



Salmon Senses

For the Wetlands Wagon Classroom Program

20 Minutes

Objectives:

1. To determine what characteristics a fish has
2. To identify the stages of a salmon life cycle
3. To role play and explain how a salmon finds its way back to its home river for nesting: through smell
4. To explain how water quality affects the salmon

Materials:

Part A: What Makes a Fish a Fish?

- Fabric Salmon Model

Part B: Salmon Life Cycle

- Images of Salmon Life Cycle

Part C: Salmon Redd (nest) Demo

- Clear Container
- River Rocks
- Orange Beads- salmon eggs
- Child's Swim Flipper- salmon tail fin

Part D: Follow Your Nose Home

- Putah Creek Card Label
- American River Card Label
- Sacramento River Card Label
- 6 Bottles with 2 sets of three different scents inside: Options- Vanilla, Lemon, Licorice, Fennel, Almond
- Coffee Beans container to desensitize noses to scents

Preparation/Set-up:

1. Place the materials above in groups in the order of the parts of the lesson, so you can move down the line to each lesson part as you go.
2. Part C: Salmon Redd Demo
 - a. Place the rocks into the clear container.
 - b. Keep the beads (eggs) and swim flipper (tailfin) nearby for use during the demo procedures.
3. Part D: Follow Your Nose Home

- a. Place the River Card Labels in order from Left to Right: Putah Creek, Sacramento River, American River since Putah Creek flows in the Sacramento River from the West and the American River flows into the Sacramento River from the East.
- b. Place one scent bottle with each waterway. For example, place the almond bottle on the Putah Creek Card, place the fennel bottle on the Sacramento River Card, and the lemon bottle on the American River Card
- c. Place the other 3 matching scent bottles off to the side, so the students do not know which of those bottles matches which river scent.

Key Vocabulary Words:

- ✓ Adaptation- A trait of a living thing's body or a behavior that helps it to survive
- ✓ Alevin- the second stage of a salmon's life cycle, where the yolk sac is attached to its body
- ✓ Anadromous- able to move from freshwater where born to salt water for adult part of life
- ✓ Brackish- a mixture of salt and fresh water
- ✓ Fish- an animal that has gills to breathe under water, vertebrae, fins, scales and a lateral line
- ✓ Fry- the third stage of a salmon's life cycle, where it is feeding on its own
- ✓ Habitat- the place or area that an animal lives
- ✓ Redd- Salmon nest
- ✓ Smolt- the fourth stage of a salmon's life cycle, where the body adapts to brackish water and then to salt water
- ✓ Tributary- a flowing body of water that feeds into a river
- ✓ Water Quality- how healthy the water is

Procedures:

1. Have students sit in a group on the floor or at their desks in one section of the room.

Part A: What Makes a Fish a Fish? (5 min.)

2. Have one student come up and hold the fabric salmon
3. A. Ask the students in the group: How do you know when an animal you are looking at is a fish or not? What makes a fish a **fish**? Guide with questions such as, how does it move, breathe, see, stay safe, etc? What are its **adaptations**?
B. Answers:
 - a. Scales- for protection
 - b. Fins- for movement/swimming
 - c. Gills- for breathing
 - d. Inside Ears- hole in sides of head to hear
 - e. Lateral Line- for feeling what is around them, their sense of touch
 - f. Spine/Vertebrae- for body structure
 - g. Eyes- for seeing
4. A. Ask: What **habitat** do we find fish in? Where do they live?
B. Answer: Water or aquatic habitats.

Part B: Salmon Life Cycle (5 min.)

5. Have 7 students come up in front of the group.

6. Out of order, hand each student a card with a labeled picture of salmon eggs, alevin, fry, smolt, adult salmon in ocean, adult salmon returning up river, dead salmon.
 7. Move the students into the correct order as you lead the discussion of the sequence.
 8. Salmon Eggs:
 - a. In fresh water
 - b. Getting food from the yolk sac
 - c. Hidden among the rocks
 9. **Alevin:**
 - a. Hatched out of egg
 - b. Still attached to yolk sac
 - c. Hiding among rocks
 - d. Like a baby stage
 10. **Fry:**
 - a. Yolk sac is gone, all eaten up
 - b. Eating small insects in the water
 - c. Sticking close to rocks and plants for protection
 - d. Striping for camouflage
 - e. Like a young child stage
 11. **Smolt:**
 - a. Imprinting on River
 - b. Body changes to go into salt water, and color changes to silver; **Anadromous**
 - c. Moves down river into estuary with **brackish** water
 - d. Eating smaller fish and insects
 - e. Like a teenager stage
 12. Adult in the Ocean
 - a. Eating a variety of smaller animals
 - b. Spends 3-7 years here
 - c. Silver body
 - d. Like a young adult
 13. Adult in the River
 - a. Body changes to come back into the freshwater
 - b. Males get a bump on the head and more pink/red to attract females
 - c. Bump on males is for fighting other males
 - d. Spotting appears on both for camouflage
 - e. Wait until body is healthy, ready to spawn and wait for cold water in river- 50°
 - f. No feeding, just migrating up river
 14. Dead Salmon
 - a. Decaying salmon provides nutrients for other animals and the plants through the soil.
 15. When in the correct order, regroup them in a circle to reinforce the life cycle of the salmon.
- Part C: Salmon Redd (nest) Demo (5 min.)
16. Show the students the rocks within the container.
 17. Explain: This is the type of bedrock the fish are looking for to make their nest called a **Redd**.
The female will use her tail fin to make a depression or bowl shape in the rocks.
 18. Use the fin to demonstrate that

19. Pour some beads over the rocks
20. Explain: The female lays eggs in the nest and immediately a male swims over the nest to fertilize them. Watch where the eggs go.
21. A. Ask: Where did the eggs go?
B. Answer: Down in the rocks. They fall between the spaces.
22. Use the flipper to move a few rocks back over the nest.
23. Explain: The female may make several nests to lay her eggs in.
24. A. Ask: Why would she lay her eggs in this size of rock bed?
B. Answer: To protect her eggs.
25. A. Ask: How will the baby fish breathe?
B. Answer: through oxygen in the water flowing between the rocks.

Part D: Follow Your Nose Home (5 min.)

26. Have 3 students stand in front of the group and hand them each a river card label in the order of Putah Creek, Sacramento River, and American River.
27. Explain: Putah Creek flows from west to east mainly and into the Sacramento River. It is a **tributary** to the Sac River, because it **contributes** water to the Sac River. It passes through the Yolo Bypass Wildlife Area and into the Sac River. The American River flows from the Sierra Nevada Mountains to Folsom Lake and into the Sac River, so mainly from east to west. It is also a tributary to the Sac River.
28. Explain: Each waterway has a certain smell from all of the living and non-living things in it, such as plants, animals, minerals and rocks. This helps a salmon find its way back to its home river, where it was born.
29. A. Ask: How does a salmon find its way home?
B. Answer: A salmon finds its way home using its sense of smell, to smell the river waters, and following its nose home!
30. Explain: Its sense of smell is as strong as a dog's sense of smell.
31. Explain: Now you will each be an adult salmon ready to have babies, so you will find your way to your home river. Stand up and shake your body to represent your body going through changes to go from the salty ocean water back to the fresh water in the rivers. I will have you smell a scent and you need to swim (walk) up to the correct river by matching the scent you just smelled to the river smell. Stay with your river once you find it. Demonstrate this/model it to your students.
32. Give each student with a river card label one of the scent bottles to hold.
33. Group the students in 3 groups, and give each group a scent to smell (a bottle of a fragrance).
34. Send them over to the river card labels to figure out which river is their home (to swim up river to the river they belong to).
35. A. Ask: What might stop you from finding your way home to make more salmon?
B. Answers: Predators/getting eaten, no water, too much dirt floating around in the water, trash, chemical pollution, water is too warm, etc.
36. A. Ask: So would you say that the **water quality** or how clean the water is, is important for salmon to live?
B. Answer: YES!

Follow-Up/Close:

1. Perform informal post-student survey
2. Record answers for later input

Science Standards:

First Grade:

LS1.A: Structure and Function

- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

LS1.B: Growth and Development of Organisms

- Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

LS1.D: Information Processing

- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

Second Grade:

LS4.D: Biodiversity and Humans

There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)