# **Project: Artificial Riparian Ecosystem Part I**

For your second quarter project, you will be constructing an aquaponics system to house native fish and feed native riparian plants. Working time for part I of this project will span from [date] until [date, 2 to 3 weeks later]. Part II of this project will extend into [insert time frame].



### Deadlines

- Project Proposals due [date] sent to [teacher]
  - Tank construction starts [date]
- Tank construction finished [date]
- Oral and written data action plan [date]

\*Part II of this project will consist of a full written report as well as a project Reflection\*

We will not have class time to work on this project [dates]. You may have to come in during conference, free periods, or work at home to finish work on time.

Figure 1: Diagram of the nitrogen cycle within an aquaponics tank.

# Project Proposal (25% of grade)

- Instructor will share Project Proposal example/guidelines electronically and on paper on [date].
- Students may submit electronically or on paper.
- Proposals must include: choice of native riparian plant, proof of existence in local riparian habitat (iNaturalist referencing Santa Cruz, Sweetwater, Sabino, etc.), and reference design/schematic for tank.

## Written Data Action Plan (25% of grade)

Class [date] will be the last class before the end of the semester. Your written action plan is due at the end of class today in your notebook. Since this will be an ongoing project, you must make a plan for how you will continue to collect data regarding the health of your ecosystem. You may evaluate this according to the following options:

• <u>Macroinvertebrate study:</u> Consider that ecological health is proportional to the diversity in an ecosystem. You will periodically measure the species richness and abundance of macroinvertebrates in your tank.

- <u>Nitrogen study</u>: Consider the nitrogen cycle. According to the theory of aquaponics, nitrogen must cycle through your tank system in order for your plants to be properly fed. You will periodically measure the nitrogen speciation of your tank.
- <u>Bacteria study</u>: Consider the nitrogen cycle. In order for nitrogen to properly cycle through your tank, there must exist certain bacterial species. Make a plan for how you will quantify bacterial concentration in your tank from week to week.
- **Build your own study:** Have a great idea? Run it by Mr. Kochenderfer first. It must be able to evaluate the health of your ecosystem!

To receive a grade for this section of the project, you must:

- □ Have a draft of the data table you will use to collect data in your notebook. It should include room for 10 weeks of data collection.
- □ Have a written statement for *how* you will collect data—sort of like a rough draft procedure.

#### **Oral Data Action Plan** (25% of grade)

Class [date] will be the last class before the end of the semester. During class today you and your group will have a brief conference with me about your written action plan. Think of this as like the quarter 1 project oral exam. During our conference, you and your group must convince me that you have met the following success criteria:

- □ Knowledge of procedures for data collection.
- □ Knowledges of resources to aid in data collection.
- □ Preparedness for collecting data.

Satisfying these three criteria and a self-assessment will earn you your grade for this section.

#### **Indoor Riparian Ecosystem** (25% of grade)

This grade is easy to achieve. All that is necessary is a:

- Complete, functional aquaponics tank. The tank has plant and fish life introduced as well as conditioned water (bacteria).
- □ Isometric drawing of tank in notebook.



# Scoring Rubric

Student			
Project Proposal	Criteria	Score	Note
	Choice of native plant	/1	
	Proof of existence in riparian habitat	/1	
	Reference design	/1	
	Subtotal	/3	
	Scaled total	/25	
Written Data Action Plan	Criteria	Score	Note
	Draft of data table used to collect in notebook	/1	
	Draft of procedure	/1	
	Subtotal	/2	
	Scaled total	/25	
Oral Data Action Plan	Criteria	Score	Note
	Knowledge of procedures	/1	
	Knowledge of resources/materials	/1	
	Preparedness for collecting data	/1	
	Subtotal	/3	
	Scaled total	/25	
Indoor Riparian Ecosystem	Criteria	Score	Note
	Tank circulates water	/1	
	Fish life introduced	/1	
	Plant life introduced	/1	
	Water conditioned	/1	
	Subtotal	/4	
	Scaled total	/25	