Grade 2
Example for Place-Based Learning

GRADE 2
Big Ideas for Science

B BIOLOGY

All living things have a life-cycle.

C CHEMISTRY

Materials can be changed through physical and chemical processes.

P PHYSICS

Forces influence the motion of an object.

E EARTH SCIENCES

Water is essential to all living things and it cycles through the environment.

HCTF Education

In this example, we focus on the the life cycle of salmon B and the water cycle E, with a First Nations perspective, and cross-link this with examples of chemical and physical processes C, and the force of gravity P.

PLACE: A local creek, river, lake or estuary (ideally one that salmon inhabit, whether historically or currently)

Augment experiencing place: invite a First People's representative as a guest speaker to tell of the interconnection of salmon, place, and their people, and water as that which connects life; visit a local salmon hatchery; attend a spawning event field trip; participate in DFO's Salmon in the Classroom; organize your school staff for a Project WET Pro-d workshop through HCTF Education.

---

1 Experience Place

TONE: open-minded, unburdened, curious, playful

Allow a natural curiosity to emerge and develop within students' personal and direct exploration.

Storytelling: choose a Story of the Salmon People

- E.g., Why the Salmon come to the Squamish Waters http://www.firstpeople.us/FP-Html-Legends/Why-The-Salmon-Come-To-The-Squamish-Waters-Squamish.html

- Watch: Salmon Story Part 1, narrated by Willy Whitefeather, YouTube, 6:50 m.

FOCUS: Create place-based experiences, such as;

- Walk along the shore edge of the waterbody in silence (e.g., walk like coyote [quiet feet, slowly])
- Solicit observations of the water (its movement, colour, sound, etc.), of the area surrounding the water
- Choose individual sit spots for quiet contemplation
- Regroup and share experiences of feelings
- Create water ceremonies to honour the water, in small groups, then share
- Play an active game of Hooks 'N Ladders (Project WET) or any game of tag with a water or salmon theme

2 Questioning and Predicting

TONE: more focused, curious, reflective

E B Water is the life sustaining gift of Mother Earth and is the interconnection among all living beings. First Peoples have a spiritual connection with water. Their traditional activities have depended on water for transportation, cleansing, purifying, and providing habitat for plants and animals gathered for medicine and food. First Peoples tradition recognizes the sacredness of water. Salmon, water and First Peoples are interconnected.

What is the salmon life cycle? How do salmon find their way home? What time of year and part of the life cycle are salmon in our local creek/water body? How are salmon, water and First Peoples interconnected?

What is the source of the water in the creek/water body, i.e., from where does it come?

C Consider chemical and physical processes: A chemical change is when a chemical reaction produces a new substance, new stuff. When a chemical reaction happens there is often heat, light, colour change, odor or sound produced. Example: cooking an egg, burning wood, striking a match. A physical reaction involves energy and/or a change of state/phase, but the stuff is still the same stuff. Example: breaking a glass bottle, water freezing to ice.

1) What happens to salmon after they spawn and die? What does their rotting body turn into? (Transforming from a fish and rotting is a chemical process.)

2) First Nations made dye from soil (diatomaceous earth) and salmon eggs. (Dirt used as a dye is a physical process.)

3) Can water be anything else other than liquid, as it is in the creek/river/lake? (Water changing state is a physical process.)

P Which way does the water flow? What forces influence the direction of movement? How could we investigate this? (When something pushes or pulls it is called a force; gravity is the primary force that draws water downhill.) How do salmon swim out to sea or swim back up to spawn? What forces are involved?

3 Planning and Conducting

TONE: creative, restrained, calculating, collaborative

E B **1) KUD (Know, Understand, Do):** use a graphic organizer, such as a chart or mind map, and as a class determine what is already known or understood about the salmon life cycle, and about First Peoples traditional ways. Invite students to learn more about the salmon life cycle (e.g. field trip, elder's visit, story books like The Salmon Forest, short films). Plan together what to do.

2) Prepare questions for the First People's guest speaker about the important role of water and salmon. Prepare a gift to honour the guest. Invite a guest speaker to the class.

3) Explore the water cycle. Play Project WET's Incredible Journey (*available for purchase from HCTF @ https://hctfeducation.ca/product/the-incredible-journey/* or take a Project WET workshop to get your book)

C **1) Plan and conduct an experiment for a chemical process**: place a piece of salmon in a potted plant, make and record regular observations of what happens over time (until the odor is too much!). (This could also be done in a terrarium or plastic salad container.)

2) Plan and conduct the making of paints as First Nations did traditionally, using diatomaceous earth (buy at gardening store), salmon eggs (buy at a fishing shop, get from a fisher) and saliva. *http://vancouver.24hrs.ca/2015/10/22/first-nations-paint-reproduced.* Use the paint to draw a fish on a piece of wood.

3) Plan and conduct experiments with water and its different phases (liquid, solid, gas), as examples of a physical process (while developing an understanding the water cycle).

P Plan and conduct experiments to study force using water, different channel sizes, slopes, and water bodies.

4 Processing and analyzing data and information

TONE: observant, methodical

E B **1) Tally and record new information** about the salmon life cycle. Draw the salmon life cycle.

2) Draw a web of water as sacred. Place water in the centre. Draw its many connections, including how it sustains life and has sustained First Peoples for thousands of years.

3) Incredible Journey: after playing, sort the beads by colour, count them, draw a class graph of bead colour by quantity.

C **1)** Record observations of the rotting salmon, as a chemical process. Investigate the Salmon forest cycle: *https://prezi.com/1peffx8ezgae/salmon-forest/;*
Watch the Salmon Forest: *http://www.bbc.com/futurestory/20140218-salmon-fertilising-the-forests.*
When is the salmon no longer recognizable as salmon? What happened to it? Where did it go?

2) How difficult was it to make paint from soil using natural materials?

3) Dialogue on changing the states of water as a physical process for changing matter.

P Consider the observed results of the experiments - when did the water move fastest? Slowest? Not at all? How did it freeze? Evaporate? Condense?

5 Evaluating

TONE: discerning, reflective, interdependent, collaborative

E B **1) How is the salmon life cycle dependent** on the river/water body? What kind of water do salmon need to thrive and survive and spawn? How do First People's activities depend on the Salmon People? (food, social, art, drama)

2) How is the water cycle connected to the salmon life cycle? How does water, as the blood of Mother Earth, connect and sustain all life?

3) Incredible Journey: group the beads by colour, count them, which water state had the most beads? The least beads?

C How does rotting salmon affect soil and life connected to it? What can we conclude about the role of water in different states? If changing the phase of water is a physical process, what do your observations suggest to you about what a physical process is? If turning sunlight into plant matter is an example of a chemical process, how would you recognize a chemical process? How are the two different? How are they similar?

P In what situations does water flow the fastest? Slowest? How does the speed of flowing water and forces change with size of channel, slope, and when it enters a large body of water? What can we conclude about the forces acting upon water? What is the significance of the changing states of water as a physical process for the life cycle of salmon?

6 Applying and Innovating

TONE: reative, open-minded, interconnected, engaging

E B **1) Reflect on what else has a life cycle?** Reflect on what you could do to help the salmon and treat water as sacred. Make a pledge to do one thing for the salmon, and for water.

C Conduct different demonstrations of processes changing matter and identify as chemical or physical. (Find common everyday examples on the internet.) Plants apply a chemical change (reaction) called photosynthesis when they change carbon dioxide and water into food and oxygen in the presence of sunlight. This is one of the most common everyday chemical processes and one of the most important. Consider First Nations' plant technologies as examples of physical changes to matter.

P Apply your understanding of force, either the force of gravity or the force of water, to demonstrate how this force is used, in nature and in technology.

7 Communicating

TONE: confident, engaging, interpretive, expressive, sensory, using technology

B Sing salmon & water songs; i.e.

1) Holly Artzen: Up your watershed *https://www.youtube.com/watch?v=3C1sBv1svKo; https://www.youtube.com/watch?v=GvOOHAifx1I;* lyrics can be found elsewhere;

2) Remy Rodden: The Spawn Song *https://www.youtube.com/watch?v=EbMGciihozc;* lyrics by Joe Bishop at http://remyrodden.com/track/405014/the-spawn-song;

3) a song of the local First Nation

C Demonstrate a physical process and a chemical process for changing matter.

P Demonstrate with hands-on activities different aspects of force.

E Act out the water cycle with hand gestures or dramatic play. Give an example of a ritual with water as sacred and purifiying.