North Olympic Watershed Science

Dungeness River Field Study

Name: _______________________

Date: ________________________

This program is funded by NOAA B-WET
Outline of Dungeness River Field Study

Watch.....

Episode 1: Watershed Science
   What is a Watershed?

   Review and complete pages 3-7

Episode 2B: Watershed Science
   Getting to Know Dungeness River

   Complete pages 8-11

Episode 3B: Watershed Science
   360 Exploration of
   Habitat at Dungeness River

   Complete pages 12-13

Episode 4B: Watershed Science
   Dungeness River
   Aquatic/Water Insects

   Complete pages 14-16

Episode 5B: Watershed Science
   What does our Dungeness River data tell us?

   Follow along to fill in page 17
   Then complete page 18

Episode 6: Watershed Science
   Stewardship in Action

   Complete pages 19-21
Pacific Salmon Species

- **Chinook**: Largest of the Pacific salmon. Average weight 12-24 pounds, average length 36-58 inches, and lifespan of 4-8 years.

- **Chum**: Average weight 9-15 pounds, average length 25-40 inches, and lifespan of 3-5 years.

- **Coho**: Average weight 6-12 pounds, average length 24-38 inches, and lifespan of 3 years.

- **Sockeye**: Average weight 4-8 pounds, average length 25-33 inches, and lifespan of 4 years.

- **Pink**: Smallest of the Pacific salmon. Average weight 2-5 pounds, average length 20-30 inches, and lifespan of 2 years.
Salmon is a key species in both aquatic (water) and terrestrial (land) food webs. Over 130 animals depend on salmon to survive! Trees that grow along rivers with active salmon runs will grow bigger and faster than trees that grow along rivers without salmon. Predators and scavengers will drag salmon into the forest. As the salmon decay they add nutrients, such as nitrogen, to the soil.

Can you add an animal to the salmon food web?

Hint: The arrow shows the energy transfer. The arrow will point towards the animal doing the eating (the predator).
What is a Watershed?

**Watershed**: An area of land that drains to a larger body of water, such as a lake or ocean. Most watersheds are named after the major river or lake within it’s boundaries. Other times, watersheds are named after the receiving body of water, such as the Strait of Juan de Fuca Watershed.
What is a Watershed: Watersheds of the North Olympic Peninsula

Map Key
- Mountain
- Lake
- River
- International Boundary
- Road
- City

[Map of the North Olympic Peninsula showing various watersheds and key locations]
Getting to Know Your Watersheds

1. What are the two largest lakes on the map?
___________________________________________________________________________________

2. How many watersheds does Highway 101 (HWY 101) not pass through on this map?
___________________________________________________________________________________

3. What watershed is Peabody Creek in on this map?
___________________________________________________________________________________

4. What watershed is Mt. Olympus in? How tall is Mt. Olympus?
___________________________________________________________________________________

5. What river flows from Lake Crescent to the Strait of Juan de Fuca?
___________________________________________________________________________________

6. What three rivers flow into the Quilayute River?
___________________________________________________________________________________

7. What landform causes the North Olympic Peninsula to have so many watersheds?
___________________________________________________________________________________

8. What watershed is your school in?
___________________________________________________________________________________
Getting to know the Dungeness Watershed.....

*Fill in the blank, using the words from the word bank below.*

___________are the source of the river, it is where the river begins.

A _______________is a river that flows into a larger river.

_________is the largest tributary of the Dungeness River.

The forest that borders the river is called the __________ zone.

The __________is where the river pours into a larger body of water.

**Word Bank**

tributary  riparian  mouth  headwaters

Gray Wolf River
Label the headwaters, a tributary, and the mouth on the map.
Practice Thinking Like a Scientist....... 

What are 3 questions you have about the Dungeness River based on the observation that *salmon numbers are decreasing*?

1) 

2) 

3)
Find an object, something from inside your house or something you found outside. Sit with your object and look closely.

*What do you observe about your object? (I notice....)*

*What questions do you have about your object? (I wonder...)*

*What connections can you make about your object? (It reminds me of...)*

**Fill in the boxes below....**

<table>
<thead>
<tr>
<th>I notice....</th>
<th>I wonder....</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>It reminds me of....</th>
<th>Sketch your object.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
Observations on the Dungeness...  

**What did you notice that would make good habitat for salmon?**  
(check all that you see from the 360 video, and in the lines below explain why you think seeing these things might be a good, or bad, sign for salmon.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallen logs</td>
<td></td>
</tr>
<tr>
<td>Trees &amp; shrubs</td>
<td></td>
</tr>
<tr>
<td>Predators</td>
<td></td>
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<tr>
<td>Clear Water</td>
<td></td>
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<tr>
<td>Ripples</td>
<td></td>
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<tr>
<td>Pools</td>
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</table>

**Other observations:**

__________________________________________________________________
__________________________________________________________________
Observations on the Dungeness...

Draw an example of a healthy river habitat for salmon....

Describe your drawing:

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
What life in the water can tell us...

Continuing on our mission to answer the question, “Is the Dungeness River at Railroad Bridge Park Healthy Habitat for salmon?” we are now going to try to better understand how clean the water is.

Brainstorm...

What are 3 different types of pollution that could make it into the Dungeness River?

1) 

2) 

3) 

How can we test for pollution that we cannot see?

_____________________________________________________________________________

_____________________________________________________________________________

________________

What is an indicator species?

_____________________________________________________________________________

_____________________________________________________________________________

________________________
List 3 different species that we could find that would be a **good sign** of a healthy river.

1) 
2) 
3)
Practice Finding the Differences..

In (Episode 5) you will learn how to identify different macroinvertebrates.

Mayflies and stoneflies can look a lot alike when you don’t know what you are looking for.

Let’s practice finding the differences between them.

Circle as many differences in the two pictures as you can.

Drawing can help us get to know the details of a specimen. Practice drawing a Mayfly and a Stonefly in the boxes below.

Mayfly

Explain 3 differences between Mayflies and Stoneflies

1) 

2) 

3)

Stonefly
Let’s sort and count our sample...

*Fill out the chart as you follow along in the video.....*

<table>
<thead>
<tr>
<th>Mayfly</th>
<th>Stonefly</th>
<th>Caddisfly</th>
<th>Other Fly Larvae</th>
<th>Aquatic Worm</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Challenge!** Can you follow along in the video and try to make your own bar graph to represent your data?
Conclusion

Claim: Based on your observations and survey results, what claim can you make about the health of the Dungeness River in Railroad Bridge Park for salmon? (Is the Dungeness River in RRBP healthy or unhealthy for salmon?)

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

Evidence: What evidence do you have to support your claim? (Include observations and data collected)

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

What are some other things that we did not test for that could be affecting salmon populations? What would you test if you were to ask the question again?

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
Student Stewardship:

Brainstorm Solutions

How can students make a difference?

How can you help salmon?
THREATS TO SALMON

WATER SCARCITY
Drought, population growth, increased water use, and irrigation have depleted water supplies in many regions. Less water makes it difficult, and sometimes impossible, for fish to migrate and spawn.

BARRIERS TO PASSAGE
Barriers, such as dams, may block their passage and create slow-moving pools that are ideal for predators.

WARMING WATER
Climate change, dams, and industrial discharge can increase water temperature. Water warmer than 64°F/18°C makes salmon more susceptible to predators, parasites, and disease.

NATIVE PLANT LOSS
Without native plants, fish are more vulnerable to predation and warming waters. Native plants also provide habitat for the invertebrates that salmon eat.

RUNOFF
Animal wastes, pesticides, and other pollutants runoff from lawns and farms. Oil, heavy metals, and antifreeze runoff from roads. When they reach rivers and streams, these pollutants kill fish, stunt their growth, and impede their reproduction.

OVERFISHING AND BYCATCH
Historically, many salmon populations were overfished. Today, endangered and threatened salmon can accidentally be caught by people fishing for other types of fish.

HOW YOU CAN HELP

BE WATER WISE
Use less water for cleaning, flushing, and showering; replace your lawn with native, drought-resistant plants and water them early in the day; eat less meat and dairy products; and reuse greywater.

CONSERVE ELECTRICITY
Turn off lights and electronics when not in use and unplug unused electronics. Using less electricity decreases the demand for dam-generated electricity.

CUT YOUR CLIMATE CHANGE FOOTPRINT
Rethink and reduce purchases; reuse products and packing before throwing them out; compost and recycle when possible; and bike, bus, and carpool.

RESTORE HABITAT
Volunteer with your local stream team or green team to plant native species, clean up litter, remove invasive species, and create rain gardens.

MINIMIZE RUNOFF
Use fewer pesticides, fertilizers, and household chemicals; dispose of pet waste properly; wash your car at commercial car washes; and maintain your vehicles.

EAT SUSTAINABLE SEAFOOD
Visit FishWatch.gov to learn how to choose seafood with a smaller impact on the environment.

Learn what salmon need to live, and how you can make a difference.

NOAA FISHERIES
U.S. Department of Commerce | National Oceanic & Atmospheric Administration National Marine Fisheries Service
Salmon Steward

Pledge made by:

To protect my watershed for salmon...

I pledge to...

On This Day