

**Grade Level:**

4

Time:

105 Minutes

Season:

All

Objectives:

Students will be able to...

- Identify a variety of morphological adaptations in fish
- Determine why and how fish are adapted to life in water
- Describe the physical adaptations of salmon that allow them to survive through each life stage

Key Concepts:

- Fish have a variety of physical characteristics that are necessary for them to survive in their aquatic habitat

Salmon Anatomy – Survival Adaptations

Lesson 2 of 2

Background & Summary

This lesson continues to build on the concept of salmon anatomy and dives deeper in the anatomical adaptations that allow salmon to survive in their habitats. This activity will provide the students with the opportunity to recall what they have learned about general fish anatomy. Their knowledge will be further utilized to explore the adaptive details of different fish and then apply those details to salmon.

Procedure

Introduction: What is an “adaptation”?

1. Start a class discussion by asking students to give examples of or describe what they think of when they hear the word “adaptation”. The goal is to develop a collective definition of the word. (2 minutes)

Key message to share with students:

An adaptation is any physical, social, or behavioral characteristic that allows an organism to survive or reproduce in their habitat

2. Continue the discussion by asking students to share adaptations that some species use to survive. Below are examples that can be used to guide the discussion. (3 minutes)

- Tiger in a jungle
 - Stripes for camouflage to break up the shape of its body making them harder to detect
 - Strong jaw muscles for eating through flesh and bones
 - Sharp claws for attacking and killing prey
- Deer in the forest
 - Fur for insulation
 - Specialized stomachs for eating and digesting plant material
 - Large ears for detecting danger
- Raccoon in the city
 - Strong sense of smell for finding food
 - Nimble hands for opening up doors and containers
 - Omnivorous diet for eating both plants and animals

Courtesy of Columbia River FWCO Information and Education, 2022



Procedure (Continued)

Fish Adaptations

Learning objectives:

- a. Fish have a variety of morphologies
 - b. Morphological characteristics are determined by habitat
3. Split students into groups of five. Each group should be assigned a morphology (body shape, tail shape, color patterns, mouth and teeth/gill rakers). There are only five tables so some groups may end up doing the same table if there are more than 25 students in a class. Each student in the group should be given a “Morphology Table Worksheet” that matches the morphology assigned to their group. Instruct students to use their computers to complete the table semi-independently (each student should complete their own table but can work together to discuss possible answers).

The “Morphology Worksheet Answer Key” is a resource for instructors to better assist students. (30 minutes)



Instruction Advice

Some students may not be comfortable using the internet to research a topic. Encourage those students to use sentence starters in the search engine to help get them started. See “Morphology Worksheet Answer Key” for specific search terms that will likely generate an answer

Examples of fish that have [insert morphological feature].

Description of fish that have [insert morphological feature]

4. Call on one or two students from each group to share with the class an adaptation, it’s description and the example. Students should share answers that they filled in, not ones that were already provided. Use the “Fish Morphology Presentation” to review the morphologies that students don’t present. (30 minutes)

Key messages to share with students:

Fish are adapted to their habitat and their morphologies play a critical role in their ability to live and survive in their habitat

The characteristics of plants and animals offer great insight to the physical and biological conditions of the ecosystem.

Time Saver

Save on time by having students complete the “Morphology Table Worksheet” the night before.

Salmon are Built for Survival

Learning objectives:

- a. Each salmon life stage has physical adaptations that help them survive
 - b. Physical adaptations are required for species survival
5. Tell students they will apply what they just learned about fish adaptations to the salmon life stages. Students will work in groups to research ways that each salmon life stage has adapted to survive in their habitat. They will present their findings in a poster and must provide a minimum of two survival adaptations for each life stage (eggs, alevin, fry, smolt, ocean adult and spawning adult). In addition to using their laptops, encourage students to identify adaptations they observe from the “Life Cycle Displays” and “Pacific Salmon Images”.



Procedure (Continued)

Examples of life state specific adaptations are listed on the “Life Stage Adaptation Cheat Sheet”. However, answers will vary, and the cheat sheet provided only has a limited number of answers that are meant to assist students who get stuck.

Below are suggested search engines terms:

How do salmon [insert life stage] survive?

How are salmon [insert life stage] adapted to their environment?

What type of adaptations do salmon have?

Students should draw knowledge from the list of survival adaptations they learned about in the previous activity and their understanding of fish-specific anatomy. (30 minutes)

6. Wrap-up the lesson by having students share out. Use the following prompts to facilitate the discussion. (10 minutes)

- What features stand out to you?
- Which adaptations are the same or similar between life stages?
- Which adaptations are unique to a specific life stage?

Work Smarter, Not Harder

Save time by having each student in a group tackle a different life stage. For groups of five, one student can do both adult stages. For groups of four, group together eggs/alevin and ocean/spawner.

Extensions

Additional Activities

Sound-Off Game

In this activity adopted from a lesson about animal adaptations, students play a game that illustrates the importance of communication as a form of adaptation. This activity can be used in addition to or instead of the warm-up activity described at this beginning of this lesson. Instructions for the Sound-Off game is included in the lesson plan.

Funky Fish Morphology Activity

Students learn about the connection between animal morphology and habitat by using clay to design a fish. The activity was developed by Oregon State University Extension Service. Instructions are included in this lesson plan

Vocabulary

See “Morphology Table Worksheet” for vocabulary that is relevant to this lesson plan.



Materials

Included:

Morphology Table Student Worksheet

Morphology Worksheet Answer Key

Life Stage Adaptations Cheat Sheet

Fish Morphology Presentation

(Optional) Sound-Off Activity. See "Extension" section.

(Optional) Funky Fish Morphology Activity. See "Extension" section.

Request to Borrow from Columbia River FWCO:

Note: Requests are pending availability and geographical location

5 sets – Life Cycle Displays (Laminated)

1 set – Pacific Salmon Images (Laminated)

Not Included:

Markers or color pencils

Projector

Computers connected to Wifi (1 for each student)

5 – 25" x 30" Post-It Notes (or any paper to make a poster)

Next Generation Science Standards

Life Science

LS1 – From Molecules to Organisms: Structures and Processes

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS2-2: Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Common Core Standards

English Language Arts

Reading Standards for Informational Texts

4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.



Common Core Standards (Continued)

4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Writing Standards

4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.

4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research

Speaking and Listening Standards

4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

4.4 Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

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