

Unit 3: Fish Anatomy & Husbandry
Aquarium Science
20 Classes

Rev. May 2024

Essential Questions

- How does the anatomy of fish influence their needs and behaviors?
- How can an aquarist tell if their fish is healthy?
- How can an aquarist provide a healthy life for a fish?

Enduring Understandings with Unit Goals

EU 1: There are a variety of common vertebrates that are kept in aquariums, but they each require very specific conditions

- Identify the various vertebrates that are kept in aquariums.
- Evaluate the aquarium conditions that are needed to exist to house vertebrates

EU 2: There are common diseases that fish can contract in an aquarium environment

- Design a quarantine protocol for incoming fish

EU 3: Fish need more than good water quality conditions to be healthy, they also need proper nutrition and enrichment for overall health.

- Create a nutrition meal plan for your organisms within your aquarium.

Standards

Common Core State Standards

- **CCSS.ELA-LITERACY.RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts.
- **CCSS.ELA-LITERACY.RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- **CCSS.ELA-LITERACY.RST.6-8.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

Next Generation Science Standards

- **MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community

Unit Content Overview

- Fish Anatomy**
 - What are the common characteristics fish share?
 - External Environment- what to look at
 - Types of Fins and Mouths
 - How do fish move?
 - Internal Environment - how do fish work?
 - How do fish breathe?
 - How do fish swim?
 - How do fish adapt to their environment?
 - Fish Dissection
- Fish Enrichment
 - Types of Enrichment
 - How to keep your fish happy and healthy
 - Breeding
- Common Fish Diseases
 - How to detect if your fish is unwell
 - Introduction to common fish diseases
 - Treating diseases

Interdisciplinary Connections

- Chemistry-Water Quality
- Biology- Adaptations, Anatomy, Nutrition

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Daily Learning Objectives with *TWPS*

Students will be able to...

- Identify the characteristics common in fish
 - *What characteristics are common in fish?*
- Distinguish between mouth types, body types, and tail types of fishes
- Observe the behaviors of various fish species with one aquarium
 - *What types of behaviors do fish exhibit?*
- Compare and contrast the anatomy of a bony fish and a cartilaginous fish
 - *How are bony fish and cartilaginous fish similar and different?*
- Categorize the behaviors of various fish species and analyze their effect on the rest of the aquarium
 - *What are common behaviors aquarists see in their fish?*
- Identify common diseases that are contracted by aquarium organisms**
 - *What are common diseases when caring for aquatic organisms?*
- Evaluate effective procedures of eradicating diseases in an aquarium
- Research medicines that are commercially available for aquarium organisms
 - *How can you treat a fish that is sick?*
- Compare and contrast the pros and cons of using medicines in an aquarium
- Research the nutritional needs for common aquarium organisms
 - *How can fish be provided a “balanced diet?”*
- Compare and contrast the effect of a fish’s nutritional requirements on the rest of the aquarium
- Research enrichment needs for common aquarium organisms.
 - *How can we keep our fish active and enriched?*

Instructional Strategies/Differentiated Instruction

- Daily Warm Up Activities
- Power Point Lecture with guided note-taking
- Flexible grouping
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Student use of headphones
- Independent reading
- Outlining of text
- Determining central ideas, paraphrasing
- Laboratory Experiences

EL Differentiated Instruction:

- Sentence starters
- Simplified directions
- Prompting and questioning

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- Alternate responses when needed
- Explicit modeling
- Key vocabulary
- Visuals
- Graphic organizers
- KWL charts
- Venn diagram

Glossary

Assessments

FORMATIVE ASSESSMENTS:

- Warm Up Activities
- Daily check-ins with students
- pH water quality check (weekly)
- Temperature and Salinity tests (daily)
- Nitrate, Nitrite, and Ammonia parameter checks (weekly)
- Homework/Reading checks
- Fish Nutrition Plan (EU3)
- Aquarium Spotlight Organism of the Week
- Aquarium Audit (Record Keeping Logs)- ISAAC Teamwork Rubric 3
- Quarantine Procedure Discussion

SUMMATIVE ASSESSMENTS:

- Quiz on EU 1 & 2
- “What is Wrong with my Fish?” Project
 - ISAAC Rubric 4: Problem Solving
- Unit Test (EU1, 2, & 3)

Unit Task

Unit Task Name: “What is Wrong with my Fish?”

Description: Students will use the information learned throughout this unit to diagnose a problem that occurred with a customer’s aquarium. They will apply the skills that they have learned throughout the unit about fish anatomy (EU 1), diagnose a disease (EU 2), and assign proper equipment to manage the given situation (EU3). Students will work individually to solve common

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problems that may arise from maintaining an aquarium. Finally, students will create a presentation that will showcase their solutions to their peers.

Evaluation: ISAAC Rubric 4: Problem Solving

Unit Resources

- Laptop
- Internet Access
- Aquarium Lab