

Station A3: Salmon Life Cycle

Learning Objectives:

- Salmon have a highly sensitive sense of smell.
- Each stream has a unique smell, and salmon find their way home by smelling the water.
- Some threats to salmon include types of chemical pollutions that impact their ability to smell.

Preparation:

- Day in advance: soak the ropes in the essential oil mixture and assemble the small jars of oils (see Preparation section below for details).
- Morning of trip: hammer stakes into the ground and attach ropes and signs.
- Morning of trip: collect Bigleaf Maple Sample

Chaperone Role:

Help students who may need mobility assistance (lifting up ropes, etc.) or other accommodations during the game.

Assist in the hand-out of the small jars/giving new jars to students for multiple rounds.

Accompany students who are having trouble to give a "second opinion."

Vocabulary

Nares: the salmon's nostrils (used for smelling, not breathing)

Materials

- Bigleaf Maple plant sample (small branch or several large leaves)
- Plant Teaching book and Plant cards
- 8 40ft lengths of 5mL macramé rope
- Small table
- 16 small jars (or enough for each student)
- Pack of cotton pads or cotton balls
- 16 stakes
- Mallet
- 8 different essential oils
- Glycerin
- Water
- Gloves
- Paper towels

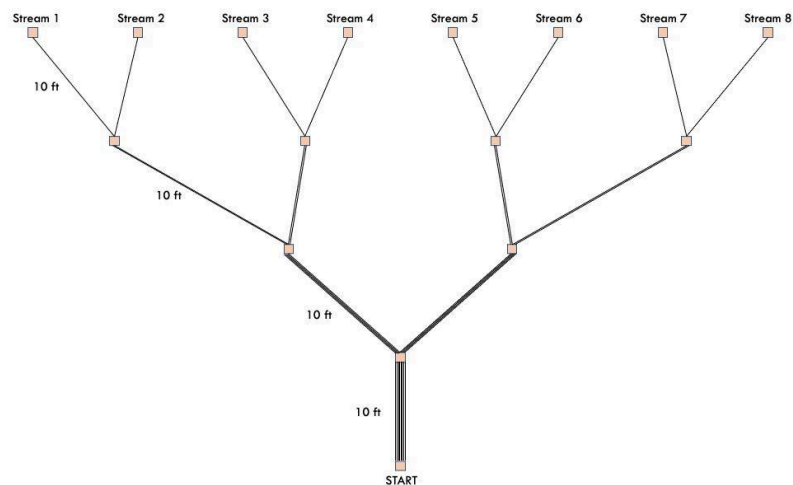
Preparation:

Each rope will be soaked in a unique oil mixture overnight before the lesson. To make each mixture, stir 3 teaspoons of the oil and 3 teaspoons glycerin in a watertight container labeled with the scent. Add 2 cups of water and mix, then add the rope (you may need to top off with water to cover the rope). Shake vigorously. Repeat for the remaining 7 scents. Allow to soak overnight or up to a week.

To prepare the small containers of scents, label the bottom of 16 small jars (2 of each scent; or however many you need for each student to use a jar) with the scent name. Soak a cotton pad/cotton ball with the corresponding essential oil and add to the jar.

Set up the table and place the small jars on top for students to use. Place the Bigleaf Maple sample on the table as well.

To set up the course, hammer 16 stakes into the ground at 10 ft intervals (see diagram below). The simplest way to do this is to hammer in all the stakes except for the end 8 stakes, which **are different, and have an extra strip of Velcro for the signs**. At the start, tie each rope to the stake for extra stability, then draw the ropes over the top and Velcro into place. At each junction, divide the ropes in half and continue on. Once you have all the ropes ready, you will know the exact position/distance you'll need to place the final stakes in. The ropes do not need to be in a particular order, so long as **you know which stream has which scent**. Finally, Velcro each sign onto the end stakes.



I) Introduction/Plant Teachings

10 min.

- a) Welcome students to the table and invite them to touch/hold/interact with the plant sample. Ask if any students know what type of plant it is. Point out Bigleaf Maples trees if there are any nearby.
- b) Ask students to sit or lay down and close their eyes and listen as you read the green boxed text from page 15 of the plant teachings book. Stop before the bulleted questions. Once finished, ask them to open their eyes. Invite them to slowly wiggle their fingers and toes, then ankles and wrists, then arms and legs. Ask if they notice any part of their body they are holding tension or stress in. Example dialogue: *When I'm stressed or upset, my shoulders and neck feel tight and sore. I have to make a point to lower my shoulders and roll my head around to loosen up. What about you all?* Invite students to share if they are feeling tension. Depending on the amount of time and comfort level of the group, everyone can share in a circle, with a partner, or by raising a hand.
- c) *In the same way that the Bigleaf Maple lets go of all its leaves each fall, we have to let go of tension and stress.* Invite students to share ways that they let go of stress (examples to get them started could be going on a walk, watching TV with family, playing with a pet or friend, or listening to music.) After they share, point out methods of stress relief that involve support from other people. *Sometimes it can be so helpful to have other people to help you! Sam mentioned playing outside with his brother, Maya mentioned calling her best friend; having support is so important when you are feeling overwhelmed!* Have them turn to page 8 in their nature journal. Invite them to brainstorm ways they can give support to salmon during their (very challenging!) life cycle.

II) Salmon Do Smell!

2-3 min.

Briefly recap the salmon life cycle and point out that they leave their home stream, travel hundreds of miles to the ocean, and then must return to the same place they were born to lay their own eggs. Ask if students have any theories about how they are able to find their way home. Share that salmon have an excellent sense of smell and can smell the difference between the smell of their home stream and other waters. Remind students that their home stream probably doesn't flow directly to the ocean; it combines with other streams and rivers before flowing out to the ocean. *In order to get an idea of what that journey must be like, we are going to play a game that simulates how the salmon smell their way home!*

III) Smell Your Way Home

15 min.

- a) Introduce the game and how it works. Direct their attention to the ropes. *Each rope is a home stream for one or more of our salmon! We will be sniffing our way along the ropes from the start all the way up to our birthplace.* Explain that each rope has been dipped in a different scent, and each student will receive a jar with the scent of one of the 8 streams. Their task is to use that scent in the jar to guide them upriver to their home.
- b) Pass out the jars and lead students to the start. You (or a chaperone) can go first, demonstrating how to play. Sniff your jar, then sniff along the ropes to the junction points and determine which branch your rope is part of, then continue on.
- c) As students begin working up the ropes, remind them to keep comparing the ropes to their jar to refresh their memory of home. If they get lost, they can return back to the start.
- d) As students reach an end point, have them flip over their jar. Tell them if they got it right or not. If they got it right, they can return to the table and grab a new jar to start again to see how many fish they can successfully get upriver. If they were wrong, send them back to the start.

Optional modifications:

- Advanced mode: have students only sniff their jar once at the start, then keep it closed until the end of the stream.
- Easy mode: have students pair up with one jar and consult each other at each junction for a second opinion.

IV) Closing

2-3 min.

Have students place the jars back on the table. Share with them that one of the challenges salmon face is pollution that affects their sense of smell. *Certain chemicals found in brake pads on vehicles can cause salmon to lose their sense of smell. Can you imagine how much harder this game would be if you had to hold your nose the whole time? Most of us would not make it back to the right stream!* Share with students that it's important to realize how even small amounts of everyday chemicals can impact the lives of salmon, and encourage them to do their own research on salmon senses and their amazing journeys.

Total Time: 30 minutes

Helpful Tips

- Wear gloves to set up the course, as you will need to squeeze the excess soaking liquid out of the ropes.
- The essential oils may begin to lose their potency throughout the day, especially in bright direct sun. To refresh the ropes, dip a paper towel into the soaking liquid and wipe the entire rope with the wet paper towel.
- Students with weak senses of smell can be given strong scents such as peppermint or cinnamon.
- Modifications for indoor play: ropes can be tied to chairs/tables/music stands/etc instead of stakes.