

Unit 3: Fish Anatomy & Husbandry

Aquarium Science Honors

20 Classes
Rev. June 2026

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: Knowing fish anatomy is essential for an aquarist to provide essential care and notice physiological changes in an animal to determine the health and wellness of an animal.

- Understand how fish function in an aquatic environment
- Understand the basic anatomy of a 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.
- Create an enrichment plan for an organism 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 Nutrition
 - Types of food
 - How much food to feed an animal
 - How to feed an organism
- Fish Enrichment
 - Types of Enrichment
 - How to keep your fish happy and healthy
 - Fish Breeding
- Common Fish Diseases
 - How to detect if your fish is unwell
 - Introduction to common fish diseases
 - Treating diseases

KeyTerms and Vocabulary:

Ichthyology, cartilaginous, fishes, vertebrate, gills, operculum, swim bladder, lateral line, scales, cycloid, ctenoid, placoid, ganoid, cosmoid, dorsal, scutes, pectoral, pelvic, caudal, crescent, fork, terminal, superior, inferior, tubular, protruding, respiration, osmoregulation, dissolved oxygen, anterior, posterior,

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ventral, pyloric caeca, adaptation, ampullae of lorenzini, claspers, aerodynamic, heterocercal, buoyancy, oviparous, ovoviviparous, viviparous, fry, emaciation, protein, carbohydrate, nutrition, spawn, enrichment

Interdisciplinary Connections: Language Arts, Mathematics, Science

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

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*
 - *What are the different types of mouths and tails fish have adapted to survive and thrive in their environments?*
 - *What are the different body shapes fish have adapted to survive and thrive in their environments?*
- Distinguish between the different types of fish scales.
 - *What are the types of scales a fish can have?*
- Observe the behaviors of various fish species with one aquarium*
 - *What types of behaviors do fish exhibit?*
 - *How do these behaviors help fish survive in their particular habitat?*
- Identify the external features of a bony fish and explain its function.
 - *What are the common external features of a bony fish?*
- Identify the internal features of a bony fish and explain its function.
 - *What are the common internal features of a bony fish?*
- Compare and contrast the anatomy of a bony fish and a cartilaginous fish
 - *How are bony fish and cartilaginous fish similar and different?*
- Evaluate the husbandry of large cartilaginous species such as sharks and rays.
 - *How do sharks and rays differ in their care in captivity?*
- 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?*
- What are some unique adaptations of fish kept in aquariums?
 - *Why is it important for an aquarist to research an animal before housing it in an aquarium?*
- 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
 - *What are common methods used to treat fish diseases in aquariums?*
- Research medicines that are commercially available for aquarium organisms
 - *How can you treat a fish that is sick?*

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- Research the nutritional needs for common aquarium organisms
 - *How can fish be provided a “balanced diet?”*
 - *Why should we vary our fish’s diet?*
- Research enrichment needs for common aquarium organisms.*
 - *How can we keep our fish active and enriched?*
 - *What can you make to enrich your fish’s environment?*
 - *How can you encourage breeding within an aquarium setting?*

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 direction
- Prompting and questioning
- Alternate responses when needed
- Explicit modeling
- Key vocabulary
- Visuals
- Graphic organizers
- KWL charts
- Venn diagram
- Glossary

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Assessments
<u>FORMATIVE ASSESSMENTS:</u> ● 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 <u>SUMMATIVE ASSESSMENTS:</u> ● Quiz on EU 1 & 2 ● “What is Wrong with my Fish?” Project ● Unit Test (EU1, 2, & 3)

Unit Task
Unit Task Name: “What is the matter with my Fish?” Description: Students will use the information learned throughout this unit to diagnose a problem that occurred with a customer’s animal. They will apply the skills that they have learned throughout the unit to identify the type of animal (EU1), assess the animal’s anatomy to diagnose a problem (EU 2), and assign proper husbandry to manage the given situation (EU3). Students will work individually to solve common problems that may arise from maintaining an aquarium. Finally, students will create a presentation that will showcase their solutions to their peers. Evaluation: Teacher Created Problem Solving Rubric

Unit Resources
● Laptop ● Internet Access ● Aquarium Lab ● Pear Assessment ● Newsela

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