Project: Artificial Ecosystem Health Technical Report

For this report, you will qualify the health of your ecosystem, support this claim with evidence you have collected, and describe the methodology for collecting evidence. This must be organized into a technical report and submit to [system] by [date/time]. Please format your report using the "Sample Report Template" (below).



Deadlines

- Project begins [date]
- Report is due [date approximately 2 months later]

Grading

Students will be assessed according to the following rubric. Students are encouraged to include work produced in Milestone 1, Milestone 2, Milestone 3, and Milestone 4 as supporting information in their report.

Category	N/A (0 pts)	Beginning (1 pt)	Approaching (2 pts)	Meeting (3 pts)		
Abstract*	Abstract is missing	Abstract is missing	Abstract is missing	Abstract discusses		
	all the following:	two of the following:	one of the following:	background, results,		
	 Background 	 Background 	 Background 	and methods.		
	Results	Results	Results			
	 Methods 	 Methods 	 Methods 			
Methods*	Report does not	Methods are vague.	Methods are detailed	Methods are		
	include discussion of	Difficult to replicate	enough to replicated	detailed. This		
	methods.	experiment.	with some	experiment could be		
			assistance.	replicated easily.		
Results*	Report does not	Results are described	Results are explicitly	Most important		
	explicitly describe	but are not explicitly	described but are	findings are		
	results.	presented.	incomplete.	completely and		
				explicitly described.		
Discussion*	Report does not	Results are discussed	Results are discussed	Results are discussed		
	discuss results.	but is missing two of	but is missing one of	thoroughly with		
		the following:	the following:	mention of		
		 Experimental 	 Experimental 	experimental error,		
		error	error	limitation of		
		 Limitation of 	 Limitation of 	methods, and		
		methods	methods	connection to		
				scientific principles		

		 Connection to scientific principles 	 Connection to scientific principles 	
Language**	Language is informal or has numerous grammar and spelling errors.	Language is occasionally informal or has the occasional grammar and spelling error.	Language is mostly formal or has few grammar and spelling errors.	Language is formal, written in passive voice, and has no grammar spelling issues.
Claim**	Report does not present an accurate central claim.	Report presents an inaccurate central claim.	Report presents an accurate, but incomplete central claim.	Report presents an accurate and complete central claim.
Evidence**	Report does not explicitly identify evidence to support claim.	Report explicitly identifies inappropriate evidence or evidence that does not support the claim.	Report explicitly identifies appropriate, but insufficient evidence. May include some inappropriate evidence.	Report explicitly identifies appropriate and sufficient evidence to support central claim.
Reasoning**	Report does not provide reasoning that links the claim to the evidence.	Report does not provide reasoning is not appropriate.	Report provides reasoning that links claim to evidence. Evidence is repeated or scientific principles are cited, but not sufficient.	Report provides accurate and complete reasoning that links the evidence to the claim. Includes appropriate and sufficient scientific principles.

*Evidence collected within section.

**Evidence collected throughout report.

Sample Report Template

Artificial Ecosystem Report

Abstract

In this experiment, the rate at which plants in the aquaponic tank would grow was measured. This was measured by measuring the plants on top of the tank with a ruler and observing the creatures and plants in the tank. *Cyperus eragrostis* grew the most but *Persicaria lapathifolia* was a close second. Though *Cyperus eragrostis* is native to the southwestern U.S., most grasses grow fast so its rapid growth could be attributed to that.

Results & Discussion

Cyperus eragrostis grew the fastest due to it being native to Arizona and a grass. *Persicaria lapathifolia* is considered native to Arizona, and it does well in moist places, so it makes a good

fit for aquaponics. *Nasturtium officinale* was introduced to Arizona, *Nasturtium officinale* is an aquatic plant so growing in aquaponics could support it well. It grew steadily and towards the end of our observations had a jump up in growth.

With the introduction of water from the river, many things started appearing, such as *Lemna minor* bugs and snails, and little sprouts growing from the bottom of the tank.

Lemna minor is not a native species to Arizona but when it was introduced it spread throughout the tank rapidly. The *Lemna minor* began to get brown and reduced the amount that was in the tank. The small sprouts rapidly spread as well but by week 8 they had all disappeared. It was sporadic when bugs were there but were recorded whenever they were seen, that goes for all the sizes of snails too, sometimes there was lots to see and sometimes there was none.

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10
Cyperus eragrostis (cm)	16.3	16.3	16.7	17.3	18.1	21.5	24.2	27.2	27.5	27.5
Persicaria lapathifolia (cm)	7	7	10.6	11.5	12.8	14	14.1	14.4	17	17
Nasturtium officinale (cm)	1.8	1.8	2.2	3	3.3	3.3	4	4.3	4.5	8
Lemna minor (%)	0%	0%	8%	8%	6%	5%	5%	6%	5%	5%
Bug	0	0	1	1	0	1	1	0	0	0
Bug on wall	0	0	1	1	0	0	0	0	0	1
Tiny Snail	0	0	0	0	1	3	4	2	0	8
Small sprouts (%)	0%	0	0	0	12%	12%	10%	0%	0%	0%
Teen tiny snail	0	0	0	0	0	0	0	0	1	0
Snail	0	0	2	1	0	1	0	0	0	0

Table 1: Growth of plants and animals occupying the tank



Graph 1: Measures of plant growth



Graph 2: % of Lemna minor on top of water

Methods

To conduct this experiment aquaponic tanks were observed to determine how the chosen plants were growing. Every week the data about the plants, water and state of the tank were recorded on a piece of paper. The plants were measured with a ruler in centimeters(cm) and written as such. The state of the tank was estimated by observation; the fish, snails, sprouts growing from the bottom, and *Lemna minor* and written in percentages.