# GAME: SMELL YOUR WAY HOME!

**GRADE LEVEL:** Grades 1-4

**SUMMARY:** Students experience first-hand what it's like to be a returning salmon attempting to find its natal (home) stream using their sense of smell.

## OBJECTIVES:

*Students will:*

- Trace the migration journey of salmon from a local watershed to the ocean and back.
- Use their sense of smell to model how salmon navigate back to their home stream.
- Describe how humans might affect a salmon's ability to smell its way back home.

## MATERIALS:

- Map of local watersheds: something that can help explain the salmon's migration journey
- 4-5 river signs (e.g., Kalum, Lakelse, Bear, Bulkley, Morice, Kitwanga)
- 4-5 sets of scent cannisters: need 2 cannisters per set – one for students to "imprint" on, and one for each river. To make these, you will need:
    - 8-10 cottonballs
    - 8-10 containers (poke holes in top or sides or place coffee filter over top, secured by an elastic band and poke holes on top)
    - 8-10 scents (oils, lotions, spices – lemon, cinnamon, vanilla, etc.)

## BACKGROUND INFORMATION

**Salmon use their sense of smell to find their way to their home stream.** Salmon "**imprint**" on a characteristic bouquet of odors created by animals, vegetation, and minerals found in the stream where they were born. Even after spending several years in the open ocean, about 95% of salmon that return to spawn can remember what their home stream smells like. Salmon are sensitive to pollution and need a high quality habitat to survive at each life cycle stage. This is especially true for the time they spend in freshwater streams. They need cold, clean, clear, oxygenated freshwater in order to survive. Stream pollution may affect salmon in many ways, including their ability to navigate to their spawning grounds.

**Salmon depend more on their sense of smell than we could ever imagine.** Salmon can detect odours even better than a highly-trained tracking dog, and may even use their skin to help them smell! In addition to using their sense of smell for navigation, a salmon may also use its keen sense of smell to find prey or avoid predators. Salmon can detect the scent of digested salmon in otter poop! If they detect that an otter has been eating salmon nearby, they will avoid that area.

## PROCEDURE

***Warm Up:*** *Use the questions below to help guide a group discussion and introduce the activity.*

- What is your absolute *favourite* smell? (take answers until someone says a food). If you were to come home from school, and someone had made ___, do you think you could tell right away? Scent triggers memory better than any of our other senses.

- How do you think salmon find their way back to their home river to spawn – road maps? Landmarks? GPS? Salmon rely on water temperature and the earth's magnetic field to find their way to the right part of the coast, but they use smell to find the right river. Salmon have an excellent sense of smell. In fact, they have a better sense of smell than a highly trained tracking dog. And that's a good thing too! Because salmon rely on their sense of smell for their "great journey"!
- Do any of you know what the salmon's "great journey" is? *Salmon are born from eggs in a stream (point to one of the sites on the watershed map. Review the life cycle stages in appropriate detail for your group). When they get big enough, they leave their stream, go through this big river (*What is it called? Skeena River) *and head out to the ocean, where they hunt and grow big and strong. After about 3 years, the salmon will return home. They have to (again trace on map) go into the Skeena River, find their stream, and swim all the way back to where they were born.*
- How do you think the salmon is able to know which way to go? Do you think the river looks exactly the same after several years or has it changed maybe? *Let kids share.*
- If all the roads were changed around between your school and your house, do you think you'd still be able to find your way? What if you could smell ___? *Let kids share. The salmon can remember the smell of their home stream, and can follow that smell all the way home! Pretty amazing, right? Today, we are going to practice finding our way home the same way a salmon does, by smell.*

***Activity:***

Designate 4-5 players to be home rivers – they do not move. The rest are divided into 4-5 groups as spawners who must find their home creek by moving (swimming) from river to river to find their home by smell. Give each 'river' a canister with a different scent extract (e.g., cherry, lemon, peppermint or baby oil).

**Imprinting**: Give each group an "imprint" canister at random. This represents the smell they remember when they were fry in the river. Each student gets a turn to smell the canister. Everyone should use their sense of smell to determine their home river by sniffing and comparing it to the canisters of the different 'rivers' to find the right one. As soon as they find it, have them stay together until all the salmon find their home river.

**Out to the ocean:** have students all go out past "**Skeena River**" sign and to "sea". They will swim around for a minute and then, as a group, it is time to return home.

**Find your stream:** Each group must stay together as they go from stream to stream smelling the vials to find their "match". When they think they've found the right one, they can call out to the teacher to verify (numbers taped under the canisters will match). After all of the salmon have found their stream, bring them all back together either for another round or to wrap up the activity.

***Wrap Up:*** *Discussion questions:*

- Did you find this activity to be easy, or sort of difficult? Do you think some scents were easier to remember than others, if so why?
- What do you think makes a stream smell the way it does? Talk about what influences a stream's scent
- *What might affect the salmon's ability to recognize their home stream? Discuss how environmental pollution might affect their ability to smell (e.g., if I placed garlic in one of the canisters, would that impact your ability to find the right home stream?*

*Adapted from: "Salmon Sense", Alaska SeaLife Center*