How to Grow Fish
Cómo Cultivar Peces
K-5th Grade

Themes: Aquaculture, Washington History

Location:
Check to see if your local state hatchery is open and take your students on a field trip. This will help them see the process in person. We recommend going in the fall or the spring. The lesson can be taught in the classroom.

Remote learning modification: Hatcheries are currently closed due to COVID-19. The lesson can be taught over Zoom or Google Classrooms.

Standards:
NGSS

3-LS4-4

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

CCSS

ELA-LITERACY.W.5.3

Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

Washington OSPI

ESE Standard 1

Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, tribal, and global levels.

H4.4.1

Recognize and explain significant historical events in Washington state that have implications for current decisions.

Objectives:
Students will..

1. Recall how early European settlers impacted both the Indigenous peoples of Washington, as well as the fish.
2. Explain why hatcheries began and the role they play in our state today.
3. Illustrate the history of Washington hatcheries by creating a short play with their classmates.
4. Develop a short story about the role hatcheries play in Washington's environment, economy and cultural systems in Washington.

Modifications, Adaptations:
For COVID-19 distance learning, or other remote learning modification, look for **remote learning modifications** throughout the lesson plan.

This lesson also has materials available in Spanish.

K-2 adaptation: This lesson can be adapted to teach kindergarten through second grade students as well. Adaptations for these grades are built in to this lesson plan.

NGSS

K-ESS3-3

Communicate solutions that will reduce the impact of humans on land, water, air, and/or other living things in the local environment.

CCSS

ELA Literacy W.2.3

Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.

Washington OSPI

H3.1.2

Explain how the actions of people in the past influence us today.

Materials:
WDFW History of Hatcheries PowerPoint, History of Hatcheries reading sheet, ThingLink hatchery virtual tour in English or Spanish, Managing for Fish and Fisher PDF, Working in a Hatchery PDF.

Vocabulary:
English

Aquaculture: The rearing of aquatic animals or the cultivation of aquatic plants for food.

Fertilize: Mix sperm and eggs. One sperm unites (fertilizes) one egg to create a complete set of genetic instructions (genes).

Genetic: A unit of inheritance which is transferred from a parent to offspring and determines some characteristic of the offspring.

Salmonid: A fish of the salmon family.

Spawning: To release or deposit eggs.

Stewardship: Then act of taking care of something, such as an organization or place.

Stock: A group of fish of the same species that live in the same geographic area and mix enough to breed with each other when mature.

Subsistence: The resources needed for survival.

How to Grow Fish

K-5th grade

Vocabulary:

Spanish

Acuacultura: La crianza de animales acuáticos o el cultivo de plantas acuáticas para alimento.

Fertilizar: Mezclar espermatozoides y óvulos. Un espermatozoide se une (fertiliza) a un óvulo para crear un conjunto completo de instrucciones genéticas (genes).

Genética: Unidad de herencia que se transfiere de un padre a sus hijos y determina algunas características de su descendencia.

Salmónido: Un pez de la familia del salmón.

Desove: Liberar o depositar huevos. Administración: el acto de cuidar algo, como una organización o un lugar.

Población: Un grupo de peces de la misma especie que viven en la misma zona geográfica y se mezclan lo suficiente como para reproducirse cuando crecen.

Subsistencia: Los recursos que se necesitan para sobrevivir.

Procedure:

Introduction to hatcheries in Washington
Read, "Putting on Salmon Eyes" (page 11) from the "One with the Watershed" curriculum. Tell students that throughout their hatchery and history journey to remember to wear Salmon Eyes, they might see things a little differently!

Before beginning lesson, ask students to raise their hand if they have ever heard of, or been to a fish hatchery. If any students have, ask them what fish hatcheries do. If they visted a fish hatchery, ask them to describe their experience; What did they see? How did it smell? What was one thing that stuck out to them? Write themes or ideas on a whiteboard. If students have never heard of a hatchery, have them try and guess what a fish hatchery might do based on the name. Have students think about this for one minute, then pair with a partner and share their idea. After sharing ideas with a partner, have students share ideas as a class.

Inform students they will be learning about the history of fish hatcheries and learning about the role they play today. Open the WDFW Historical Hatcheries PowerPoint and accompanying text PDF. You will read through the history of hatcheries in Washington. The PDF signals you when to change slides. Vocabulary words are bolded in the PDF. You will want to introduce these vocabulary words as you come across them. You can have students try and guess their meaning using context clues if time allows. Encourage students to take notes as they will need to remember what they learned for their next activity.
Remote learning modification: You can read the story and share the slides over Google Classrooms or Zoom.

After you've read through the PowerPoint story, pair students into small groups. Tell them they are going to create a three to five-minute play that tells the story(ies) of hatcheries in Washington, and how hatcheries have played a role in supporting today's jobs, outdoor recreation and ecosystems. You may want to write vocabulary words on a whiteboard or provide students with a list of words.
Remote learning modification: Break students into groups using breakout rooms on Zoom or Google Classroom.

Their play must address:
- How European settlers impacted Indiegnous peoples in Washington.
- How European settlers approached Washington's fish stocks.
  - Consider fish populations, environmental conservation, etc.
- Why there was a need for fish hatcheries in Washington.
- How do the decisions of early settlers impact the peoples of today?
  - Less fish for people, degraded ecosystems, etc
- How might the ecosystem change if salmon were to go extinct?
- According to the PowerPoint, why are hatcheries important in today's modern world?

You can give students the PowerPoint if they need to review slides. You can also give them historical resources from the "additional resources" section of the lesson plan.
Have students present their plays and provide feedback as necessary. **Remote learning modification:** check out this resource for doing skits over Zoom.

K-2 adaptation: Use the WDFW PowerPoint K-2 History of Hatcheries and K-2 History of Hatcheries reading sheet. Go through the PowerPoint slowly (should take about 10 minutes).

Ask students what they notice about the photos along the way. How does life in the 1800s look different from life today? Are there any ways it was similar? After you have finished the PowerPoint, ask students if there is anything else they want to know about hatcheries or salmon. Write student "wonders" on a whiteboard.

Pair students into small groups (3-4). Tell them they are going to create a short play about the history of salmon and /or Indigenous peoples in Washington and how this You can give them the following prompts to help them get started:

- How many salmon were in rivers before Europeans came to Washington?
- What happened to Indigenous peoples after Europeans arrived?
- What happened to salmon when Europeans began to make money from catching them?
- How did people solve the problem of salmon loss?
- What role do hatcheries play today?

Give students 3-5 minutes to create their play, then have students present their play to the class.

Today's hatcheries
On their own, have students explore the interactive tour of WDFW hatcheries. In this exhibit, students will learn how biologists and fish managers spawn and release salmon and trout. They will look at pictures and watch videos to supplement the learning. Encourage students to take notes as this interactive exhibit can be used as a source for the story they will create.

Afterward have students read the short piece, "Managing for Fish and Fisher". This PDF gives insight to some of the complexities that hatchery managers consider when raising fish.

After reviewing these sources, have students complete the

activity sheet, "Working in a Hatchery". This activity sheet addresses challenges and opportunities that hatcheries workers encounter.

K-2 Adaptation: Have students explore the virtual exhibit in three different class periods. After each exhibit, have a class discussion about what they learned. Instead of the "Managing for Fish and Fisher", read the story, "When the Salmon Went Away" (pages 12-16 in the One with the Watershed Curriculum). Remind students to put on Salmon Eyes (you may want to have them remind you why salmon eyes are important). After you're done reading the story ask the students:

1) Why did the salmon go away?
2) Who are the four helpers?
3) What lessons did the humans learn?
4) How is this story different to the historical PowerPoint story? How is it similar?

Final review and creating a story

Play this Kahoot game with the students as a quick review to what they have learned. Share this link with them to begin.

Using sources from the previous activities, students will write a short story about the role which hatcheries play: 1) in the environment 2) in the economy 3) in their culture.

Students may use outside sources, but they should cite them at the end of their story. The story should have a clear narrative. This resource may help students outline their story with a narrative (characters, setting, beginning, middle, end, etc.). Students may also draw illustrations which help visualize their story.

Their story can be based on real-life, history, facts or can be made up. It must, however, address the four elements listed above.

K-2 Adaptation: Have students write a short story about salmon. Their story should include: why the salmon disappeared, what role humans had/have in salmon disappearing, and how humans can help the salmon return.

Idea: Show off your students' work! Share student projects from this lesson with WDFW.
Facebook:@WashingtonFishWildlife
Instagram:@TheWDFW
Twitter:@WDFW
#WildWashington #WildWa

Did you teach this lesson? Give us your feedback.

Additional Resources :

We encourage you to use the following resources as either a supplement to this lesson, or to share the resources with students for their project.

Supplemental activities:

- The salmon lifecycle activity-WDFW
- The salmonid lifecycle-WDFW/Issaquah Salmon Hatchery
- Glossary of hatchery definitions- WDFW
- Preparing for a hatchery visit information/activities-WDFW/ Issaquah Salmon Hatchery
- After the hatchery visit activity book-WDFW

Historical information:

- History of Leavenworth fisheries complex-United States Fish and Wildlife Service-USFWS
- A brief history of salmon fishing in the Pacific Northwest-Mid Sound Fisheries
- Hatcheries-Northwest Power and Conservation Council

Videos

- Tour of Puyallup Hatchery-WDFW
- Ringold-Meseberg Hatchery-WDFW
- Opening Day Fishing in Washington- The Hatchery Component- WDFW
- Naches Trout Hatchery-WDFW
- Salmon Hatcheries: Washington State- Washington RCO
- State of Salmon: Restoring a Washington Icon: Washington RCO

More information:

- School Cooperative Program (salmon)-WDFW
- Mass marking-WDFW