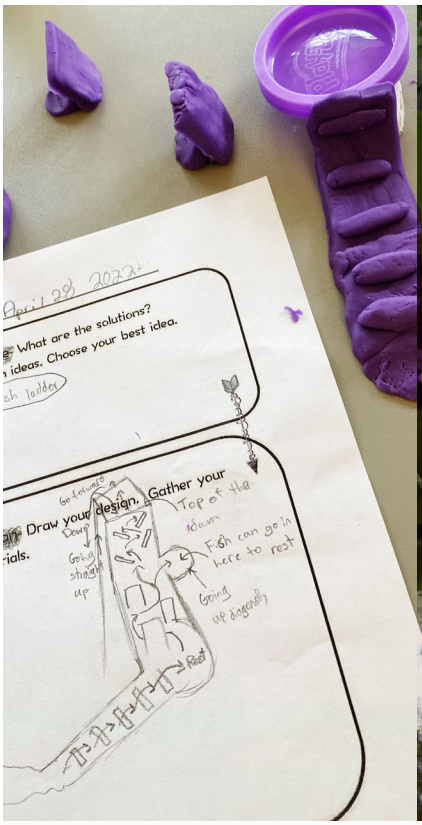
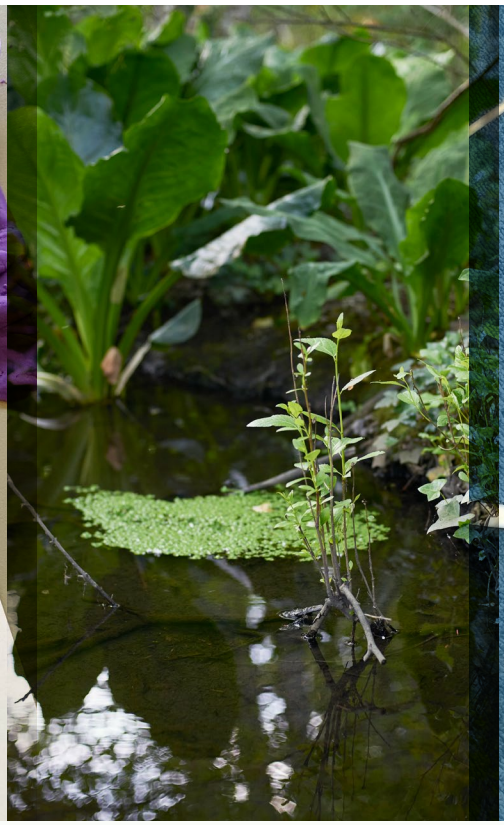
engage with Nature-Based Solutions





BC Urban Streams & Watersheds

A UNIT PLAN FOR **INTERMEDIATE GRADES (4–6)**

The Big Idea

Humans can play a role in stewardship and restoration of aquatic ecosystems to sustain salmon populations and biodiversity.

BC Urban Streams & Watersheds

A UNIT PLAN FOR INTERMEDIATE GRADES (4–6)

This unit plan was created by **Jennifer Walton**, BA, BEd, Diploma in Environmental Technology, Teacher in Greater Victoria, BC.
This version is from March 6, 2025.

This is published by **Engage with Nature-Based Solutions**. Engage with Nature-Based Solutions is an initiative to support communities who apply nature-based solutions to their local lands and waters. We acknowledge and take inspiration from Indigenous peoples, whose cultures and traditions support healthy ecosystems and the interconnection and importance of all living things.

Engage with Nature-Based Solutions is a collaboration between the **University of Victoria** and many local community organizations, and is funded by **Environment and Climate Change Canada**.
The grant Principal Investigator is **Dr Kris Dubrawski**.
The Program Lead is **Dr Maleea Acker**.

Contents

Engage with Nature-Based Solutions: About the Initiative

Natural systems work. Natural systems – such as wetlands, estuaries, forests, and prairie – provide immense benefits to people and nature. They clean water, absorb floods, cool the climate, and remove carbon from the atmosphere. There is a pressing need to mitigate the stresses that human activity places on these natural systems. Urban development and climate change threaten biodiversity, fragment previously healthy ecosystems, increase droughts and flooding, and affect the security of our food and clean water.

Nature-based solutions support the health of natural systems, while addressing societal challenges. The design of these solutions are based on our planet's natural systems, working with, and for, nature. They increase climate-resilient natural capital (such as wetlands and forests) and provide ecosystem services (such as water filtration). Communities can use nature-based solutions to support the resiliency of our climate, environment, and human society.

Engage with Nature-Based Solutions is a new initiative to support communities who apply nature-based solutions to their local lands and waters. We acknowledge and take inspiration from Indigenous peoples, whose cultures and traditions support healthy ecosystems and the interconnection and importance of all living things.

We collaborate with communities, collect and curate resources, produce education modules, facilitate storytelling, and provide technical equipment (for monitoring and testing in the field). All of our work supports access, engagement, and education, and illustrates the impact and benefits of nature-based solutions.

→ Learn more at *www.engagewithnbs.ca*

engage with Nature-Based Solutions

communities in local stewardship of lands & waters

About this Unit Plan

This BC Urban Streams & Watersheds unit plan for Intermediate Grades (4–6) connects to the BC Ministry of Education curriculum and explores this **Big Idea: Humans can play a role in stewardship and restoration of aquatic ecosystems to sustain salmon populations and biodiversity.**

As an Environmental Science teacher and outdoor educator in Victoria, BC, I designed this unit to help teachers guide their students in learning about British Columbia's watersheds through inquiry, experiential, project-based, and interdisciplinary learning. Some of these lessons were inspired by collaborations with my collegues, including a former teaching partner and salmon mentor, Bev Waterfield.

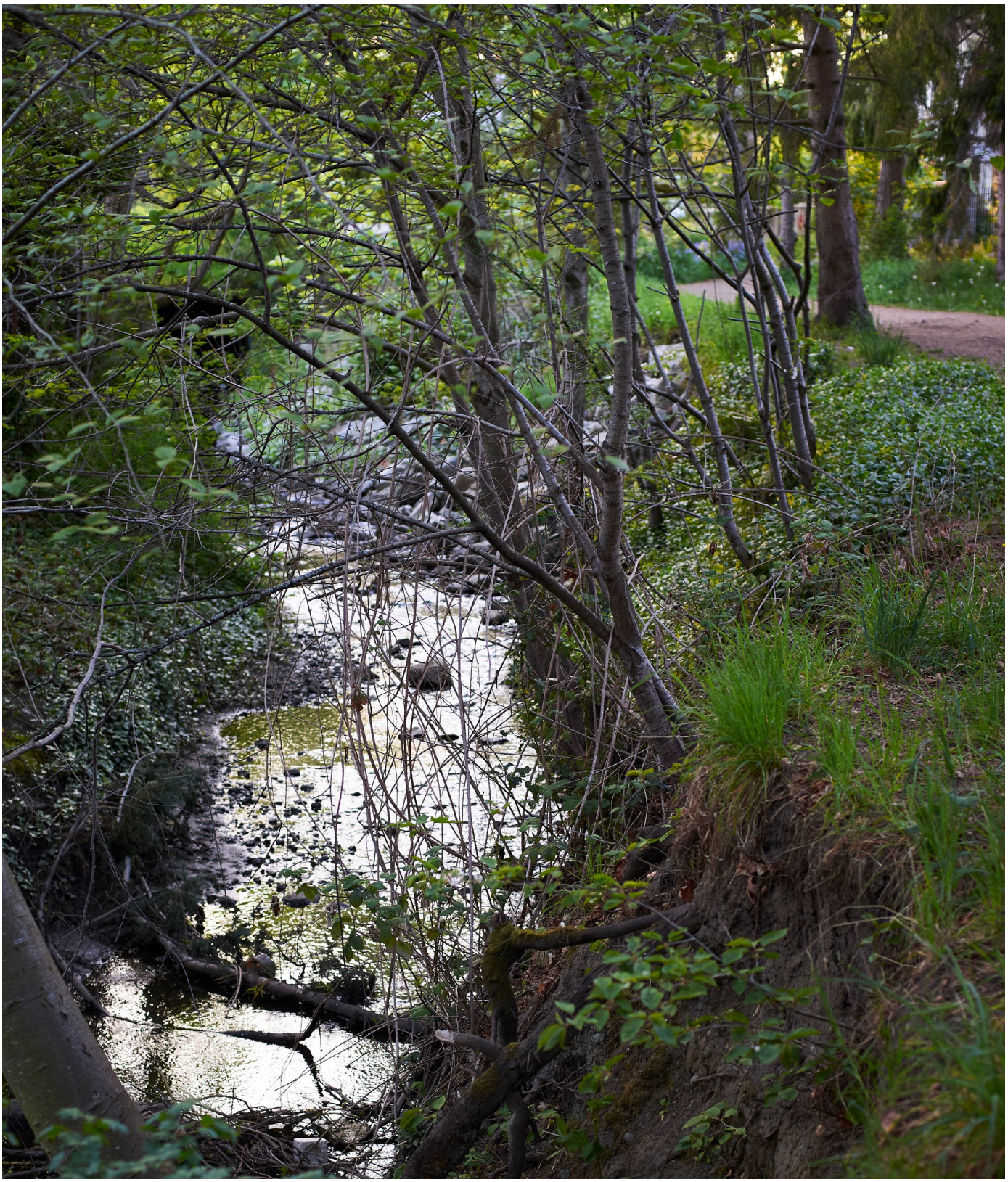
Exploring British Columbia's watersheds through our keystone salmon and other aquatic species provides an engaging way to connect students to their local watersheds. Students can collaboratively connect Indigenous perspectives and ways of knowing to scientific evidence, as they contribute to finding solutions to local watershed issues.

Educators are encouraged to collaborate with local community organizations to learn more about environmental stewardship initiatives, stream restoration, urban watersheds, riparian vegetation, water quality, chum salmon recovery, biodiversity, sustainability, and hopeful nature-based solutions when using this unit plan.

I firmly believe that students need to spend time outdoors in our watersheds if they are going to learn to appreciate the environment and ultimately want to protect our biodiversity.

We hope this unit plan will be helpful to your classrooms. We would love to hear from you – how you found it useful, and any suggestions you have for improvement. Contact our team at *info@engagewithnbs.ca*.

Jennifer Walton
BA, BEd, Diploma in Environmental Technology,
Teacher in Greater Victoria, BC



BC's Curriculum: Intermediate Grades (4–6)

This unit plan was developed with Grades 4–6 classrooms in mind. The BC Ministry of Education lists a variety of Big Ideas, Competencies, and Content for the students to work towards, all of which are listed at *https://curriculum.gov.bc.ca/curriculum*. This BC Urban Streams & Watersheds unit plan supports multiple learning areas for Grades 4–6, including *Science*, *Arts Education*, and *Applied Design, Skills, and Technologies*.

The BC Ministry of Education also identifies a list of Core Competencies. (This text is extracted from *https://curriculum.gov.bc.ca/competencies* in 2024.) These are sets of proficiencies that all students need in order to engage in deep, lifelong learning: Communication; Thinking; and Personal & Social abilities.

Communication
Encompasses the knowledge, skills, processes, and dispositions we associate with interactions with others. Through their communication, students acquire, develop, and transform ideas and information, and make connections with others to share their ideas, express their individuality, further their learning, and get things done. The communication competency is fundamental to finding satisfaction, purpose, and joy.

Thinking
Encompasses the knowledge, skills, and processes we associate with intellectual development. It is through their competency as thinkers that students take subject-specific concepts and content and transform them into a new understanding. Thinking competence includes specific thinking skills as well as habits of mind, and metacognitive awareness. These are used to process information from a variety of sources, including thoughts and feelings that arise from the subconscious and unconscious mind and from embodied cognition, to create new understandings.

Personal & Social
The set of abilities that relate to students' identity in the world, both as individuals and as members of their community and society. Personal and social competency encompasses what students need to thrive as individuals, to understand and care about themselves and others, and to find and achieve their purposes in the world.

Associated Files

The lesson plans within this unit reference a variety of files that we've created or assembled for you to download from our website. Each is available in PDF, and many are also available in additional, easily editable formats.

SUPPLIED SUPPLEMENTS:

- *Science World - Salmon in the Food Web Introduction* (PDF)
  used in Lesson 1
- *Science World - salmon phylo cards* (PDF)
  used in Lesson 1
- *Science World - salmon board game* (PDF)
  used in Lesson 1
- *Stream to Sea - salmon life cycle poster 1* (PDF)
  used in Lesson 1
- *Stream to Sea - salmon life cycle poster 2* (PDF)
  used in Lesson 1
- *PSF - Salmon Life Cycles teachers guide* (PDF)
  used in Lesson 2a
- *PSF - Salmon Life Cycle illustration* (PDF)
  used in Lesson 2a
- *PSF - Species of the Salish Sea discovery booklet* (PDF)
  used in Lesson 2a
- *Science World - salmon life cycle cards* (PDF)
  used in Lesson 2a
- *ENBS - Salmon Life Cycle Puppets planning sheet* (RTF · DOCX · PDF)
  used in Lesson 2b
- *ENBS - Salmon Life Cycle Puppets self-reflection* (RTF · DOCX · PDF)
  used in Lesson 2b
- *ENBS - Salmon Life Cycle Puppets hand stitches* (RTF · DOCX · PDF)
  used in Lesson 2b

- *Theatrefolk - Self Assessment Checklist* (PDF)
  used in Lesson 2c
- *ENBS - Urban Stream Design Sketching* (PDF)
  used in Lesson 3
- *ENBS - Salmon Stream Solutions design brief* (RTF · DOCX · PDF)
  used in Lesson 4
- *ENBS - Salmon Stream Solutions design challenge map* (RTF · DOCX · PDF)
  used in Lesson 4
- *ENBS - Salmon Stream Solutions self & teacher evaluation* (RTF · DOCX · PDF)
  used in Lesson 4
- *ENBS - Urban Stream Comic story rubric* (PDF)
  used in Lesson 5
- *Global Goals - Annie Sunbeam comic 1* (PDF)
  used in Lesson 5
- *ENBS - Town Hall Meeting for a Local Urban Stream* (RTF · DOCX · PDF)
  used in Lesson 5
- *RWT - Town Hall Meeting guide* (PDF)
  used in Lesson 5
- *RWT - KWL Chart* (PDF)
  used in Lesson 5

The complete set is available to download at: *https://engagewithnbs.ca/for-schools*

The Big Idea

Humans can play a role in stewardship and restoration of aquatic ecosystems to sustain salmon populations and biodiversity.

LESSON 1

The Importance of Salmon in our Coastal Watersheds & Food Webs

Learning about British Columbia's keystone species, the Pacific salmon, provides an engaging way to connect students to their local urban streams. In this lesson, students learn about the significance of salmon in our coastal watersheds. However, students can inquire into other BC freshwater fish including steelhead, white sturgeon, kokanee, trout, bass, or perch that live in your local streams.

Essential Question

What is the role of salmon within a watershed?

Objectives

Students will be able to:

- Explain the significance of salmon in our coastal watersheds of British Columbia.

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *Science World - Salmon in the Food Web Introduction* (PDF) — READ
  - » *Science World - salmon phylo cards* (PDF) — PRINT 1 SET PER GROUP OF 3–4 STUDENTS
  - » *Science World - salmon board game* (PDF) — PRINT 1 COPY PER GROUP OF 3–4 STUDENTS
- Cut phylo cards and place into envelopes
- Internet access, computer, projector, speakers
- Post-it notes
- Student notebooks or Exit Card

Introduction

- Introduce salmon as a **keystone species** – many organisms rely on salmon as an essential food source and are important to maintaining biodiversity in British Columbia's watersheds.
- In small groups, have students place the salmon in the centre of the board and construct a food web using remaining cards. (Some cards are possible salmon food sources or predators of salmon.)
- Prompt students to discuss in their groups and as a class: **If salmon are removed from this food web, how are other organisms affected?**
- Have students keep their completed salmon food web board.

Activity

- Watch (6 minute) *D Suzuki_Salmon and the forest* as David Suzuki discusses the interconnectedness of the salmon and different ecosystems. Researchers discovered the transformation of marine nutrients to terrestrial organisms involves 15N and rich fertilizer. Pause the video to explain more complex vocabulary and concepts.
  https://youtu.be/UOtkekP-sxk
- Have students write any other organisms mentioned in the film onto Post-it notes and add them to their own salmon food web or make a list of organisms that may interact with salmon.
- Have a "Think, Pair, Share" activity. (Think, Pair, Share involves posing a question to students, then give them a few minutes to think. Then invite students to pair with a nearby student to share their thoughts.) The question is: **How do salmon help the trees in the forest?**

Evaluation / Assessment

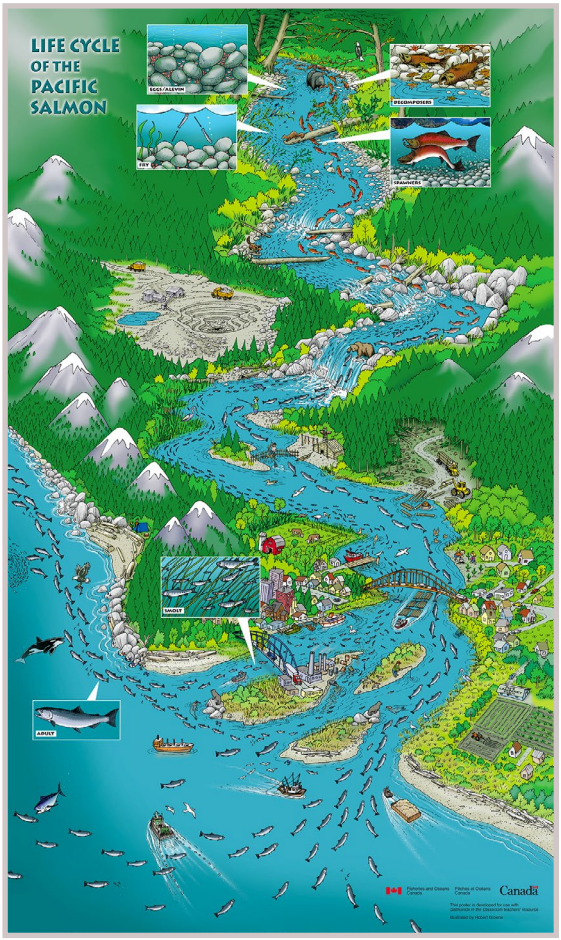
- In a notebook, or on an Exit Card, have students consider 1–3 things they learned about the role of salmon within a coastal watershed ecosystem.

Extension

- Raise salmonids in the classroom!
  (See *Stream to Sea Program* at *https://www.blscs.org/salmon/sitc.html*)
- Participate in a Peninsula Streams & Shorelines Program or other local organizations for experiential, place-based learning opportunities about watershed and salmon education, restoration, and stewardship. *https://peninsulastreams.ca/our-work/education-programs/*

Additional Resources

- SUPPLIED SUPPLEMENTS:
  - » *Stream to Sea - salmon life cycle poster 1* (PDF)
  - » *Stream to Sea - salmon life cycle poster 2* (PDF)
- Pacific Salmon Foundation: Salmon School
  (has a variety of resources for a salmon unit)
  https://psf.ca/learn/salmon-school/
- Fisheries and Oceans Canada' Salmonid in the Classroom Intermediate curriculum
  https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40690945.pdf
- FNESC: Salmon and Interconnectedness
  (is for Grades 10–12, but can be adapted)
  https://www.fnesc.ca/wp/wp-content/uploads/2019/08/3.6-Salmon-and-Interconnectedness-1.pdf
- Salmon: The Vital Link poster
  https://www.salmonidsintheclassroom.ca/pdf/0911/SHKPuget11x17.pdf
- Notable BC Freshwater Fish website
  https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/aquatic-species/bc-fish-species



LESSON 2A

Salmon Life Cycle Introduction

While there are many classroom resources available for learning about the salmon life cycle, the Pacific Salmon Foundation's Salmon Life Cycle Resources from their Salmon School provides essential background knowledge and student activities prior to this cross-curricular salmon life cycle project. *https://psf.ca/learn/salmon-school/#marine-science-2*

This three-part lesson encourages students to collaborate in small groups and demonstrate their understanding of the salmon life cycle by illustrating a poster, designing and creating a puppet, writing a script using scientific language, and performing their group's salmon life cycle to an audience.

Essential Question

What connections can I make between the salmon habitat and the Indigenous peoples of the Pacific Northwest?

How can I demonstrate my understanding of the salmon life cycle?

Objectives

Students will be able to:

- Identify the salmon life cycle stages in order.
- Write about a particular role (egg, eyed-egg, alevin, fry, smolt, adult, spawner) in the life cycle of the Pacific salmon.

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *PSF - Salmon Life Cycles teachers guide* (PDF) — TO READ
  - » *PSF - Salmon Life Cycle illustration* (PDF) — PRINT 1 COPY PER STUDENT
  - » *PSF - Species of the Salish Sea discovery booklet* (PDF) — [OPTIONAL] PRINT 1 COPY PER STUDENT OF (SALMON-SPECIFIC PAGES 3, 4, 5, 14, 16, AND 18)
- Internet access, computer, projector, speakers

Introduction

- Watch (7 minute) *I am Salmon* featuring the journey of salmon back to their spawning grounds highlighting the significant connection between the environment and the Indigenous peoples of the Pacific Northwest. *https://youtu.be/Q5sZL20SYCk*
- Brainstorm, as a class, a list of different stages and habitats of the salmon life cycle mentioned in the film and write a list on the board:
  - » eggs – gravel beds of small creeks and streams;
  - » alevins – stay hidden in rocks and gravel bed;
  - » fry – hide in branches and water plants;
  - » smolts – swim to estuaries to adapt from freshwater to saltwater (smoltification);
  - » juvenile adults – ocean;
  - » and spawning adult – back to stream to reproduce.

Activity

- Watch (25 minute) *'Salmon Life Cycles' featuring PSF Biologist Samantha James*. https://youtu.be/wEdDLc4XeAM
- Encourage students to take notes about the name, description, habitat, and nutrition of each stage of the life cycle in their notebooks or print copies of the *PSF - Species of the Salish Sea discovery booklet* (salmon-specific pages 3, 4, 5, 14, 16, and 18).

Assessment

- Students can illustrate their own salmon life cycle poster with a description for each stage.

Extension

- Consider the environmental and human threats that prevent salmon from completing their life cycle.
- Match salmon life cycle sorting card images with description using *Science World - salmon life cycle cards.*

Additional Resources

- NOAA Fisheries: An Incredible Journey: A Series of Educational Resources to Promote Salmon Stewardship. *https://www.fisheries.noaa.gov/west-coast/outreach-and-education/incredible-journey-series-educational-resources-promote-salmon-stewardship*

LESSON 2B

Salmon Life Cycle Puppets

Essential Question

What skills and materials do I need to plan, design, and create a salmon life cycle puppet?

Objectives

Students will be able to:

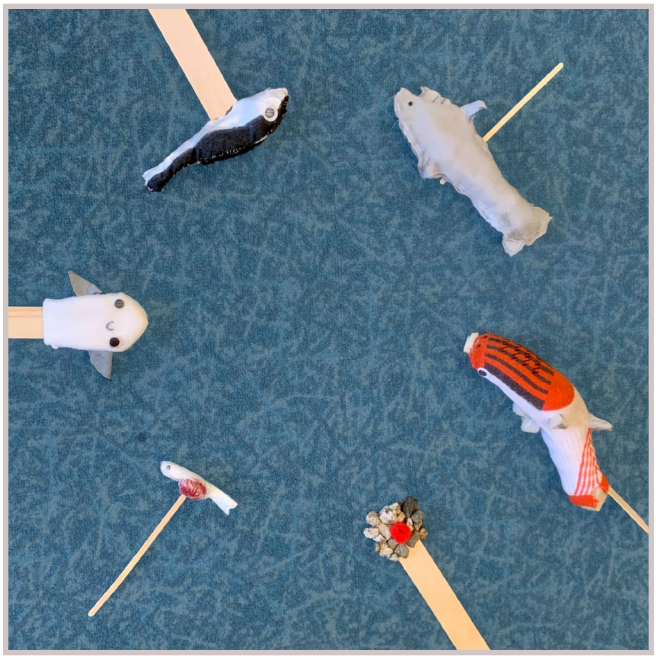
- Design and create a model or puppet that represents a part of the salmon life cycle (egg, eyed-egg, alevin, fry, smolt, adult, spawner).
- Determine skills and materials required for making the puppet.

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *ENBS - Salmon Life Cycle Puppets planning sheet* (RTF · DOCX · PDF)
  - » *ENBS - Salmon Life Cycle Puppets self-reflection* (RTF · DOCX · PDF)
- Student-created salmon life cycle poster from LESSON 2A
- Materials to create puppets, such as fabric, felt, socks, needles, thread, hot glue, large popsicle sticks, egg cartons, and recyclables.
- Photos of salmon at different points in the life cycle or internet access for inspiration.

Introduction

- Begin by introducing or reviewing the design thinking process.
- Divide the class into groups of 4–5 students and have students choose their part(s) in the salmon life cycle.
- Use the *ENBS - Salmon Life Cycle Puppets planning sheet* to help students plan out their prototypes for the creating a salmon life cycle puppet. Review and provide feedback (before constructing the puppet).



Activity

- Depending on the students' abilities and plans, use this opportunity to identify and learn new hand-sewing skills and stitches using the ADST (Applied Design, Skills and Technologies) textiles or arts education curriculum.
- Allow time for students to gather material and construct their salmon puppet protypers.
- Test the prototype for durability and have students seek peer feedback within their groups.

Assessment

- Have students reflect on the ADST competencies using the salmon puppet self-reflection.

Additional Resources

- Getting Started with Design Thinking: *https://dschool.stanford.edu/resources/getting-started-with-design-thinking*
- SUPPLIED SUPPLEMENT: *ENBS - Salmon Life Cycle Puppets hand stitches* (RTF · DOCX · PDF)

LESSON 2C

Salmon Life Cycle Script & Performance

Essential Question

How can I effectively perform the salmon life cycle using scientific information, a salmon life cycle puppet, and an engaging and informative script?

Objective

Students will be able to:

- Write about a particular role (egg, eyed-egg, alevin, fry, smolt, adult, spawner) and its perspective in the life cycle of the Pacific salmon.
- Work collaboratively within a small group (of 4–5 students) to write a script that describes the life cycle of the salmon and perform it to the class.

Materials & Preparation

- SUPPLIED SUPPLEMENT:
  - » *Theatrefolk - Self Assessment Checklist* (PDF)
- Student-created salmon life cycle poster and student notes from previous lessons
- Salmon puppet prototype from previous lesson
- Internet access for a shared Google Document

Introduction

- In the salmon puppet life groups, have students create a script discussing the parts of the salmon life cycle from the perspective of a salmon or a narrator. Encourage students to use details about the physical characteristics, habitat, and survival methods at each stage. (Brainstorm some examples as a class.)
- Instruct students to use elements of engaging, creative, and scientific writing in their scripts.

- Students can co-create the script in a shared Google Document or collaboratively in writing. Provide feedback for the first draft of the script.

Activity

- Highlight dramatic elements (from the BC Arts Education curriculum) including character, time, place, plot, tension, mood, and focus to help students express their learning and understanding of the life cycle in an entertaining way.
- Have students practice performing and rehearsing their scripts with their puppets.
- Perform the salmon life cycle to the rest of the class or larger audience.

Assessment

- Use *Theatrefolk - Self Assessment Checklist* to have students do a self-assessment.

Extensions

- Collaborate with your school's performing arts department to teach students about performing with expression, enthusiasm, and clarity.

LESSON 3

Salmon Urban Stream Design

In this lesson, classes are encouraged to visit a local stream in their neighbourhood or go to the location site where classroom salmonids will be released. Students will draw an aerial sketch of the urban stream and make note of the characteristics of the habitat that is necessary for salmon survival.

Essential Question

What stream habitat characteristics are necessary for salmon survival?

Objectives

Students will be able to:

- Draw a stream showing vegetation, animals, and structures that are necessary for salmon survival.
- Identify salmon habitat characteristics in the field.

Materials & Preparation

- SUPPLIED SUPPLEMENT:
  - » *ENBS - Urban Stream Design Sketching* (PDF)
- Pencils & erasers; or coloured pencils
- Clipboards

Introduction

- Remind students about the stream habitat necessary for the beginning and end stages of the salmon life cycle: What stream characteristics are necessary for salmon survival?
- Explain stream or park etiquette and safety, "leave no trace" guidelines, and boundaries for their aerial sketch.

Activity

- Students will draw an aerial sketch of the stream location and note the following features at the location: logs, riffles, rapids, pools, overhanging banks or cutbacks (evidence of erosion), rocks along shoreline, plants, and garbage or litter.
- Have students create a key of shapes and lines to identify features and characteristics of the stream, record the location, date, weather, etc.

Assessment

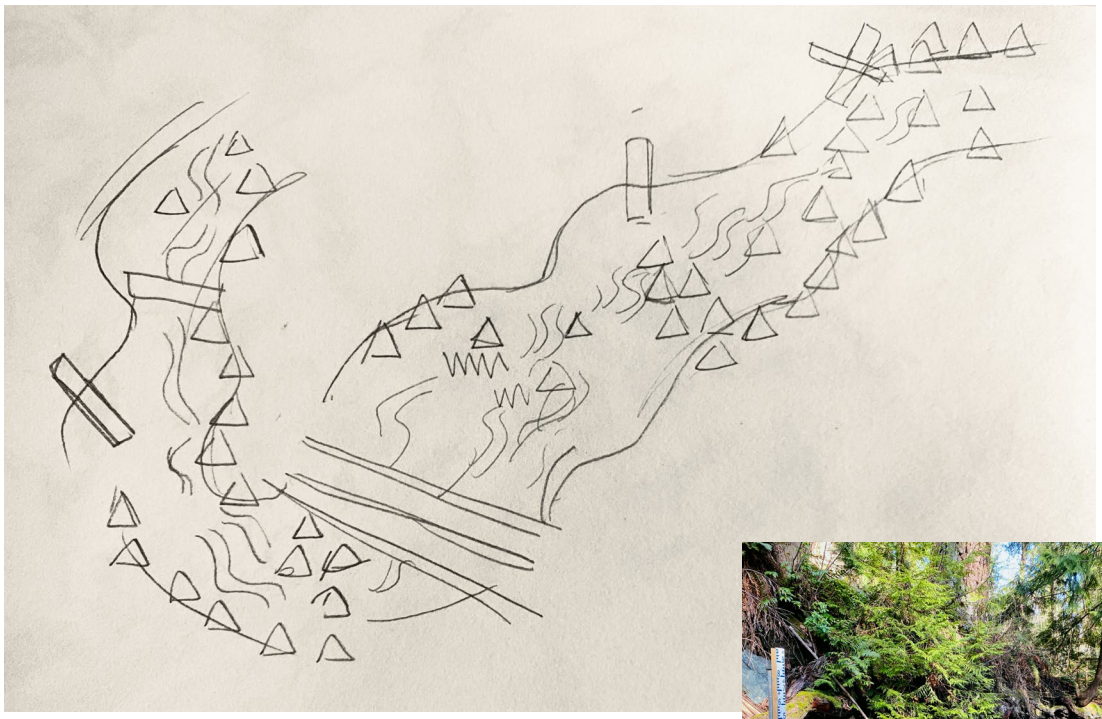
- Have each student write a short paragraph explaining if they think this stream location is ideal for salmon in the early/end stages of their life cycle or a good release site for salmonids in the classroom, and include any other information they need to know.

Extensions

- Conduct an entire stream survey investigation including water quality parameters such as measuring temperature, dissolved oxygen, and turbidity, and identifying plants and invertebrates.
- Adapt Activity 3.4 Water Sampling Investigation from FNESC's *Science First Peoples Teacher Resource Guide (SECONDARY) (2019)* on pages 95–96 and 105–110. This guide is available for free from *https://www.fnesc.ca/sciencetrg/*
- Investigate Indigenous salmon habitat sustainability such as limiting the number of fish they take at a specific location, understanding the capacity and history of the river or stream, restoring salmon spawning habitats (such as clearing obstructions from streams to allow salmon to swim upstream), and advocating for salmon populations and watershed protection (read more at FNESC's *Salmon and Interconnectedness*, *https://www.fnesc.ca/wp/wp-content/uploads/2019/08/3.6-Salmon-and-Interconnectedness-1.pdf*).

Additional Resources

- Visit Pacific Salmon Foundation's *Salmon Spotting* map to locate spawning salmon run in rivers and streams of British Columbia: *https://psf.ca/salmonspotting/#map*



KEY:


log


riffle


rapid


rocks along shoreline


overhanging banks or cutbacks (evidence of erosion)


plants


garbage or litter

Urban stream design sketching at Douglas Creek at PKOLS (Mount Douglas Park) in Victoria, BC (by student Kelly Li)

LESSON 4

Urban Stream Design Challenge

This lesson can be a 45-minute design challenge using Lego or Play-Doh (or clay), or a multi-day project that explores the design thinking process in more depth and allows students time to build a digital prototype or by using wood, recyclables, etc. Students will have built background knowledge on design thinking through classroom discussions, activities, and STEM challenges prior to this lesson.

Use a local stream in your design brief, or explore the case study of Bowker Creek Initiative restoration project and Chum Salmon Recovery project in Victoria, BC, to set up the environmental issues of the stream and outline the design problem. Alternatively, scaffold this design challenge to have students design a rain garden at a nearby stream by learning about Bowker Creek's rain gardens: *https://bowkercreek.org/1000-rain-gardens/why/*

Essential Question

How can your design improve the survival of salmon in an urban stream?

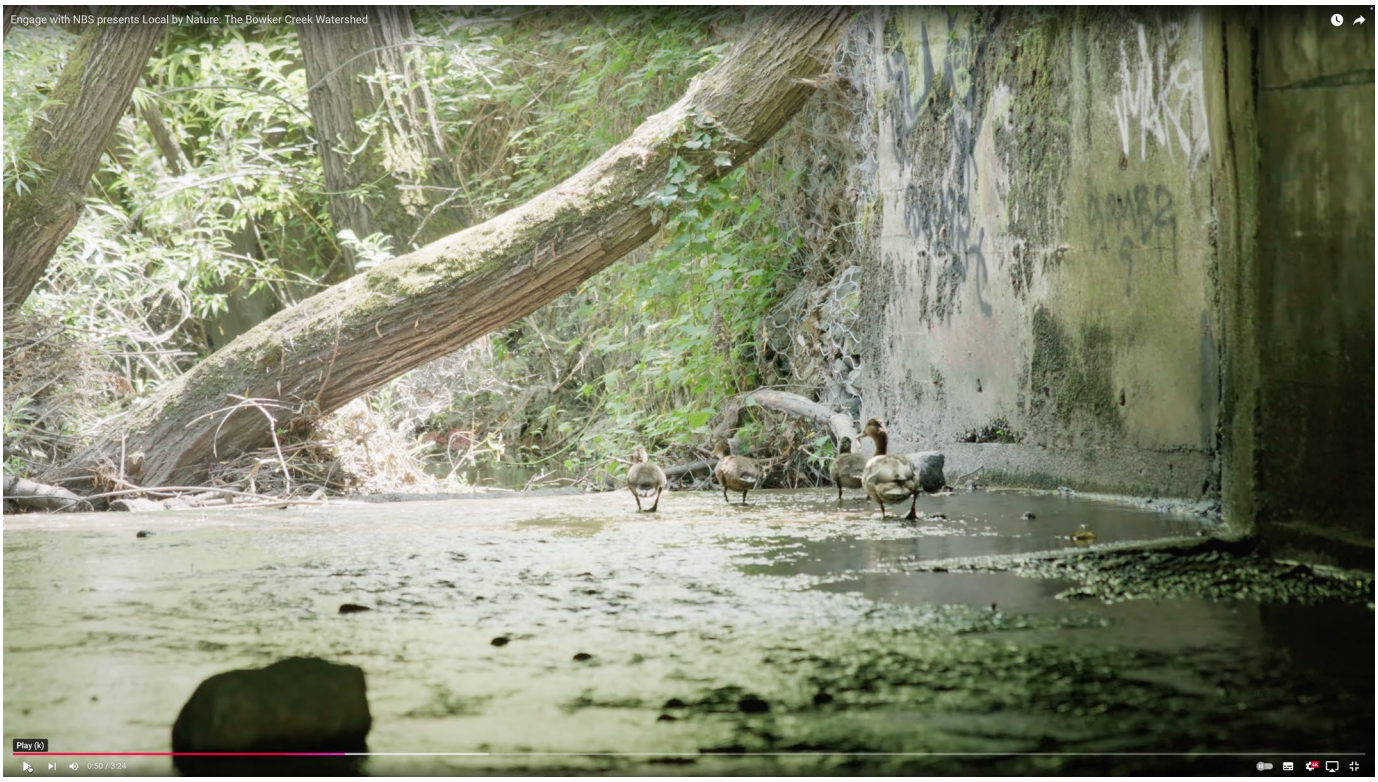
Objctive

Students will be able to:

- Collaboratively design and construct a prototype using the design process to address a threat to a salmon stream habitat.

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *ENBS - Salmon Stream Solutions design brief* (RTF · DOCX · PDF)
  - » *ENBS - Salmon Stream Solutions design challenge map* (RTF · DOCX · PDF)
  - » *ENBS - Salmon Stream Solutions self & teacher evaluation* (RTF · DOCX · PDF)
- Access to materials for building prototypes such Play-Doh (or clay), Lego, wood pieces, tools, recyclables, hot glue, etc

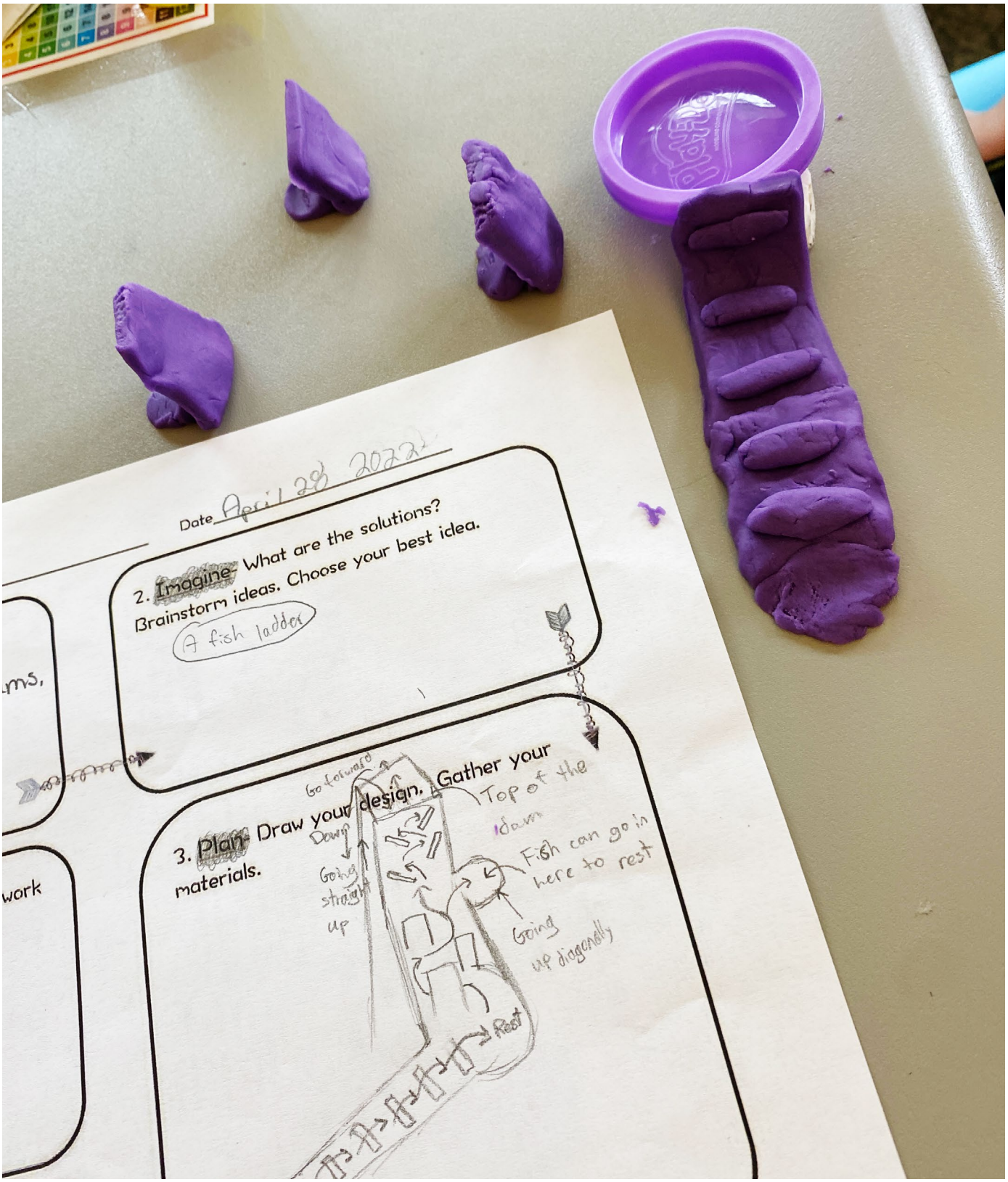


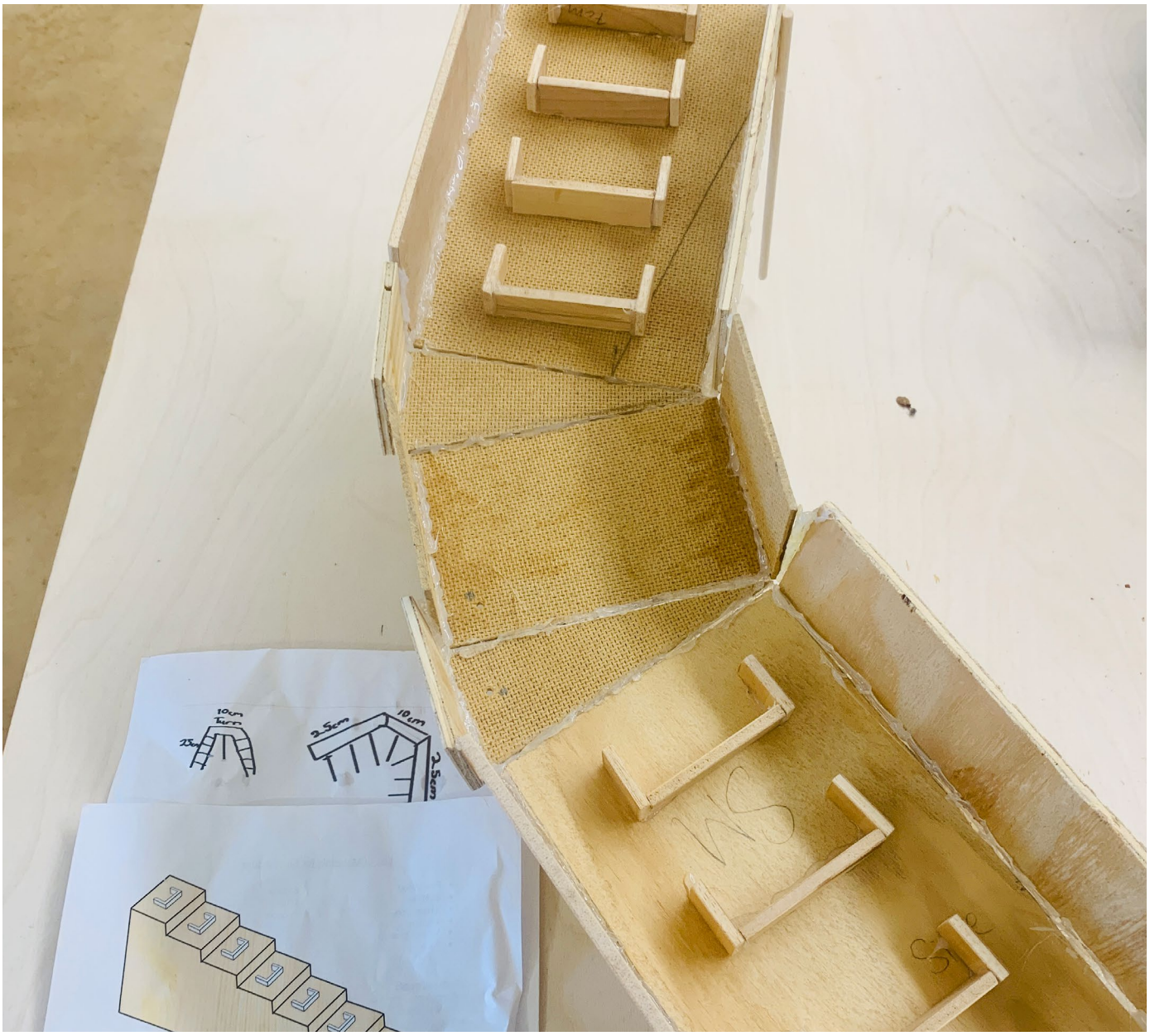
Introduction

- Provide background information regarding the environmental concerns of Bowker Creek including stream channel degradation, impervious surfaces, habitat loss and degradation, poor water quality, pollution, flooding and safety, and invasive species.
- Watch (3 minute) *Local by Nature: The Bowker Creek Watershed* to provide an example of how rain gardens can reduce threats to this salmon habitat: *https://youtu.be/3Ho3jborUew*

Activity

- Introduce the design brief to address a threat to a salmon stream habitat and collaborative design project. Specify that students should focus on addressing one of the concerns in their innovation. Examples include a run-off filtration system, a litter catcher, a habitat restoration system, flooding prevention, or a salmon egg protective box.
- Have students begin by filling out their own *ENBS - Salmon Stream Solutions design challenge map* before collaborating on ideas and sketching their prototype with labels.
- Provide access to materials based on their planning sheets and time to build prototypes.


Date April 28 2022
2. Imagine What are the solutions? Brainstorm ideas. Choose your best idea.
A fish ladder
3. Plan Draw your design. Gather your materials.
Go forward
Down
Going straight up
Top of the dam
Fish can go in here to rest
Going up diagonally
Rest



Assessment

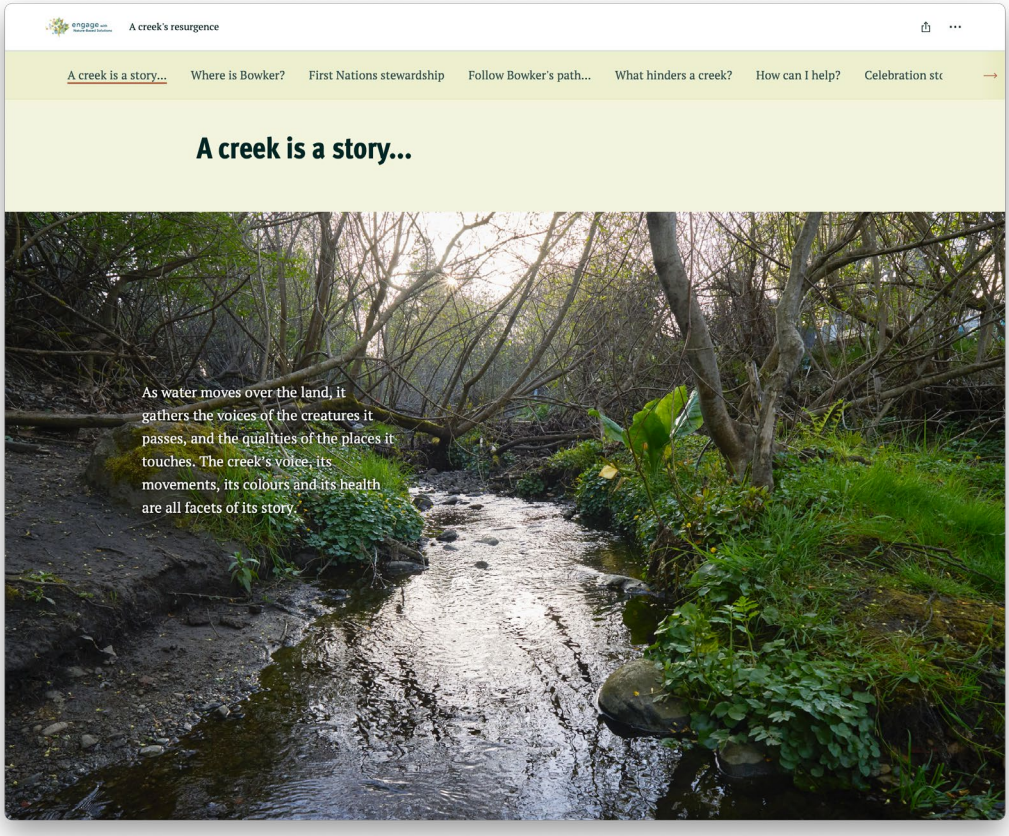
- Conduct a gallery walk to share prototypes or present innovations with the whole class.
- Have students complete the self-evaluation and provide teacher feedback onto the *ENBS - Salmon Stream Solutions self & teacher evaluation*.

Extensions

- Visit a local stream and have students observe or inquiry into environmental concerns associated with the stream.
- Modify this design challenge to specifically address dams in British Columbia's watersheds that can alter the natural habitat of fish and have students design a fish ladder prototype.

Additional Resources

- *(shown below)* Engage with Nature-based Solutions Story Map of Bowker Creek: *https://engagewithnbs.ca/community-story/bowker-creek/*
- Friends of Bowker Creek Society: *https://bowkercreek.org/*
- Bowker Creek Initiative from the CRD: *https://www.crd.bc.ca/bowker-creek-initiative*
- (3 minute) *Vital People: Bowker Creek* video: *https://youtu.be/dNFG0_o07WQ*



LESSON 5

Be an Environmental Steward to Protect Salmon in Urban Streams

Use the United Nations' Sustainable Development Goals (SDGs) (*https://sdgs.un.org/goals*) and specifically Goal #14 Life Below Water to bring awareness to protecting our oceans, rivers, lakes, and streams to encourage your students to be environmental stewards and advocates. The World's Largest Lesson resources (*https://worldslargestlesson.globalgoals.org*) are a good place to start if your students are new to learning about the SDGs. Students will read a superhero comic about protecting life below water and then create their own comic book or story map to bring awareness to protecting salmon habitat in urban streams.

Essential Question

How can we be environmental stewards and tell a story to protect salmon in urban streams?

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *ENBS - Urban Stream Comic story rubric* (RTF · DOCX · PDF)
  - » *Global Goals - Annie Sunbeam comic 1* (PDF)
- Internet access, computer, projector, speakers
- Students computers or paper
- Samples of comics or graphic novels

Objectives

Students will be able to:

- Understand the importance of the SDGs and protecting life below water.
- Design a comic story for educating the public about how protecting, preserving, and restoring urban streams can help salmon and urban stream problems.

Introduction

- Introduce the United Nations' Sustainable Development Goals using the World's Largest Lesson resources and focus on Goal #14 Life Below Water (30 minute lesson plan): *https://worldslargestlesson.globalgoals.org/resource/introducing-the-global-goals/*
- Read *Global Goals - Annie Sunbeam comic 1* that brings awareness to protecting oceans and marine species.

Activity

- Remind students about the parts of a comic and have students break down the *Global Goals - Annie Sunbeam comic 1* or other samples.
- Use a story map template for students to:
  - » Plan a beginning, middle, and end of their comic story.
  - » Make connections to Goal #14 Life Below Water.
  - » Bring awareness to specific environmental issues in urban streams or salmon habitat.
  - » Select a scene to portray an urban stream.
  - » Develop characters like a superhero, interplanetary being, animal, or themselves!
  - » Solve a problem and work towards protecting or restoring urban streams.
- Create a good copy of their comic using paper, website, or applications (*https://www.commonsense.org/education/lists/classroom-friendly-websites-and-apps-for-making-comics*)
- Encourage students to share their comic story with family, friends, and peers to raise awareness.

Assessment

- Use the *ENBS - Urban Stream Comic story rubric* to evaluate the students' comic.

Extension

- Connect your class with a local organization that protects and restores urban streams. Volunteer to help pull invasive species, clean up litter, restore riparian zones, and learn more about how to help clean your local streams.

LESSON 6

Urban Stream Town Hall

This culminating project allows students to take on the role of an interested party or stakeholder to share a perspective about their connection to the environment, human impact, or business plans near a local urban stream. They will produce visuals to demonstrate their learning and an oral presentation that they will share in the Town Hall Meeting.

Essential Question

How might the impacts on an urban steam be considered from the perspective of an interested party?

Objective

Students will be able to:

- Observe the First Peoples' concepts of interconnectedness in the environment.
- Examine the nature of sustainable practices and human impacts around BC's living and non-living resources.
- Explore stories and a variety of texts to help build their understanding of an interested party and their relation to an urban stream.
- Recognize different perspectives and extend their own thinking as evidenced by listening, presenting, and answering questions at a town meeting.
- Represent and share their information and perspective using a variety of media.

Materials & Preparation

- SUPPLIED SUPPLEMENTS:
  - » *ENBS - Town Hall Meeting for a Local Urban Stream* (RTF · DOCX · PDF)
  - » *RWT - Town Hall Meeting guide* (PDF)
  - » *RWT - KWL Chart* (PDF)
- Introduction or background information about a local urban stream

- Internet access, computer, projector, speakers
- Google Drive with shared student Google Document or folders for individual student work

Introduction

- Share a video, article, or news report regarding interests or concerns of a local urban stream or river.
- Define and discuss the purpose of a town hall meeting:
    - » Read *RWT - Town Hall Meeting guide*: "A town hall meeting is an informal arena where citizens can voice their opinions on issues that affect the community at large. Everybody is welcome, but people invested in the issue are usually the ones who express their concerns and vocalize objections. The primary purpose of these meetings is to get feedback, whether positive or negative, from concerned citizens … Town hall meetings also foster diverse opinions, authentic communication, mutual understanding, and transparency between organization and citizen."
- As a class, brainstorm a list of concerns, positive and negative impacts, and interested parties in relation to the urban stream, such as: fishing, hydro power, tourism, water testing and management, farming, logging, urban development, contractors, river health, historical settlements, Traditional Knowledge, biodiversity, wildlife, erosion, hatcheries, invasive species, transportation, and outdoor pursuits like paddling or camping.
- Have students briefly research and identify three interested parties on a Post-It note that they are interested in developing perspectives for this assignment. Assign a variety of interested parties within the class.

Activity

- Discuss the *ENBS - Town Hall Meeting for a Local Urban Stream* assignment criteria with the class using the handout to outline guiding questions and tasks.
- Use the *RWT - KWL Chart* as a graphic organizer to help students gather their information about their interested party.
- Scaffold the assignment by providing an example of an interested party and guide students through the Indigenous perspectives of interconnectedness in relation to their local stream.
- Over the course of several work periods, have students research and prepare their visuals and presentations for the Town Hall Meeting.
- Students that finish early can practice presenting with a partner.

- Conduct Town Hall Meeting over 1–2 sessions where students deliver their presentation, respond to the audience's questions, and make connections between interested parties.

Assessment

- Following the Town Hall Meeting, have students respond to the following prompts:
  - » Write a short paragraph reflection on what interested party (other than your own) would you now support and why.
  - » Do you think this interested party/stakeholder could improve your relationships with others in this watershed?
  - » How have your ideas/beliefs changed since the beginning of this project?
  - » How has this project changed the way you think about urban streams and rivers?
- Complete the Urban Stream Town Hall Rubric at the end of the assignment document.

Extensions

- Invite community members at the beginning of the project to share about their connections and perspectives regarding a local urban stream.
- Help students make connections to community members to conduct interviews to further develop their perspectives of their interested parties.
- Invite community members to do the Town Hall meetings and student presentations.
- Conduct a Fraser River Town Hall Meeting as a larger watershed with more interested parties:
  - » Watch (4 minute) drone footage of the canyon: *https://youtu.be/AXfVZ7CdXSY*
  - » Global News: BC First Nations aims for tourism hub with new $3.8M restaurant, gas station (2022): *https://globalnews.ca/news/8906422/first-nations-soda-creek-xatsull-business/*
  - » Explore the self-guided, virtual learning experience all about the Fraser Watershed created by the Rivershed Society of BC and discover the three pillars of Watershed CPR—Connect, Protect, and Restore: *https://rivershed.com/connect/watershed-cpr-education-program/*
  - » Fraser River Discovery Centre - Teacher Resource with extensive unit: *https://fraserriverdiscovery.org/wp-content/uploads/2021/12/MRMH-ResourceKit2021-Update.pdf*

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