

Assignment #2

BIOLOGY Unit

Independent Ecosystem (Ecojar) Investigation

DUE DATE: OCTOBER 19, 2015



Introduction

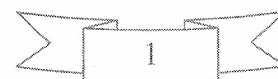
A closed ecosystem is one in which nothing from outside is added to the jar after it is set up, except light. If the ecosystem is set up properly, it will maintain itself, and result in a balanced ecosystem. Being in balance suggests there are correct numbers of individuals in all trophic levels and all the abiotic components required are present. This assignment will demonstrate how living things are dependent on each other and on the abiotic factors around them.

What You Need:

jar	aquatic plants	clean sand	gravel
3 guppies	8 to 10 small snails	water	

Procedure:

- Step 1: Place a small amount of sand and gravel in the bottom of the jar and fill the jar with water (allow the water to dechlorinate for **48** hours).
- Step 2: Measure and record the pH value of the water in the table shown on the next page.
- Step 3: Add a few strands of an aquatic plant such as Elodea, and if available, a few spoonfuls of a small aquatic floating plant such as duckweed.
- Step 4: Place the snails and the fish in the water.
- Step 5: Put the lid on the jar and place in a well-lit area, away from direct sunlight. Keep conditions constant.
- Step 6: Record daily observations of your ecosystem in a journal for seven (7) days. The journal is your responsibility to set up. Entries must include a date, and any noticeable changes to the biotic and abiotic components of your closed ecosystem.
- Step 7: After seven days, measure and record the pH value in the table shown on the next page.
- Step 8: Submit a final investigation report that answers all the questions presented on page 3. All answers must be typewritten, double-spaced, and should be placed in a clear, transparent folder.



Investigation Journal

	Biotic factors	Abiotic factors	pH Values
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

Done (Stage) (✓)		Answer all questions in complete sentences. All answers must be typewritten. Use size 11 font. You must include all these sheets and a cover page.	K	T	C	A
1	1)	List at least three (3) biotic factors of your ecosystem.	✓			
1	2)	List five (5) abiotic factors of your ecosystem.	✓			
1	3)	What trophic (feeding) levels do you have in your ecosystem? (For example, producer, primary consumer, secondary consumer, etc.)	✓			
1	4)	Identify the organisms that are in each trophic (feeding) level.	✓			
1	5)	Give two (2) biotic limiting factors of an aquatic ecosystem.	✓			
1	6)	Give three (3) abiotic limiting factors of a terrestrial ecosystem.	✓			
3	7)	Answer A or B (circle the choice), depending on which applies to you: A) If all or most organisms died, what factors may have contributed to their death? B) If all or most organisms lived, what factors may have contributed to their survival?	✓	✓		
3	8)	What would happen if the ecosystem remained in darkness for three days?		✓		✓
3	9)	What would happen to a balanced ecosystem if ten (10) more of the same fish were added? Why would this happen?		✓		✓
3	10)	How do you account for the difference in the pH levels? (What could have caused this difference?)		✓		✓
3	11)	Explain what would happen to a balanced ecosystem if there were no decomposers (after a long time).		✓	✓	✓
2	12)	Explain how the organisms in the ecosystem bottle are dependent on each other. Cite two examples.	✓		✓	
2	13)	Explain how the organisms in the ecosystem bottle are dependent on the <u>abiotic</u> factors. Cite two examples.	✓		✓	
3	14)	In one paragraph (at least 5 sentences), give a summary of your observations and conclusion(s) for your independent ecosystem.		✓	✓	
2	15)	Suppose that volcanic eruptions send tonnes of particles high into the atmosphere. The particles create clouds of dust that filter out part of the sunlight for a period of one year. Explain thoroughly (and briefly) what might happen to various organisms in an ecosystem following such an event.			✓	✓
2	16)	Give one example to show how a local impact on the environment could affect <u>terrestrial</u> ecosystems around the world.				✓
2	17)	Give one example to show how a local impact on the environment could affect <u>aquatic</u> ecosystems around the world.				✓
3	18)	Mention at least two (2) things or ways that you think you could have done in this investigation in order to maintain or keep a balanced and healthy aquatic ecosystem. Assume that most of your fish died.		✓	✓	✓
2	19)	Go to this link and read the article. http://www.latimes.com/news/local/la-me-0309-dead-fish-20110309.0,2606300.story?track=rss In one paragraph (at least 5 sentences), describe briefly the incident that occurred in Redondo Beach, California. What do you think could have caused this incident? Give at least two reasons.		✓	✓	✓

Student's Name	Course	Date	Task/Activity
	SNC1P		BIOLOGY UNIT: Independent Ecosystem Assignment

Teacher Conversation/Observation Sheet

1st stage: Investigation (Conversation/Observation) - Have attempted to answer questions 1,2,3,4,5,6.	2nd stage: Rough draft (Conversation/Observation) - Have attempted to answer questions 12,13,15,16,17,19 - Show evidence of work.	Final stage: Submission (Student Product) - Must have answered all questions. - Submit a good copy of your work.
Due Date: Oct. 12	Due Date: Oct. 16	Due Date: Oct. 19

K T C A

20) Use processing skills and strategies (e.g., meeting deadlines to get feedback, showing evidence of work, showing evidence of editing/proofreading/revision, making rough drafts, etc.)

√

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C H E C K L I S T

Before the task

- Do I know and understand what the **task** is?
- Have I asked or clarified any unclear **instructions**?
- Are all the **materials** ready and available to carry out the task?
- Do I have the **sequence or procedure** in completing the task laid out well?
- Do I need to do some **research**?
- Is the task to be completed in stages or phases before submitting the final work?
- Have I noted the submission date for the 1st stage/phase?
- Have I noted the submission date for the 2nd stage/phase?
- Have I noted the submission date for the final work?
- Are there any safety precautions or WHMIS guidelines to be followed?

During the task (Before submission of the final work)

- Am I following WHMIS guidelines and taking safety precautions?
- Am I following the procedure accurately?
- Am I recording my data/observations?
- Have I included units and observed the rules on significant digits, if necessary?
- Have I followed the format in presenting my work?
- Have I presented all my work in an organized and neat manner?
- Has my work (1st stage/phase) been proofread or edited?
- Has my work (2nd stage/phase) been proofread or edited?
- Do I have everything needed for the 1st stage/phase?
- Do I have everything needed for the 2nd stage/phase?
- Have I included all drafts and research done for this task?
- Have I written my name on my work?

After the task

- Did I take note of the recommendations to improve my work?
- Did I take note of the corrections to improve my work?
- Did I understand clearly what I have to do to improve my work?
- To improve my mark in this task, I could have _____

	K T C A
21) Use processing skills and strategies (e.g., completing the checklist sheet and success criteria)	√

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Learning Goals

- To show scientific investigation skills in the four areas (planning, performing and recording, making conclusions, and communicating)
- To study how human activity affects land-based or water-based ecosystems and test the effectiveness of possible solutions to environmental sustainability.
- To look for factors related to human activity that affect ecosystems, and describe the effects and results that these factors have for the sustainability of these ecosystems.
- To understand the characteristics of land-based and water-based ecosystems, the link within and between ecosystems, and the impact humans have on the sustainability of these ecosystems.

Success Criteria

Knowledge/Understanding			Level 1 Struggling	Level 2 Pretty Close	Level 3 Grade 9 Standard	Level 4 Above & Beyond!
Yes	No	I can distinguish between terrestrial and aquatic ecosystems. [C]				
Yes	No	I can identify and give examples of biotic and abiotic factors. [C]				
Yes	No	I can identify and give examples of different trophic (feeding) levels. [C]				
Yes	No	I can identify and give examples of biotic and abiotic limiting factors. [C]				
Yes	No	I can explain how biotic factors depend on both abiotic and other biotic factors. [C]				
Thinking						
Yes	No	I can set up my Ecojar properly, and test the water's pH accurately. [O]				
Yes	No	I can complete the Investigation Journal in detail and thoroughly, and can do task(s) for each stage on time. [O]				
Yes	No	I can figure out the effects and results of human activities to ecosystems. [SP]				
Yes	No	I can give a brief summary of my observations and conclusion of this investigation. [SP]				
Yes	No	I can complete/include the checklist sheet, Teacher Conversation/Observation sheet, and this sheet upon submission. [O,SP]				
Communication						
Yes	No	I can express clearly and in full detail my thoughts and ideas to explain my answers. [SP]				
Yes	No	I can give precise and accurate observations and conclusions. [SP]				
Yes	No	I can use appropriate vocabulary, symbols, diagrams, and/or units as needed. [SP]				
Yes	No	I can submit my work in an organized and presentable manner (pagination, cover page, typewritten, etc.). [SP]				
Application						
Yes	No	I can give logical and scientific explanations for the results and impact of human activities and natural phenomena to ecosystems. [SP]				