

# Aquaculture

## Unit Outline

1. Project Team Members: Andrew and Melissa Boyer
2. Title of Course: Animal Science (9-12<sup>th</sup> grade)
3. Title of Unit or Project: Aquaculture
4. Approximate length of Unit or Project: 3-4 weeks
5. Brief description of the Unit or Project with an expected final outcome.

This unit will introduce students to aquaculture and its relationship to agriculture. Students will identify advantages and disadvantages to aquaculture that are occurring in today's society by conducting feed efficiency trials, monitoring water quality and by fish dissection.

6. Major Goals of Unit:
  - 1.1 Analyze why the aquaculture industry is growing.
  - 1.2 Explain the biological aspects of fish that give them advantages over other agricultural animals.
  - 1.3 Calculate the feed efficiency of fish.
  - 1.4 Identify the disadvantages of raising fish for profit.
  - 1.5 Distinguish between the ideal conditions for growing warm and cool water fish.
  - 1.6 Explain how the gills of fish take in oxygen.
  - 1.7 Summarize the ways in which oxygen depletion can occur.
  - 1.8 Identify the major factors that affect water quality.
  - 1.9 Identify the major organs systems of the body and the function of each.
7. Sequence of balanced and integrated activities for students:

Students will complete the following activities:

**Feed Efficiency Trial-** Develop a feed efficiency trial by safely catching and weighing a small sample of fish each week. Calculate the feed efficiency to feed at 3% of their body weight.

**Water Quality Testing-** Using a Lamonte freshwater test kit, monitor the major factors that affect water quality. Test for pH, ammonia nitrate, dissolved oxygen and temperature. Compare the test results with the appropriate quantities and make necessary adjustments.

**Fish Dissection-** Identify the external anatomical fins and features of a yellow perch. Dissect the fish to identify the major organs of the circulatory, digestive, and excretory systems. List the functions of those vital organs.

8. Checklist or rubric of assessment components for students:

Three different rubrics are attached to this document.

9. Specific Standards addressed in this Unit or Project:

<u>Ref. #</u>	<u>Name of Standard</u>	<u>Title of Individual Standard</u>
1.1.11E	PA-RWLS	Learning to read independently
1.1.11F	PA-RWLS	Learning to read independently
1.2.11 B	PA-RWLS	Reading critically in all content areas
1.4.11D	PA-RWLS	Types of writing
1.5.11F	PA-RWLS	Quality of writing
1.6.11A	PA-RWLS	Speaking and listening
1.6.11B	PA-RWLS	Speaking and listening
1.6.11D	PA-RWLS	Speaking and listening
1.6.11E	PA-RWLS	Speaking and listening
1.6.11F	PA-RWLS	Speaking and listening
4.1.11C	PA-EE	Watersheds and wetlands
4.2.11C	PA-EE	Renewable and nonrenewable resources
4.4.11A	PA-EE	Agriculture and society
4.4.11C	PA-EE	Agriculture and society
4.4.11D	PA-EE	Agriculture and society
4.6.11B	PA-EE	Ecosystems and their interactions
4.7.11A	PA-EE	Threatened, Endangered, and Extinct Species
4.8.11A	PA-EE	Humans and Environment
4.8.11B	PA-EE	Humans and Environment
	Scans	Reading Writing Listening Speaking Arithmetic/Mathematics Thinking Skills

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Feed Efficiency Trial

	Exceptional	Proficient	Needs Improvement	Unacceptable	Incomplete
	5	4	3	2	1
Handled fish properly					
Correctly used scale					
Calculated feed efficiency					
Maintained accurate records					

Grades according to the following scale:

16-20 = Exceptional

11-15 = Proficient

6-10 = Needs improvement

1-5 = Unacceptable

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Water Quality Testing Rubric

Water Quality Testing	Possible Points	Score
Followed Test Kit Instructions	20	
Monitored and Maintained Water Quality	20	
Maintained Accurate Records	20	
Analyzed Results	20	
Conducted adjustments	20	
Total Possible Points	100	
Any Penalties for safety, etc.	Minus ( )	
Grade according to the following scale: 100-81=exceptional 80-61= proficient 60-41 = Needs improvement 40-21 = unacceptable 20-0 = incomplete Teachers Comments:		

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Fish Dissection Rubric

Fish Dissection	Possible Points	Score
Followed Dissection Instructions	20	
Identified External Anatomy	20	
Located and Identified Internal Organs	20	
States Anatomical Functions	20	
Practiced Safe Laboratory Procedures	20	
Total Possible Points	100	
Any Penalties for safety, etc.	Minus ( )	
Grade according to the following scale: 100-81=exceptional 80-61= proficient 60-41 = Needs improvement 40-21 = unacceptable 20-0 = incomplete Teachers Comments:		