about how the body protects itself from infection?

   _____

   _____

2. How did your understanding of immunity change after completing the lesson?

   _____

   _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	14	**Date**	
Lesson Title/Topic:	**Organ Systems Working Together – How Vaccines Support the Immune and Lymphatic Systems**		
Name		**Grade & Section**	

Activity: One Sentence, Big Idea

Learning Objectives

By the end of this activity, you should be able to:

1. Identify the key functions of immune and lymphatic systems.
2. Explain how vaccines stimulate immune responses and memory cell formation.
3. Synthesize your learning into a single, meaningful generalization.
4. Communicate scientific understanding through a clear, complete sentence.

Materials Needed

Pen or pencil

Procedure

1. Review your learning about:
   - Major components and functions of the immune and lymphatic systems
   - How these systems work together to defend the body
   - How vaccines trigger immune responses
   - The importance of vaccination for individuals and communities
2. Identify the big idea of the lesson.
3. Write one complete sentence that summarizes your understanding of the topic.
4. Your sentence must include:
   - A main idea (generalization)
   - A supporting explanation or example from the lesson
5. Write your sentence clearly and prepare to share it with the class.

One-Sentence Big Idea
Write your response using this format:

"Main idea about the immune and lymphatic systems + vaccines + explanation/example from the lesson."

_____
_____
_____

Guide Sentence Starter (Optional)
"The immune and lymphatic systems work together to ___, and vaccines help ___ by ___, for example ___."

Reflection Prompt:

1. Why is it important to summarize learning into one big idea?
   _____
   _____

2. How did vaccines help you understand the concept of immune memory?
   _____
   _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	15	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Understanding Climate Change**		
Name		**Grade & Section**	

Activity: Describe the Data

Objective(s): At the end of the activity, you should be able to interpret scientific data and visual evidence to describe climate change accurately, using cause-effect language and specific details.

Materials Needed: Pen or pencil and the graphs or images provided in this LAS or displayed by your teacher.

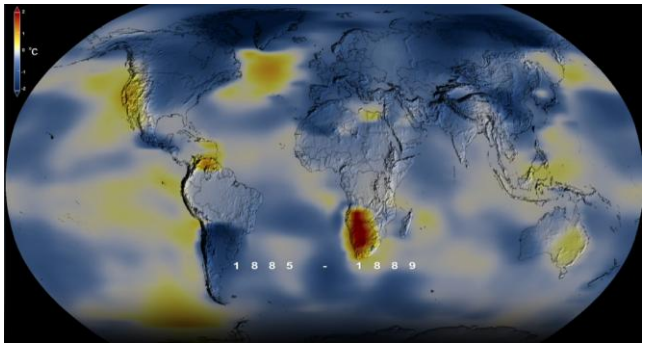
Instructions:

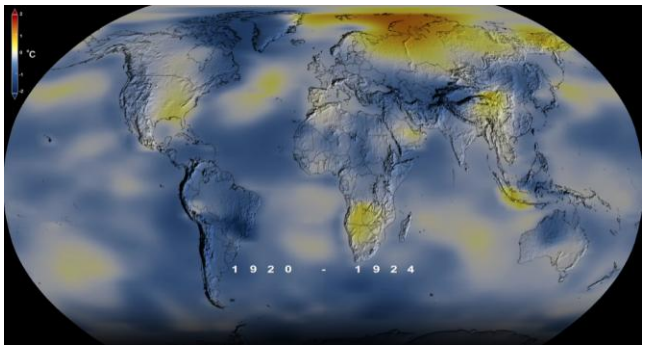
For each graph or image, write 2–3 sentences describing what the evidence shows. Distinguish the observed trend from its interpretation. Do not claim that a single graph or event by itself proves causation; use cautious wording such as “is consistent with” when attribution is uncertain.

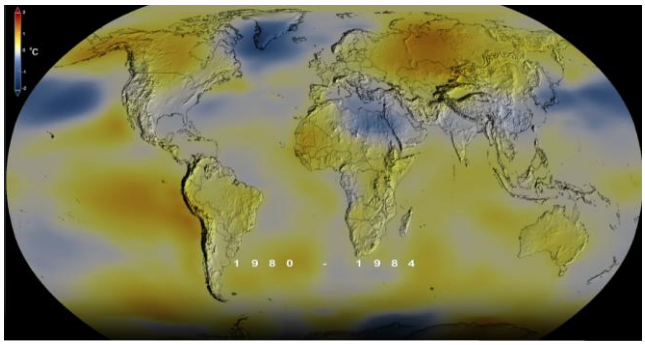
Use these description frames to guide your answers:

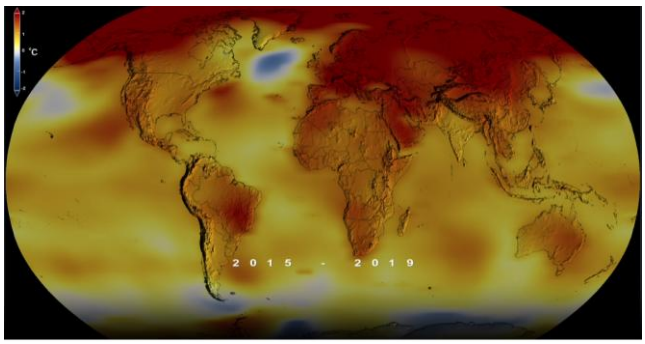
- This graph or image shows _____, which means _____.
- The data indicates that _____. This pattern is consistent with _____ because _____.
- Compared to _____, we can observe _____, which describes _____."

1. Global Temperature Anomalies from 1880 to 2020- NASA Scientific Visualization Studio.









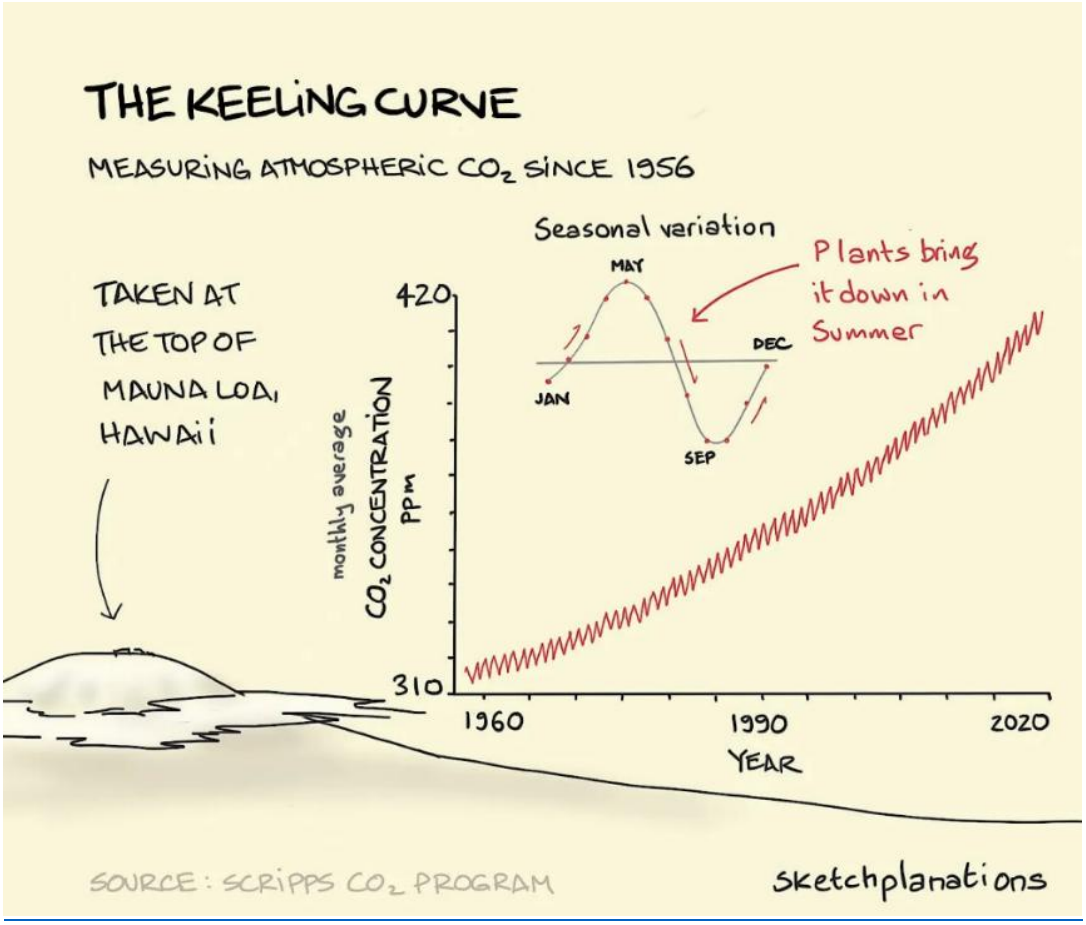
Data Card Interpretation: _____

_____

_____

_____

2. Emission Index. “The Keeling Curve.” Accessed May 26, 2026. Emission Index. https://www.emission-index.com/climate-change/keeling-curve



Data Card Interpretation: _____

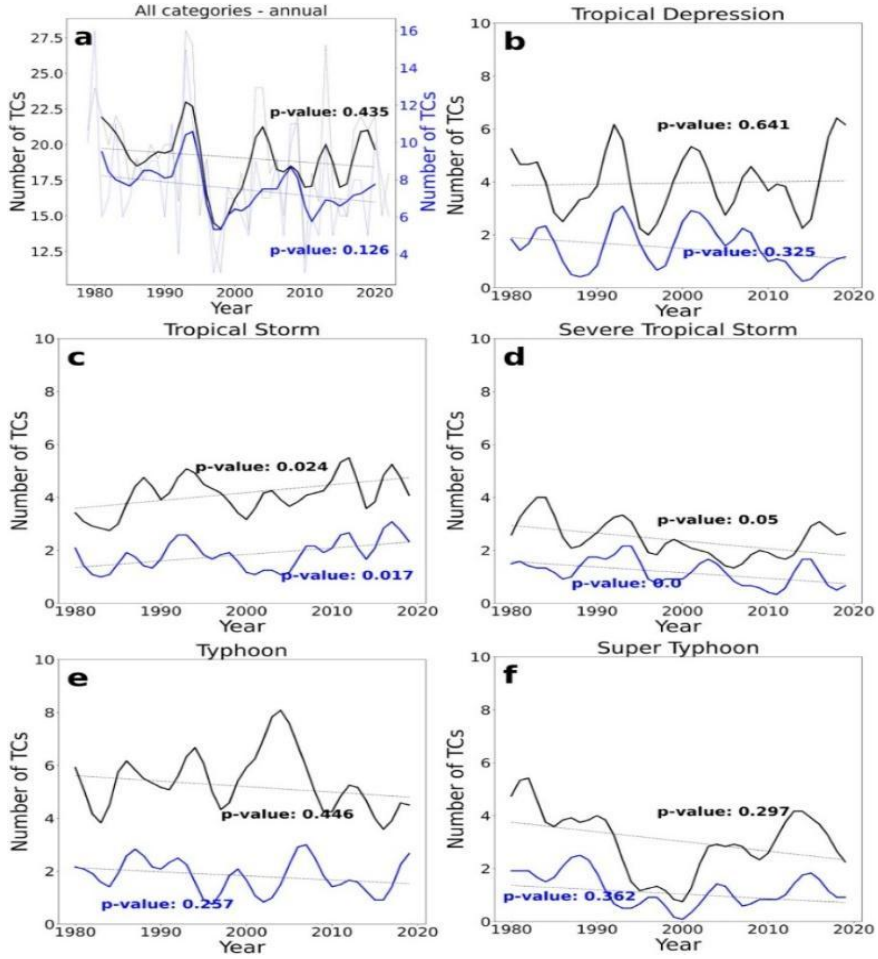
_____

_____

_____

_____

3. Philippine typhoon frequency 1970–2020 (PAGASA)



Data Card Interpretation: _____

4. Before/after glacier photograph



Data Card Interpretation: _____

_____

_____

_____

_____

5. Coastal flooding image



Data Card Interpretation: _____

_____

_____

_____

_____

Guide Questions:

1. Based on the data cards, how would you describe climate change in your own words?

   _____
   _____
   _____
   _____

2. Which words or phrases best explain what climate change means?

   _____
   _____
   _____
   _____

3. How do the graphs and images help you understand the meaning of climate change?

   _____
   _____
   _____
   _____

Synthesis:

4. How did you arrive at your description of climate change?

   _____
   _____
   _____
   _____

5. How did you find the activity? Can you share and describe your experience?

   _____
   _____
   _____
   _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	16	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Biological Responses to Climate Change in the Philippines**		
Name		**Grade & Section**	

Activity: Organism Responses—Climate Edition

Objective(s): At the end of the activity, you should be able to describe how organisms respond to climate-related stressors and explain what these responses mean for survival and biodiversity in the Philippines.

Materials Needed: Pen and Paper

Instructions:

a. Choose one organism from Box 1 and one stressor from Box 2.
b. Identify and write down:
   - Biological Response: Describe a plausible response. Classify it as behavioral, physiological, a range or distribution change, a phenological change, or a population-level evolutionary adaptation. Do not describe an individual organism as genetically adapting within its lifetime.
   - Link/Explanation: Why this response occurs, and what survival consequences follow.
   - Philippine Example: Give a real or scientifically plausible local example. If evidence is not provided, label the example as a hypothesis or plausible response rather than an established fact.

BOX 1 (organisms)	**BOX 2 (stressors)**
Coral	Rising sea temperature
Rice plant	Erratic rainfall
Philippine Eagle	Drought
Mangrove tree	Ocean acidification
Tilapia fish	Habitat loss
Mango tree	Pest outbreaks

Activity Table

Organism	Climate Stressor	Biological Response	Link/Explanation	Philippine Example
1.				
2.				
3.				
4.				
5.				
6.				

Guide Questions:

1. Based on your chosen organism and stressor, how does the biological system respond to climate change?

   _____
   _____
   _____

2. How does this response help you understand the effects of climate change on living organisms in the Philippines?

   _____
   _____
   _____

3. What does this example show about the challenges organisms face when the environment changes?

   _____
   _____
   _____

Synthesis:

- How did you arrive at your description of the organism's response?

  _____
  _____
  _____

- How did you find the activity? Can you share and describe your experience?

  _____
  _____
  _____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	17	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Impacts of Climate Change on Philippine Ecosystems**		
Name		**Grade & Section**	

Activity: Ecosystem Connections: Climate Change Impact Mapping

Learning Objectives:

- Identify the major ecosystems in the Philippines.
- Explain different ways climate change may affect Philippine ecosystems.
- Describe and analyze real-world examples of climate-related impacts in the country using evidence.
- Explain how climate change impacts Philippine ecosystems and how these impacts affect organisms, resources, and human communities.

Materials:

Pen or pencil and the teacher-provided source or material, or a digital tool, as available.

Directions:

Match Philippine ecosystems with possible climate change impacts. Explain each match using cause-and-effect reasoning.

Guide Questions:

1. Which impact matches each ecosystem?
   Answer: _____

2. What evidence or scientific reason supports your match?
   Answer: _____

3. How might one impact lead to another effect in the ecosystem?
   Answer: _____

4. What misconception did your group clarify?
   Answer: _____

Activity Table

Ecosystem	Possible Climate Impact	Cause-and-Effect Explanation	Example in the Philippines

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	17	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Impacts of Climate Change on Philippine Ecosystems**		
Name		**Grade & Section**	

Activity: ECOSYSTEM IN A JAR (CLIMATE CHANGE IMPACTS)
Model limitation: This is a short-term model of soil, moisture, and disturbance. It does not reproduce long-term climate change and cannot prove that a specific flood, drought, or storm was caused by climate change. Use teacher-provided seedlings or nonliving model materials; do not collect wild organisms.

Learning Objectives:

- Identify the major ecosystems in the Philippines.
- Explain different ways climate change may affect Philippine ecosystems.
- Describe and analyze real-world examples of climate-related impacts in the country using evidence.
- Explain how climate change impacts Philippine ecosystems and how these impacts affect organisms, resources, and human communities.

Materials:
Clear jar or container, soil, water, small plants or safe substitutes, labels, event cards, paper, and pen.

Procedure:

1. Work in a group and prepare matched control and treatment containers using the same type of container, soil, teacher-provided plant or nonliving material, light, temperature, and starting amount of water.
2. Apply only the standardized moisture or disturbance treatment assigned by your teacher to the treatment container. Keep the matched control unchanged. Record exactly what was done and observe both containers on the same schedule for several days.

Observation Guide

Before the Climate Event Simulation

Directions: Observe your mini ecosystem before applying the simulated climate event. Record what you see.

Observation Point	What do you observe?
Soil condition	
Amount of water/moisture	
Plant appearance	
Position/stability of plants	
Clarity/color of water, if present	
Other living/nonliving parts	

During the Climate Event Simulation

Directions: Record what your group did to simulate the climate event.

Guide Question	Response
What climate event did your group simulate?	
What action did your group take to represent the event?	
Which part of the ecosystem was directly affected first?	
What immediate change did you notice?	

After the Climate Event Simulation

Directions: Observe the mini ecosystem after the simulation. Compare it with your observations before the event.

Ecosystem Component	Before the Event	After the Event	Change Observed
Soil			
Water/moisture			
Plants			
Stability of materials			
Other observations			

After the simulation, answer the following processing questions:

1. How did your mini ecosystem change after the climate event?
2. Which part of the system was most vulnerable, and why?
3. How do these changes mirror what happens in real Philippine ecosystems?
4. What can people do to reduce the impact of these changes in their communities?

Rubrics for short answers

Score	Verbal Interpretation	Description
4	**Excellent**	The answer is complete, accurate, and clearly explained. It directly answers the question and includes important details or examples.
3	**Very Good**	The answer is mostly accurate and answers the question well, but it may lack some details or examples.
2	**Satisfactory**	The answer shows a basic understanding but is incomplete, unclear, or missing important details.
1	**Needs Improvement**	The answer is mostly incorrect, unclear, or only slightly related to the question.
0	**No Response**	No answer is given, or the response is completely unrelated to the question.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	17	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Impacts of Climate Change on Philippine Ecosystems**		
Name		**Grade & Section**	

Activity: Ecosystem Case Study Carousel

Learning Objectives

- Identify the major ecosystems in the Philippines.
- Explain different ways climate change may affect Philippine ecosystems.
- Describe and analyze real-world examples of climate-related impacts in the country using evidence.
- Explain how climate change impacts Philippine ecosystems and how these impacts affect organisms, resources, and human communities.

Materials

Pen or pencil and the assigned case study or article or digital source, as available.

Directions

1. Form small groups and assign your group to a Philippine ecosystem (forest, coral reef, mangrove, freshwater, agricultural land).
2. Read the assigned article or learning materials and answer guide questions in the table below.

Case Study or Article Title: _____

Guide Question	Group Response
What ecosystem is described?	
What climate-related impacts are observed?	
What trend or patterns can you observe?	
How does this affect biodiversity?	
How does this affect people or communities?	
What actions can help reduce or address the impact?	

3. Move around the case study stations. Read each scenario and identify the ecosystem, climate-related issue, affected organisms, community effects, and possible responses.
4. Groups rotate to review other groups' outputs.
5. Groups must add at least one new insight, one question or one recommendation to the output.

Carousel Peer Comment Section

Peer Group	New Insight / Question / Recommendation
Group ___	
Group ___	
Group ___	

Group Reflection:

One important thing we learned from this activity is _____.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	17	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Impacts of Climate Change on Philippine Ecosystems**		
Name		**Grade & Section**	

Activity: Local News Analysis

Learning Objectives:

- Identify the major ecosystems in the Philippines.
- Explain different ways climate change may affect Philippine ecosystems.
- Describe and analyze real-world examples of climate-related impacts in the country using evidence.
- Explain how climate change impacts Philippine ecosystems and how these impacts affect organisms, resources, and human communities.

Materials:

Pen or pencil and a credible assigned or located articles or source, in print or digital form.

Directions:

1. Find a credible news article published within the last two years from a recognized news organization, government agency, or environmental organization about a documented climate-related impact on a Philippine ecosystem.

Task: Summarize the article in your own words and answer the prompts using evidence from the source. Separate documented observations from climate attribution; one event alone should not automatically be described as caused by climate change.

a. What kind of ecosystem was affected?
b. What climate change factor was involved?
c. How did the impact affect Filipinos' livelihood, health, or safety?
d. What solutions were suggested in the news?

Local News Response Organizer

Response Item	Your Response
Article summary	
Ecosystem affected	
Climate-related factor/trend and supporting evidence	
Effect on livelihoods, health, or safety	
Solutions suggested in the source	

Rubrics for the activity

Criteria	4 - Excellent	3 - Very Good	2 - Satisfactory	1 - Needs Improvement	0 - No Response
1. Credibility and Relevance of the News Article	The article is from a credible source, published within the last two years, and clearly focuses on climate change impacts on a Philippine ecosystem.	The article is credible and related to climate change and Philippine ecosystems, but the connection may not be fully clear or the date or source is not completely stated.	The article is somewhat related, but the source may be unclear, less credible, or only partly connected to climate change impacts.	The article is not credible, outdated, or barely related to the activity.	No article was provided.
2. Summary of the Article	The summary is clear, complete, and written in the learner's own words. It includes the main idea, important details, and evidence from the article.	The summary is mostly clear and written in the learner's own words, but some details or evidence are missing.	The summary gives the basic idea of the article but is incomplete, unclear, or has limited details.	The summary is confusing, copied, or does not demonstrate understanding of the article.	No summary was written.
3. Identification of Affected Ecosystem	Correctly identifies the ecosystem affected, such as forest, coral reef, mangrove, agricultural land, freshwater, coastal, or marine ecosystem, and gives a brief explanation.	Correctly identifies the ecosystem but gives little explanation.	Identifies an ecosystem, but the answer is vague or only partly correct.	The ecosystem identified is incorrect or not connected to the article.	No answer was given.

Criteria	4 - Excellent	3 - Very Good	2 - Satisfactory	1 - Needs Improvement	0 - No Response
4. Identification of Climate Change Factor	Clearly identifies the climate change factor involved, such as extreme rainfall, flooding, drought, sea level rise, stronger typhoons, ocean warming, or coral bleaching, and explains its connection to the article.	Identifies the climate change factor correctly but gives limited explanation.	Identifies a possible factor, but the answer is unclear or not fully connected to climate change.	The climate change factor is incorrect or unrelated to the article.	No answer was given.
5. Explanation of Effects on Livelihood, Health, or Safety	Clearly explains how the impact affected Filipinos' livelihood, health, or safety using specific details from the article.	Explains the effect on livelihood, health, or safety, but with limited details.	Gives a basic explanation, but the connection to people's lives is weak or incomplete.	The explanation is unclear, incorrect, or unrelated to the article.	No answer was given.
6. Suggested Solutions from the News	Clearly describes the solutions suggested in the article and explains how they may help address the problem.	Identifies the suggested solutions but gives limited explanation.	Mentions a solution, but it is vague or not clearly based on the article.	The solution is incorrect, unrealistic, or unrelated to the article.	No answer was given.
7. Use of Evidence and Analysis	Uses clear evidence from the article and shows thoughtful analysis of how climate change affects ecosystems, organisms, resources, and communities.	Uses some evidence and shows good understanding, but the analysis may lack depth.	Uses limited evidence and shows basic understanding of the issue.	Uses little or no evidence and shows weak understanding.	No evidence or analysis was provided.
8. Organization, Grammar, and Neatness	Answers are well-organized, easy to understand, and have very few grammar or spelling errors.	Answers are organized and understandable, with some minor grammar or spelling errors.	Answers are somewhat organized but may contain several errors that affect clarity.	Answers are disorganized, difficult to understand, or have many errors.	No written output was submitted.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	17	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Impacts of Climate Change on Philippine Ecosystems**		
Name		**Grade & Section**	

Activity: Ecosystem Impact Analysis

Learning Objectives

- Identify the major ecosystems in the Philippines.
- Explain different ways climate change may affect Philippine ecosystems.
- Describe and analyze real-world examples of climate-related impacts in the country using evidence.
- Explain how climate change impacts Philippine ecosystems and how these impacts affect organisms, resources, and human communities.

Materials

Pen or pencil and the teacher-provided source or material or digital tool, as available.

Directions

Analyze each scenario showing one ecosystem impact using cause-and-effect reasoning. Include climate factors, human activities, affected organisms, and possible responses.

Scenario 1

A coral reef in Palawan is turning white due to increasing ocean temperatures.

1. What ecosystem is described?
2. What climate change impact is shown?
3. How does this affect marine life?
4. How might this affect people living nearby?

Responses:

1. _____
2. _____
3. _____
4. _____

Scenario 2

Rice farmers in Central Luzon experience low crop yields due to long periods of drought.

1. What ecosystem is described?
2. What climate change impact is shown?
3. How does this affect agriculture?
4. How might this affect people's livelihoods?

Responses:

1. _____
2. _____
3. _____
4. _____

Scenario 3

A coastal community in Leyte experiences flooding after a tropical cyclone and substantial mangrove damage. Any claim that climate change altered that specific event requires attribution evidence. Mangrove loss may also reflect land use, pollution, coastal development, and other local drivers.

1. What ecosystem is described?
2. What climate change impact is shown?
3. What role do mangroves play in this ecosystem?
4. How does this impact the community?

Responses:

1. _____
2. _____
3. _____
4. _____

Reflect: "What action would you recommend to reduce or address the flooding and mangrove damage?"

_____
_____
_____
_____

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	18	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Climate Change Adaptation and Mitigation for Local Biodiversity**		
Name		**Grade & Section**	

Activity: Matching Type

Instructions: Match each climate change impact in Column A with the most appropriate adaptation or mitigation strategy in Column B. Write the letter of the correct strategy beside each number.

Column A
Climate Change Impacts

1. Rising sea levels affecting coastal mangroves
2. Increased frequency of forest wildfires
3. Coral bleaching due to rising ocean temperatures
4. Decline in pollinator populations (bees, butterflies)
5. Habitat loss from urban expansion
6. Species migration to cooler areas
7. Soil erosion from heavy rainfall
8. Overfishing reducing marine biodiversity
9. Deforestation reducing carbon absorption capacity
10. Invasive species spreading due to warmer climate

Column B
Adaptation/Mitigation Strategies

A. Establishing marine protected areas and regulating fishing practices
B. Planting native trees and creating firebreaks to reduce wildfire spread
C. Promoting urban green spaces and wildlife corridors
D. Practicing sustainable agriculture and soil conservation methods
E. Supporting community-based mangrove reforestation projects
F. Reducing greenhouse gas emissions through renewable energy use
G. Creating pollinator-friendly gardens and reducing pesticide use
H. Developing conservation programs to monitor and protect migrating species
I. Implementing reforestation and afforestation projects to restore forest cover
J. Controlling invasive species through monitoring and ecological management

For each number, write one sentence explaining why the matched strategy is adaptation, mitigation, or both.

No.	Matched Letter	Classification (Adaptation, Mitigation, or Both)	One-Sentence Explanation
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	18	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Climate Change Adaptation and Mitigation for Local Biodiversity**		
Name		**Grade & Section**	

Activity: True or False Check

Instructions: Read each statement carefully. Write True if the statement correctly describes an adaptation or mitigation strategy related to climate change and biodiversity. Write False if the statement is incorrect. After each answer, write one sentence explaining your answer. In your explanation, identify whether the statement is about adaptation, mitigation, or both.

No.	Statement	True or False	Short Explanation
1	Planting drought-resistant crops helps farmers adapt to reduced rainfall caused by climate change.		
2	Protecting wetlands can reduce flooding impacts and provide habitats for diverse species.		
3	Switching to single-use plastics is a good way to mitigate climate change impacts on biodiversity.		
4	Establishing seed banks preserves genetic diversity and helps species adapt to changing climates.		
5	Overuse of chemical fertilizers improves soil resilience against climate change.		

No.	Statement	True or False	Short Explanation
6	Creating wildlife corridors allows animals to safely migrate when their habitats shift due to warming.		
7	Promoting renewable energy sources reduces greenhouse gas emissions and slows biodiversity loss.		
8	Introducing non-native species is an effective way to increase biodiversity under climate stress.		
9	Community-led reforestation projects can restore degraded ecosystems and absorb carbon dioxide.		
10	Conserving traditional farming practices, such as crop rotation, can strengthen ecosystems against climate impacts.		

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	18	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Climate Change Adaptation and Mitigation for Local Biodiversity**		
Name		**Grade & Section**	

Activity: Local Solutions for Climate & Biodiversity

Instructions: Work with a partner or small group. Think of two everyday sustainable practices that people in your community can adopt. These may be related to farming, waste management, water conservation, energy use, gardening, transportation, or community projects.

Sustainable Practice	How does this reduce climate impacts?	How does this support biodiversity?

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	18	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Climate Change Adaptation and Mitigation for Local Biodiversity**		
Name		**Grade & Section**	

Activity: Policy Innovation
Instructions: Imagine that you are part of your local government council. Draft one new policy idea that could help your community adapt to or mitigate the effects of climate change on local biodiversity.

Policy Title:

1. What problem does this policy address?

2. What will people in the community do under this policy?

3. How will this policy help people?

4. How will this policy protect ecosystems or biodiversity?

5. Is your policy mainly about adaptation, mitigation, or both? Explain briefly.

LEARNING ACTIVITY SHEET (LAS)

Learning Area	General Science	**Term**	2
Lesson Exemplar	19	**Date**	
Lesson Title/Topic:	**Philippine Ecosystems – Local and Global Effects of Overpopulation**		
Name		**Grade & Section**	

Activity: What If? Scenario Analysis

LEARNING OBJECTIVES:
After completing this Learning Activity Sheet, you should be able to:

1. Define overpopulation and carrying capacity.
2. Explain how overpopulation affects ecosystems and communities.
3. Analyze the possible consequences of population growth on limited resources.
4. Propose practical and sustainable solutions to problems associated with overpopulation.
5. Recognize the importance of responsible resource management in maintaining ecosystem balance.

BRIEF DISCUSSION:

Every ecosystem has a limit to the number of organisms it can support. This limit is called carrying capacity.

Carrying capacity refers to the maximum population size that an environment can sustainably support using its available resources, such as food, water, space, and other necessities.

When a population grows beyond the carrying capacity of its environment, overpopulation may occur.

Overpopulation

Overpopulation happens when the number of people exceeds the available resources and services needed to support them.

As the population increases, communities may experience:

- Increased waste production
- Water shortages
- Traffic congestion
- Housing overcrowding
- Deforestation
- Pollution
- Flooding
- Increased pressure on public services

These problems can affect both human communities and natural ecosystems. Understanding overpopulation helps individuals and communities develop sustainable solutions that protect resources for present and future generations.

LEARNING ACTIVITY
What If? Scenario Analysis

Directions:
Read each situation carefully.
Analyze the possible effects of the situation and propose realistic solutions.
Complete the table provided.

Scenario 1: Water Shortage
A municipality currently has a sufficient water supply for its residents. However, the population is expected to double over the next 10 years while the water supply remains unchanged.

Guide Questions
1. What problems may arise if the population doubles?
2. How might this affect households and businesses?
3. What environmental impacts may occur?
4. What solutions can help address this issue?

Analysis Table

Possible Effects	Evidence/Reasoning	Possible Solutions

Scenario 2: Waste Accumulation
A city experiences rapid population growth. However, its waste management system has not improved. Garbage collection remains limited and landfill space is nearly full.

Guide Questions
1. How will population growth affect waste production?
2. What problems might communities experience?
3. How could ecosystems be affected?
4. What actions should local governments and citizens take?

Analysis Table

Possible Effects	Evidence/Reasoning	Possible Solutions

Scenario 3: Agricultural Land Conversion

Large areas of farmland are being converted into residential subdivisions to accommodate a growing population.

Guide Questions

1. How can this affect food production?
2. What effects may occur if agricultural land continues to decrease?
3. How might ecosystems be affected?
4. What sustainable solutions can be implemented?

Analysis Table

Possible Effects	Evidence/Reasoning	Possible Solutions

Scenario 4: Urban Migration Without Proper City Planning

Urban migration continues rapidly while city planning, housing, transportation, drainage, waste management, and other public services do not expand at the same pace.

Guide Questions

1. How can rapid urban growth combined with inadequate planning contribute to flood risk?
2. What effects might flooding have on communities?
3. How can flooding affect ecosystems?
4. What solutions can help reduce flood risk?

Analysis Table

Possible Effects	Evidence/Reasoning	Possible Solutions

PART B. COMMUNITY CONNECTION

Directions: Answer the following questions using complete sentences.

1. Which of the four scenarios is most evident in your community?

_____
_____
_____

2. What evidence supports your answer?

_____
_____
_____

3. How does this issue affect people in your community?

_____
_____
_____

4. What actions can community members take to help address the problem?

_____
_____
_____

PART C. COMMUNITY ACTION PLAN

Imagine that you are a member of your barangay environmental committee. Choose ONE issue related to overpopulation and complete the action plan below.

Community Problem	Causes	Effects	Proposed Solution	Expected Outcome

GENERALIZATION

Complete the statements below.

1. Overpopulation occurs when

_____
_____

2. Carrying capacity refers to

_____
_____

3. Overpopulation can negatively affect ecosystems by

_____

_____

4. Sustainable resource management is important because

_____

_____

5. Communities can reduce the effects of overpopulation by

_____

_____

ASSESSMENT

Directions: Read the situation carefully and answer the questions that follow.
Scenario

A city's population increased from 500,000 to 900,000 people within 15 years. During the same period, waste production increased significantly, while drainage systems and waste disposal facilities remained largely unchanged. As a result, flooding incidents became more frequent. These trends alone do not establish that population growth or waste caused the flooding.

1. What trend is shown in the scenario?
   A. Population decreased while flooding increased.
   B. Waste production decreased as population increased.
   C. Population growth, waste production, and flooding increased together.
   D. Flooding incidents remained unchanged.

2. Which statement identifies a plausible mechanism that could increase flood risk without claiming it is the only cause?
   A. Population growth has no effect on flooding.
   B. Higher waste generation combined with inadequate collection can increase drain blockage and flood risk.
   C. Flooding only occurs because of heavy rainfall.
   D. Waste management automatically improves as population increases.

3. Which evidence suggests that the city's carrying capacity may be under pressure?
   A. Population remained stable.
   B. Infrastructure expanded rapidly.
   C. Population and waste increased while facilities remained limited.
   D. Flooding incidents stopped completely.

4. If the current trend continues, which problem is MOST likely to worsen?
   A. Biodiversity recovery
   B. Cleaner waterways
   C. Waste accumulation and urban flooding
   D. Increased agricultural land

5. Which solution would MOST likely help reduce the environmental impacts described?
   A. Ignoring waste management concerns
   B. Expanding recycling programs and improving drainage systems
   C. Increasing migration without planning
   D. Allowing waste to accumulate in waterways

6. Why is sustainable waste management important in highly populated communities?

REFLECTION

Directions: Answer the question below in 3–5 sentences.

How can responsible use of resources help reduce the negative effects of overpopulation in your community?