

## UNIT 4D. SNIFFIN' SALMON: SALMONID LIFE CYCLES

TIME	LEVEL
60 minutes	Introductory

BENCHMARKS	
Next Generation Science Standards	LS1.B
NGSS Science & Engineering Practices	- Developing & using models - Planning & carrying out investigations
Common Core State Standards–Writing	CCRA.W.7
OR Social Sciences Academic Content Standards	HS.63

### INTRODUCTION

Can you remember when you were born? How about your first birthday? What is your earliest memory? How old were you then? How do you appear now, compared with when you were two? Twelve? Twenty? We all change in appearance from the time when we were a single fertilized egg. What is the nature of these changes? Are humans the only organisms which experience this?

Have you ever been “turned around” in the city, then found your way? What markers did you use? Could you describe the process to someone else? Do salmon experience the same thing? How do they know when they’re “home?” How many of us are living in the same place where we were born? Would your friends recognize you in your baby picture? Did our growth, development and travels dictate our needs, or visa versa?

This section uses the activity, Sniffin’ Salmon to simulate a salmon’s journey back to their home stream, using their keen sense of smell.

### OBJECTIVES:

- Students will simulate and discuss the life cycle of salmon, identify habitat requirements of salmon during stages of its life cycle, and understand how a salmon finds its way back to its native stream.

### MATERIALS:

- paper cups
- masking tape
- pencil
- paper towels
- cards with different salmon names on them
- several to many "smells" (cloves, garlic, vanilla, rum flavoring, peppermint, etc.)
- STUDENT HANDOUT 4D-1: Sniffin' Salmon!
- STUDENT HANDOUT 4D-2: Sniffin’ Salmon Diagram
- FILM: *Life of the Sockeye Salmon* (Optional. See Supplementary Curriculum for source.)

**KEY QUESTIONS:**

- What are the 'stages' of a salmon's life?
- What happens during each stage of their lives? Where do they go?
- Which stages will I observe at my site?
- What are salmon's needs during the part of their life cycle that I will observe?
- How does a salmon know when it is home?

**VOCABULARY** (Brief definitions of vocabulary terms are found in the Glossary.):

egg	alevin
fry	smolt
life cycle	fingerling
home stream	adult
migrate	parr smoltification

**PROCEDURE**

This activity is adapted from *The Comings and Goings of Coho, Water Water Everywhere....*, Oregon State University Sea Grant College Program and Oregon Department of Education.

1. You will need to gather the materials first. (You might have the students bring in some of the "smells." It is best to use smells that they can't recognize by brand name, so that they really have to remember the smell and not the name of the smell.)
2. Make the Field Guide to the Pacific Salmon and other reference materials available to the class. If you show the Life of the Sockeye Salmon video, they can use it as a reference also. Ask for student volunteers to read the first two paragraphs of Part I: Sniffin' Salmon. Facilitate any ensuing discussion. Have the students read the third paragraph. They should ask clarifying questions after reading.
3. Students then construct their "home streams" using the materials provided and following the directions on the handout. Basically, they crumple a paper towel, sprinkle or pour a "smell" on it, and stuff it into a paper cup. They then invert another cup over that cup, and tape them together. Place the cups so that the paper towel is in the upper half. Write the name of the hypothetical stream on the bottom of the bottom cup. Try to avoid visual differences amongst cups so that students won't have visual clues as they attempt to find their "home stream." (See diagram on STUDENT HANDOUT 4D-2.)
4. Using the reference materials at your disposal, explain the life cycle stages of the salmon. A prepared transparency with one stage of the cycle on successive overlays would enhance the study. As you discuss each stage, list on the transparency what the salmon needs to survive that stage.
5. After constructing their "home stream," students memorize its smell. They then leave the room, simulating the passage of salmon to the ocean. While they are out of the room, you might have them work on something, attempt to travel through a set of hazards, or watch the film, *Life of the Sockeye Salmon*. The idea is that the salmon are away from their home stream for some time. (This might be an opportunity to play Hooks and Ladders see Project Wild Aquatic.)

6. In the meantime, you or a cohort carefully move each "home stream" to another place. As long as containers are similar, students may not have an easy time recalling their "home stream" from visual memory. When it is time for the students to return to their "home streams," call them into the classroom, and ask them to find their "home stream" using their sense of smell.

## **EVALUATION**

7. After students are "home," encourage discussion of their experiences. An appropriate evaluation of this activity is a journal entry in which students describe their feelings upon returning to the classroom and searching for their home stream.

## STUDENT HANDOUT 4D-1

(This activity was written by Marvin Pemberton and Lynn Wilson for Salmon Watch in 1993.)

# Sniffin' Salmon!

### WHAT THIS IS ALL ABOUT:

This is a story about a salmon.

The Salmon's name is \_\_\_\_\_. (Write in YOUR name)

After a long period at sea, salmon return to spawn in the stream in which they were hatched. Just how they find their "home stream" was a mystery to us for many years. Now that many scientists have conducted research in this area, it seems probable that anadromous fishes (fish that migrate from their home streams to the sea and return to their fresh water stream to spawn) use the smell of the water to find their home streams. Other research has shown that salmon may use solar clues (the sun) at sea, but when they enter rivers, the sense of smell takes over in guiding them home. This seems to make sense because the sun would not be a very practical "landmark" to a fish traveling up a winding stream. Smell would be much more reliable.

The most remarkable thing about this method of navigation is the fact that the fish can "remember" the smell of their home stream after such long periods in the ocean. It is also surprising that similar streams would differ much in smell.

### WHAT WE'RE GOING TO DO:

In this activity, you will experience first-hand what it would be like to be a returning salmon attempting to identify a home stream by smell. The activity enables the entire class to participate in the salmon life cycle and the hazards of their journey. You will first select a home stream and try to memorize its smell, leave the room for a time to simulate going to the ocean to feed and grow, and then return and try to identify the stream by smell.

1. You will need the following materials:

- Paper cups
- Masking tape Pencil
- Paper towels
- Cards with different salmon names on them
- Several "smells"

2. Construct your simulated "home stream" by crumpling up a paper towel, sprinkling or pouring a "smell" on it, and stuffing the towel into a paper cup. Invert another cup over this cup, and tape them together. The paper towel should be in the upper end. Write the name of your hypothetical or actual stream on the bottom of the cup. See the drawing on the next page to help orient yourself.

## **STUDENT HANDOUT 4D-1**

3. Now, you are going to leave the room and do something else. This simulates the salmon smolt leaving its home and going to the ocean. When it is time, your teacher will tell you to return to the classroom.
4. Using your sense of smell and memory of the smells of your "home stream," find your "home stream." Describe how you knew you were in the right place.
5. How did you feel when you finally found your "home stream?"
6. Open your journal and reflect on what you have learned today.

## STUDENT HANDOUT 4D-2

### Sniffin' Salmon Diagram

