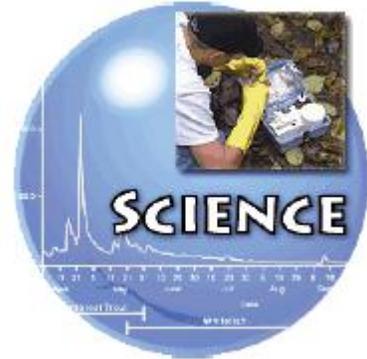


# LESSON 9: GETTING TO KNOW THE SALMONIDS OF THE ELWHA RIVER



## ESSENTIAL QUESTION:

What combination of factors both natural and manmade is necessary for healthy river restoration and how does this enhance the sustainability of natural and human communities?

## GUIDING QUESTION:

Salmonids are a crucial part of the Elwha River ecosystem. How can our understanding of their life cycles help restore the Elwha River ecosystem?

## LESSON OVERVIEW:

Students will be introduced to the wild salmonid species of the Elwha River. After watching a power point presentation on the anadromous life styles of pacific salmonids, students will work in groups to research. Then students will compose a presentation on the lifestyle of a specific species of anadromous fish found in the Elwha River: Chinook, chum, coho, pink, sockeye, steelhead, bull trout, or Dolly Varden. Student groups will then apply their knowledge by constructing a model healthy river habitat in which their species, along with other species of salmon, can grow and thrive.

## TIME:

Three block class periods.

## MATERIALS:

- **Lesson 9- Salmon Anadromous Lifestyles.pptx**
- **Lesson 9- Salmon Anadromous Lifestyles.pdf**
- Reflection Journal pages (Printable handout)
- Vocabulary notes (Printable handout)
- Student pages (Printable handout)
- Research materials/ Internet access
- Power point software / poster boards/ art supplies

## PROCEDURES:

1. Remind students of the essential question and introduce the guiding question.

2. Hand out the first reflection journal page. Have students take a couple of minutes to answer the reflection journal questions. Questions they generate can add to their research.
3. Hand out the vocabulary notes page. Have students take notes on the important vocabulary while watching the power point.
4. Review the vocabulary.
5. Divide students into groups and assign each group a salmon species to research.
6. Hand out the student pages and go over the expectations for the research project.
7. Give students computer or library time to work on research
8. Provide materials and time for presentation.
9. Students present their research to the class.
10. Using their own research and the research of other groups, have students create a model of a healthy river ecosystem for Elwha fish. This can be a computer simulation, a diorama, a poster, a play, a travel brochure for salmon, a comic book, let the students be creative.
11. Hand out the second Reflection Journal Page. Give students time for a final reflection the lesson.

#### **ASSESSMENTS:**

- Reflection journal pages. See rubric.
- Research project based on the student page guidelines. See rubric.
- Assess River habitat project using rubric provided.

#### **ADDITIONAL RESOURCES AND ENRICHMENT:**

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##### **FOR STRUGGLING LEARNERS;**

Salmon coloring book visually and simply explains salmon life cycles.

<http://www.fws.gov/pacific/publications/salmbk.pdf>

The Lesson plan in the link below contains a “Something Fishy: Life Cycle of a Salmon Game”

<http://www.eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Animals/ANM0204.html>

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##### **ENRICHMENT:**

Explore the shellfish associated with the Elwha River:

<http://www.nwifc.org/2008/10/collaborative-efforts-for-elwha-river-freshwater-mussel-rescue/>

<http://www.elwhainfo.org/elwha-river-watershed/nearshore/nearshore-overview>

<http://adventure.howstuffworks.com/outdoor-activities/fishing/freshwater-tips/salmon/salmon-spawn.htm>

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JUST FOR FUN:

Salmon dissection game <http://library.thinkquest.org/05aug/00548/Dissection.html>

Coloring, Mazes, dot-to-dot fin stuff

[http://www.critfc.org/kids/activity\\_book.pdf](http://www.critfc.org/kids/activity_book.pdf)

Many salmon games

<http://library.thinkquest.org/05aug/00548/GoodStream.html>

## WASHINGTON STATE STANDARDS:

### SCIENCE

1. **EALR 4: 6-8 LS3A** The scientific theory of evolution underlies the study of biology and explains both the diversity of life on Earth and similarities of all organisms at the chemical, cellular, and molecular level. Evolution is supported by multiple forms of scientific evidence.
  - a. Explain and provide evidence of how biological evolution accounts for the diversity of species on Earth today.
2. **EALR 4: 6-8 LS3E** Adaptations are physical or behavioral changes that are inherited and enhance the ability of an organism to survive and reproduce in a particular environment.
  - a. Give an example of a plant or animal adaptation that would confer a survival and reproductive advantage during a given environmental change.
3. **EALR 4: 6-8 LS2D** Ecosystems are continuously changing. Causes of these changes include nonliving factors such as the amount of light, range of temperatures, and availability of water, as well as living factors such as the disappearance of different species through disease, predation, habitat destruction and overuse of resources or the introduction of new species.
  - a. Predict what may happen to an ecosystem if nonliving factors change (e.g., the amount of light, range of temperatures, or availability of water or habitat), or if one or more populations are removed from or added to the ecosystem.
4. **EALR 4: 6-8 LS2E** Investigations of environmental issues should uncover factors causing the problem and relevant scientific concepts and findings that may inform an analysis of different ways to address the issue.
  - a. Identify resource uses that reduce the capacity of ecosystems to support various populations.

### READING

1. **EALR 1:** The student understands and uses different skills and strategies to read.
  - a. Integrate new vocabulary from informational/expository text and literary/narrative text, including text from a variety of cultures and communities, into written and oral communication.
2. **EALR 2:** The student understands the meaning of what is read.
  - a. **Component 2.2** Understand and apply knowledge of text components to comprehend text.

- b. **Component 2.3** Expand comprehension by analyzing, interpreting, and synthesizing information and ideas in literary and informational text.

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## WRITING

1. **EALR 1:** The student understands and uses a writing process.
  - a. **Component 1.1** Prewrites to generate ideas and plan writing.
  - b. **Component 1.5** Publishes text to share with audience.
  - c. **Component 1.6** Adjusts writing process as necessary.
2. **EALR 2:** The student writes in a variety of forms for different audiences and purposes.
  - a. **Component 2.1** Adapts writing for a variety of audiences.
  - b. **Component 2.2** Writes for different purposes.
  - c. **Component 2.3** Writes in a variety of forms/genres.
3. **EALR 3:** The student writes clearly and effectively.
  - a. **Component 3.1** Develops ideas and organizes writing.
  - b. **Component 3.2** Uses appropriate style.

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## SOCIAL STUDIES

1. **EALR 5:** The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.
  - a. **Component 5.2** Uses inquiry-based research

## VOCABULARY :

- **Alevin** (*al-uh-vuh n*) A newly hatched fish in the larval stage, which remain in the redd area and feed off their yolk sac.
- **Anadromous-** (*[uh-nad-ruh-muh s]*) A fish that is born in freshwater, migrates to the ocean to spend its adult life, and returns to freshwater to spawn.
- **Fry-** A juvenile fish that has absorbed its yolk sac and begins to hunt or feed on its own.
- ***Oncorhynchus*** (*on-kor-IN-cus*) – Latin name for the genus that includes salmonids
- **Redd-** A depression in sand or gravel where salmon deposit their eggs and then partially bury them.
- **salmonids** (*sal-MON-ids*) – salmon and the other species related to them, such as trout and whitefish.
- **Smolt-** A juvenile fish (for salmon, the stage where they enter salt water).
- **Spawn -** The process by which an organism produces others of its kind.



**Elwha River Restoration  
Getting to Know the Salmonids of the Elwha River  
Vocabulary Notes**

**Alevin** (*al-uh-vuhn*):

**Anadromous** (*[uh-nad-ruh-muhs]*):

**Fry:**

**Redd:**

**Smolt:**

**Spawn:**



**Elwha River Restoration**  
**Getting to Know the Salmonids of the Elwha River**  
**Reflection Page 1**

Discuss ways in which you have encountered salmon in your life? Why do you think salmon are important to the restoration of the Elwha River?

What questions do you have about salmon?



**Elwha River Restoration**  
**Getting to Know the Salmonids of the Elwha River**  
**Student Page**

**YOUR TASK :**

You and the members of your group will collaborate to discover everything you can about the life of the salmonid species you have chosen or been assigned, then as expert **ichthyologists**, you will present your discoveries to the class using a power point presentation or a poster.

**THE PRESENTATION MUST INCLUDE THE FOLLOWING:**

- Salmonid's scientific name (genus and species).
- Salmonid's common name(s).
- Where salmonid is born and what its eggs look like.
- What the fish looks like and does as it grows and changes (What role does it play in its ecosystem?)
- Show how their habitat differs as they grow and change.
- Show how other organisms (animals, insects, plants, humans) interact with the salmon as they grow and change.
- Describe the salmonid's life cycle;
  - Where do they go when they leave the place they are born?
  - Where they go and how long they stay at each leg of their travels? ( this would be a good time to use the word anadromous)
  - Where do they go when they are ready to spawn?
  
- If your salmonid is a trout or char, show how it is different from a salmon.
- If your samonid is a salmon, show how it is different from a trout or char, and other salmon.
- At least three additional interesting discoveries about your fish. (e.g. what its name means)
- Salmonid specific vocabulary ( use your vocabulary notes)

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#### YOUR PRESENTATION MUST BE:

- Edited for spelling and grammar.
- Well-organized, clearly understood.
- Neat
- Interesting to look at and listen to.

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#### YOU MUST DEMONSTRATE THAT;

- You understand the life cycle of the salmonoids and their environmental needs.
- You understand the role of salmonids and how they interact with other organisms in an environment.
- You understand that your salmonid is different from other salmonids.

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#### TIPS TO MAKE YOU RESEARCH FUN:

1. Entering "Pacific wild salmon" into a web search engine will give a great deal of information.
2. Refine your search by scrolling to the bottom of the page and entering your specific salmonid into the "Search within Results" section.
3. Go to the National Park Service Elwha Restoration web page to find a fabulous library of photographs.
4. Check these out
  - <http://wdfw.wa.gov/outreach/fishing/t&sid.pdf>
  - [http://wdfw.wa.gov/fish/identification/pac\\_salmon\\_id.pdf](http://wdfw.wa.gov/fish/identification/pac_salmon_id.pdf)
  - <http://animals.howstuffworks.com/fish/salmon-info.htm/printable>



**Elwha River Restoration  
Getting to Know the Salmonids of the Elwha River  
Reflection Page 2**

What new discoveries have you made about salmonids and how can this understanding help you to be involved in restoring the Elwha River ecosystem?

What new questions do you have based on your discoveries?



**Elwha River Restoration**  
**Getting to Know the Salmonids of the Elwha River**  
**Student Page**

**YOUR TASK -**

Now that you and your group have become experts on your particular salmonid, your task is to use your research and the research of other groups in your class to produce a healthy river ecosystem for your Elwha salmonid as well as all the other salmonids.. You may create a diorama, a computer simulation, a play, a comic book, a travel brochure -what ever is reasonable – be creative- to demonstrate the Elwha River Salmonid's needs.

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**YOUR PROJECT MUST INCLUDE REPRESENTATIONS OF:**

- What your fish need to thrive (food, shelter, water) through all stages of their early river life. (egg, Alvin,fry, smolt).
- What adult fish need in order to spawn.
- The season(s) in which your fish is born, grows and returns to spawn.
- Things that are needed in the surrounding environment for a healthy salmon river.

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**YOUR PROJECT MUST BE:**

- Well-organized
- Neat
- Interesting to look at

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**YOUR PROJECT MUST DEMONTSTRATE:**

- You know how the salmonids in the Elwha River interact with and respond to their environment and other organisms.
- You understand the needs of salmonids in a healthy river environment.

## REFLECTION JOURNAL RUBRIC

### **Outstanding response (4)**

An outstanding reflection journal response is an original, thought-provoking response to the questions raised in the prompt. It contains specific examples from both the student's experiences as well as the classroom material whenever possible. It asks original, provocative, relevant questions. It is also virtually free of grammatical errors.

### **Above-average response (3)**

An above-average journal thoroughly addresses the questions raised in the prompt. It contains specific examples from both personal experiences as well as the classroom material whenever possible. It asks provocative, relevant questions. It may contain some minor grammatical errors.

### **Average response (2)**

An average journal competently addresses the issue raised in the prompt. It contains some examples from both personal experiences as well as the classroom material whenever possible. It asks relevant questions. Grammatical errors may be present, but they will not impede the reader from understanding the context of the sentences.

### **Below-average response (1)**

A below-average journal does not competently address the issue raised in the prompt. It contains few examples from personal experiences or the classroom material. It asks easy questions. Grammatical errors are so rampant that they impede the reader from understanding the context of the sentences.

### **Failure to respond to the assigned prompt (0)**

A failing journal does not address the issue raised in the prompt at a middle school level. It contains very few examples of personal experiences as well as classroom material, or the student fails to respond at all. Grammatical errors are so rampant that they impede the reader from understanding the context of the sentences.

## **Getting to Know the Salmonids of the Elwha River Research Project Rubric**

### **Outstanding response (4)**

Addresses all requirements and includes many other interesting facts from multiple sources of relevant information. Presents easy-to-follow steps which are logical, graphics are meaningfully detailed. All grammar and spelling are correct. Word processed or hand-written sections are clean and neat with illustrations provided. The layout is visually pleasing and contributes to the overall message. The group demonstrates a thorough understanding of their salmonid's life cycle, role and interactions in the environment, plus differences among members of the species. The oral presentation is enthusiastic, confident, organized and interesting. All group members have contributed in some way.

### **Above-average response (3)**

Addresses all but one requirement and includes a few other interesting facts from multiple sources of relevant information. Most of the steps are logical, graphics are meaningful. Only one or two spelling or grammar errors. Word processed or hand-written sections are clean and neat with illustrations provided. The layout is nice and contributes to the overall message. The group demonstrates some understanding of their salmonid's life cycle, role and interactions in the environment, plus differences among members of the species. The presentation is mostly organized and interesting. Most group members have contributed in some way.

### **Average response (2)**

Addresses most requirements. Some of the steps are understandable; most are confusing and lack detail. More than two spelling or grammar errors. Word processed or hand-written sections are smudged or haphazard, illustrations are haphazard. The layout shows some structure, but appears cluttered and busy or distracting, or has large gaps of white space. The group demonstrates little understanding of their topic. . The presentation is unstructured and dull. Few group members contribute.

### **Below-average response (1)**

Failed to identify relevant requirements. Not sequential, most steps are missing or are confusing Very frequent grammar and/or spelling errors. Word processed or hand-written sections are dirty and haphazard. The layout shows little structure and is cluttered or too sparse. The group demonstrates no understanding of the topic. The presentation is random and dull. The group did not work well together.

### **Failure to respond to the assigned prompt (0)**

No effort was made to identify relevant requirements. Presentation and research was either left unfinished or not attempted at all

## **Getting to Know the Salmonids of the Elwha River Healthy River Ecosystem Project Rubric**

### **Outstanding response (4)**

The project includes all required elements as well as additional information. Student can accurately answer all questions related to facts in the project. Several of the elements used reflect an exceptional degree of student creativity in their creation and/or display. The project is exceptionally attractive in terms of design, layout, and neatness. There are no grammatical or spelling mistakes in the project. Student or group used time well during each class period and focused on getting the project done.

### **Above-average response (3)**

All required elements are included in the project. Student can accurately answer most questions related to facts in the project. One or two of the elements used reflect student creativity in their creation and/or display. The project is attractive in terms of design, layout and neatness. There is one grammatical or spelling mistake in the project. Student or group used time well during each class period and usually focused on getting the project done

### **Average response (2)**

All but one of the required elements are included. The elements are made by the student, but are based on the designs or ideas of others. Student can accurately answer about 75% of questions related to facts in the project. The project is acceptably attractive though it may be a bit messy. There are two grammatical or spelling mistakes in the project. Student or group used some of the time well during each class period there was some focus on getting the project done.

### **Below-average response (1)**

Several required elements were missing. Student appears to have insufficient knowledge about the facts in the project No graphics made by the student are included. The project is distractingly messy or very poorly designed. It is not attractive. There are more than two grammatical or spelling mistakes in the project. Did not use class time to focus on the project OR often distracted others.

### **Failure to respond to the assigned project (0)**

Only on or two elements were attempted and left unfinished, or no attempt was made at all. Did not use class time to focus on the project or often distracted others.