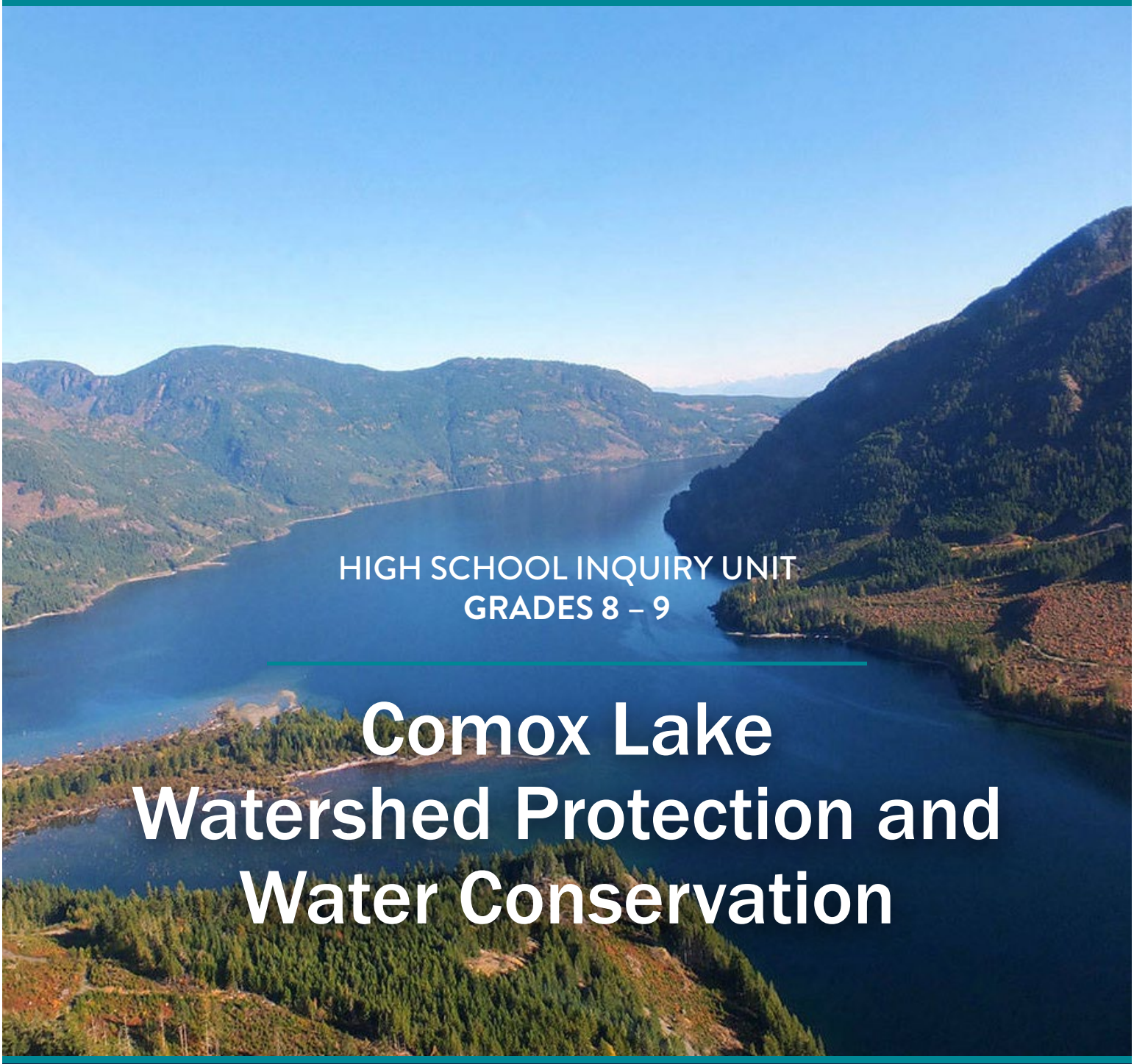
Connected by Water

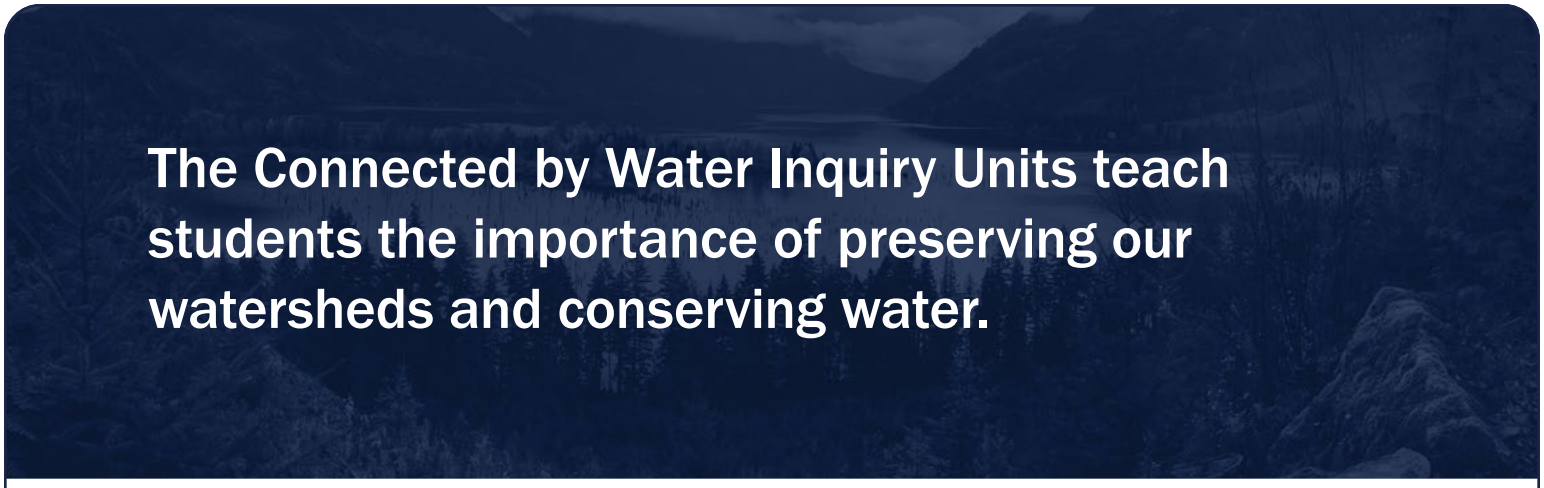


HIGH SCHOOL INQUIRY UNIT
GRADES 8 – 9

Comox Lake Watershed Protection and Water Conservation

FOR MORE INFORMATION, VISIT:
WWW.COMOXVALLEYRD.CA/WATERSHED

Comox Valley
REGIONAL DISTRICT



The Connected by Water Inquiry Units teach students the importance of preserving our watersheds and conserving water.

High quality drinking water is produced by a healthy, properly functioning ecosystem. To have healthy water you need healthy ecosystems. Protecting our drinking water requires protecting its source and practicing water conservation. The Comox Valley Regional District (CVRD) has developed these materials to support students in learning about their connections to the Comox Lake watershed, learning what makes a watershed healthy, and learning how to conserve water by using it efficiently at home. Our watershed is the entire area of land in which our drinking water flows, including streams, rivers, lakes, groundwater and shorelines.

See **www.comoxvalleyrd.ca/watershed** for more detail about the Comox Lake watershed.

The following resources are informed by the Watershed Protection Plan, and the Connected by Water project vision, all within the framework of the British Columbia Ministry of Education Curriculum. They are designed to support answering the driving question: **What allows me to have safe water that I can drink?**

An additional Connected by Water inquiry unit is available for intermediate grades (Grades 4-7), High School, (Grades 8-9) as well as a Water Treatment Inquiry Unit (Grades 6-9).

More information is available at:
https://www.comoxvalleyrd.ca/watershed/resources-educators

Corresponding learning kits are available through the School District 71 (SD71) High School Library system.

The project team would like to thank SD71's Learning Resource Centre team, Indigenous Education team, Assistant Superintendent Geoff Manning, as well as the long list of local environmental educators listed in the Additional Resources appendix. These educators include SD71 teachers who have provided feedback and tested the materials. The Comox Valley Regional District provided funding and project direction. These materials were developed by Christina (Tina) Willard-Stepan, curriculum development and delivery member of the Connected By Water team, with contributions by Angela Holmes, Meaghan Cursons, Lyndsay Fraser, Zoe Norcross-Nu'u, and Will Cole-Hamilton. In addition, a special thanks to SD71 teachers Judith Wright and Serina Allison for reviewing materials and for general support for this project.

Together we are creating a legacy of acting together to ensure the health and long-term viability of our communities through using our drinking water wisely, and protecting the source of our drinking water. We respectfully acknowledge that we live, work, learn and play on the unceded traditional territory of the K'ómoks First Nation.

Tables of Contents

Introduction to Educators

HOW TO USE THIS INQUIRY UNIT

Welcome to the Connected by Water Teacher Resource!

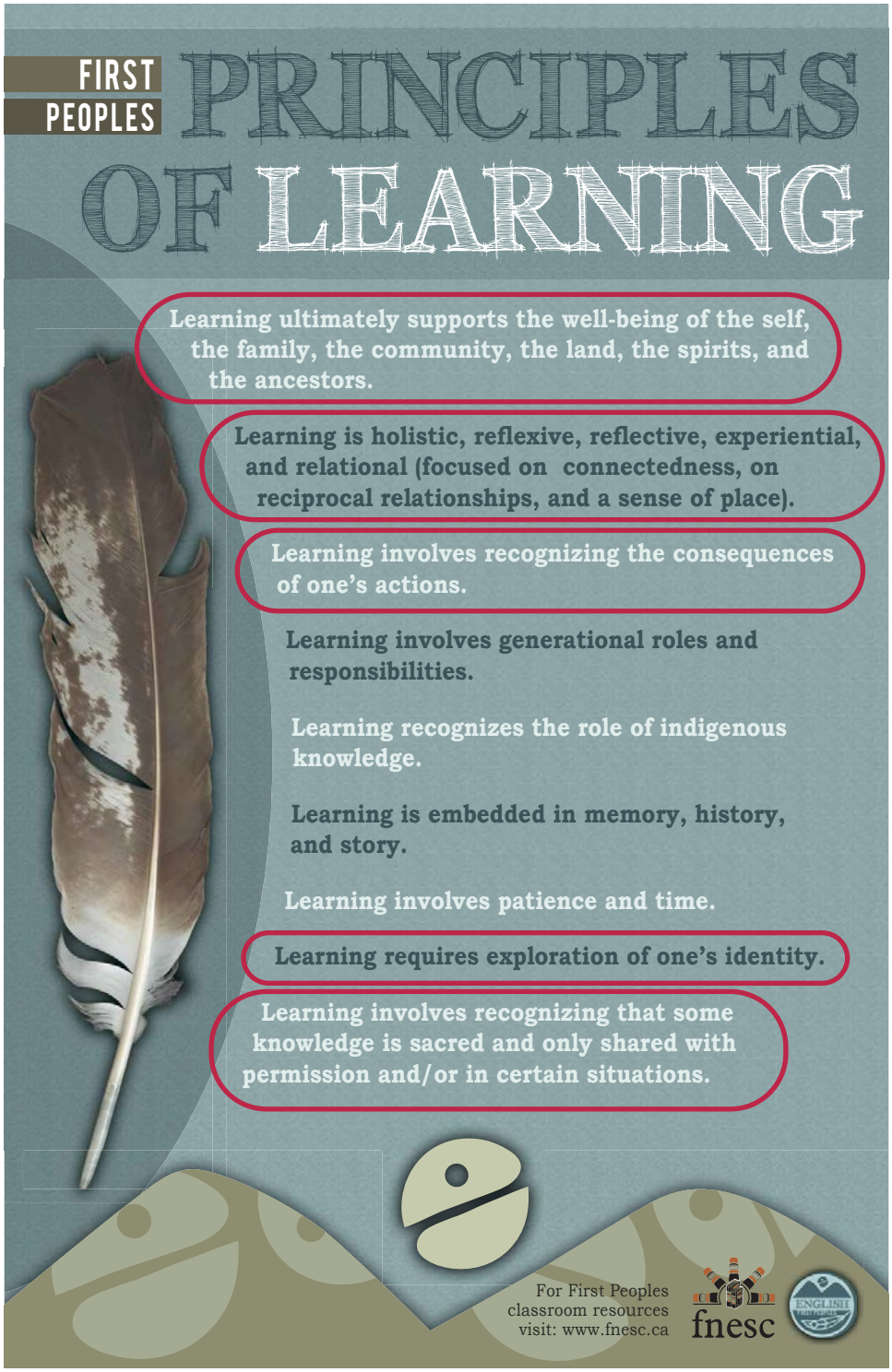
This Inquiry Unit can be used in its entirety, or each activity can stand alone and lead to exploration of further inquiry.

The end of this document includes a very robust list of additional links and resources connecting you to many ideas and projects in the community, including options for field trips. Consider integrating the unit while your school is working on social themes such as sustainability, Earth Day, or social responsibility.

These materials can be downloaded, and there are also physical inquiry kits available to reserve for School District 71 teachers through your library system. These include copies of the books referred to within the lessons, as well as other supporting materials. There is a primary inquiry kit, intermediate inquiry kit, a High School inquiry kit, and a Water Treatment Inquiry for grades 8-9.

www.comoxvalleyrd.ca/watershed/teacherresources

The Connected by Water Inquiry Unit is most aligned with the five circled First Peoples Principles of Learning.



This Inquiry Unit and British Columbia's Curriculum

CORE COMPETENCIES

The BC Ministry of Education explains that Core Competencies, literacy and numeracy, and essential concepts and content are the foundations of the curriculum. Students will know, do and understand "Big Ideas" and what to do with this knowledge as they move from Kindergarten to Grade 12. Core competencies are sets of intellectual, personal, and social proficiencies that all students need to develop in order to engage in deep learning and lifelong learning.

Watch this video for a refresher on the Core Competencies.

An aim of the Connected by Water Inquiry Units is to teach students the importance of preserving our watersheds and conserving water. Tying the inquiry units to the core competencies allows students to gain an awareness and understanding of their watershed, take action to conserve and protect their watershed, and learn to use drinking water wisely. Listed below are some of the core competencies and curricular connections that are interwoven and interrelated in the Connected by Water Inquiry Units.

This Inquiry Unit and British Columbia's Curriculum

CORE COMPETENCIES

https://curriculum.gov.bc.ca/competencies

This Inquiry Unit and British Columbia's Curriculum

SOCIAL STUDIES

GRADE 8	
BIG IDEA	· Human and environmental factors shape changes in population and living standards. · Exploration, expansion, and colonization had varying consequences for different groups.
CURRICULAR COMPETENCIES	· Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions. · Assess the credibility of multiple sources and the adequacy of evidence used to justify conclusions. · Explain different perspectives on past or present people, places, issues, or events, and compare the values, worldviews, and beliefs of human cultures and societies in different times and places.
CONTENT	· Interactions and exchanges of resources, ideas, arts, and culture between and among different civilizations · Changes in population and living standards.

GRADE 9	
BIG IDEA	· The physical environment influences the nature of political, social, and economic change. · Disparities in power alter the balance of relationships between individuals and between societies.
CURRICULAR COMPETENCIES	· Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions.
CONTENT	· Physiographic features of Canada and geological processes.

SCIENCE

GRADE 8	
BIG IDEA	· The theory of plate tectonics is the unifying theory that explains Earth's geological processes.
CURRICULAR COMPETENCIES	· Experience and interpret the local environment. · Apply First Peoples' perspectives and knowledge, other ways of knowing, and local knowledge as sources of information. · Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies. · Construct, analyze and interpret graphs (including interpolation and extrapolation), models and/or diagrams. · Analyze cause-and-effect relationships. · Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources. · Consider social, ethical, and environmental implications of the findings from their own and others' investigations. · Express and reflect on a variety of experiences and perspectives of place.

GRADE 9	
BIG IDEA	· The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them.
CURRICULAR COMPETENCIES	· Experience and interpret the local environment. · Apply First Peoples' perspectives and knowledge, other ways of knowing, and local knowledge as sources of information. · Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies. · Construct, analyze and interpret graphs (including interpolation and extrapolation), models and/or diagrams. · Analyze cause-and-effect relationships. · Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources. · Consider social, ethical, and environmental implications of the findings from their own and others' investigations. Express and reflect on a variety of experiences and perspectives of place.

This Inquiry Unit and British Columbia's Curriculum

ARTS EDUCATION

GRADE 8	
BIG IDEA	· Dance, drama, music, and visual arts are each unique languages for creating and communicating. · Artists often challenge the status quo and open us to new perspectives and experiences.
CURRICULAR COMPETENCIES	· Explore relationships between identity, place, culture, society, and belonging through arts activities and experiences. · Use the arts to communicate, respond to and understand environmental and global issues.

GRADE 9	
BIG IDEA	· Creative arts experiences can build community and nurture relationships with others. · Dance, drama, music, and visual arts are each unique languages for creating and communicating.
CURRICULAR COMPETENCIES	· Explore relationships among identity, place, culture, society, and belonging through arts activities and experiences.

ENGLISH LANGUAGE ARTS

GRADE 8	
BIG IDEA	· Exploring stories and other texts helps us understand ourselves and make connections to others and to the world. · Texts are socially, culturally, and historically constructed. · Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens.
CURRICULAR COMPETENCIES	· Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability. · Apply appropriate strategies to comprehend written, oral, and visual texts, guide inquiry, and extend thinking. · Synthesize ideas from a variety of sources to build understanding. · Think critically, creatively, and reflectively to explore ideas within, between, and beyond texts. · Construct meaningful personal connections between self, text, and world. · Use writing and design processes to plan, develop, and create engaging and meaningful literary and informational texts for a variety of purposes and audiences.

GRADE 9	
BIG IDEA	· Exploring stories and other texts helps us understand ourselves and make connections to others and to the world. · Texts are socially, culturally, and historically constructed. · Questioning what we hear, read, and view contributes to our ability to be educated and engaged citizens.
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This Inquiry Unit and British Columbia's Curriculum

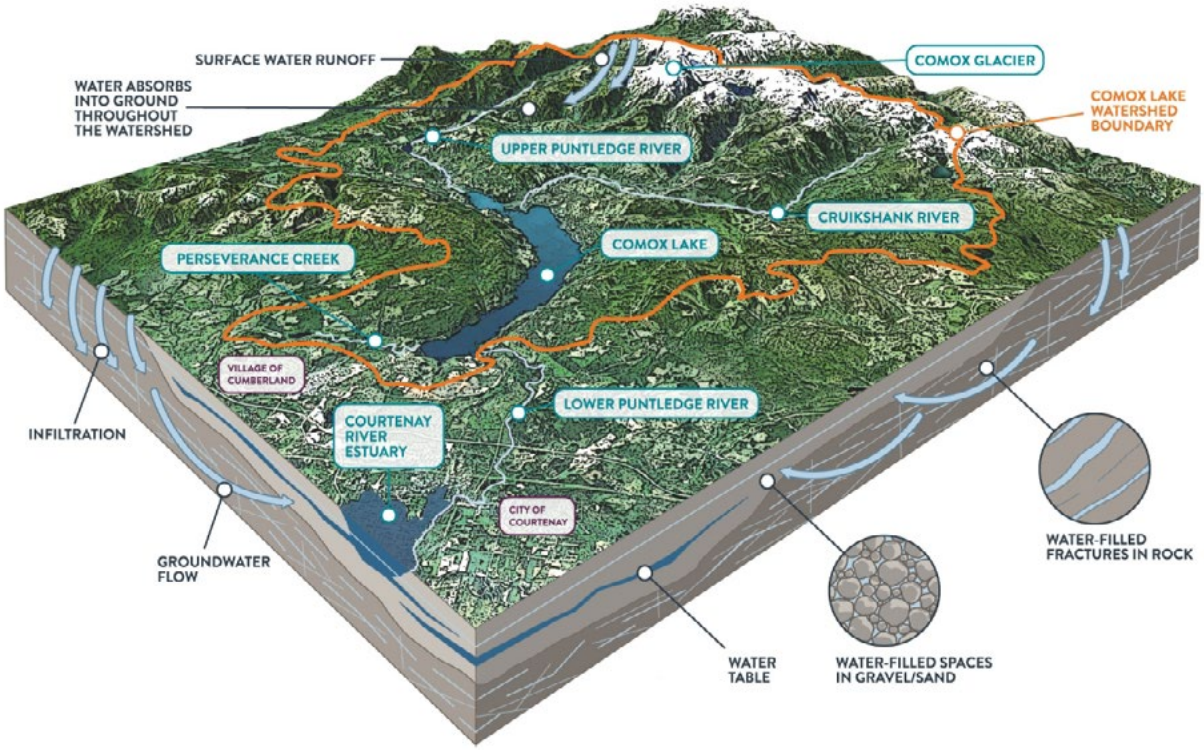
CAREER EDUCATION

GRADE 8	
BIG IDEA	· The value of work in our lives, communities, and society can be viewed from diverse perspectives. · Our career paths reflect the personal, community, and educational choices we make.
CURRICULAR COMPETENCIES	· Recognize and explore diverse perspectives on how work contributes to our community and society. · Explore volunteer and other new learning experiences that stimulate entrepreneurial and innovative thinking.

GRADE 9	
BIG IDEA	· The value of work in our lives, communities, and society can be viewed from diverse perspectives. · Our career paths reflect the personal, community, and educational choices we make.
CURRICULAR COMPETENCIES	· Recognize and explore diverse perspectives on how work contributes to our community and society. · Explore volunteer and other new learning experiences that stimulate entrepreneurial and innovative thinking.

The Comox Lake Watershed

The Comox Lake watershed is located in the traditional territory of the K'ómoks First Nation and provides drinking water for the Comox Valley water system. This watershed is an interconnected system of mountains, forests, rivers, creeks and streams and an ecological corridor that links Vancouver Island mountains with the Salish Sea.

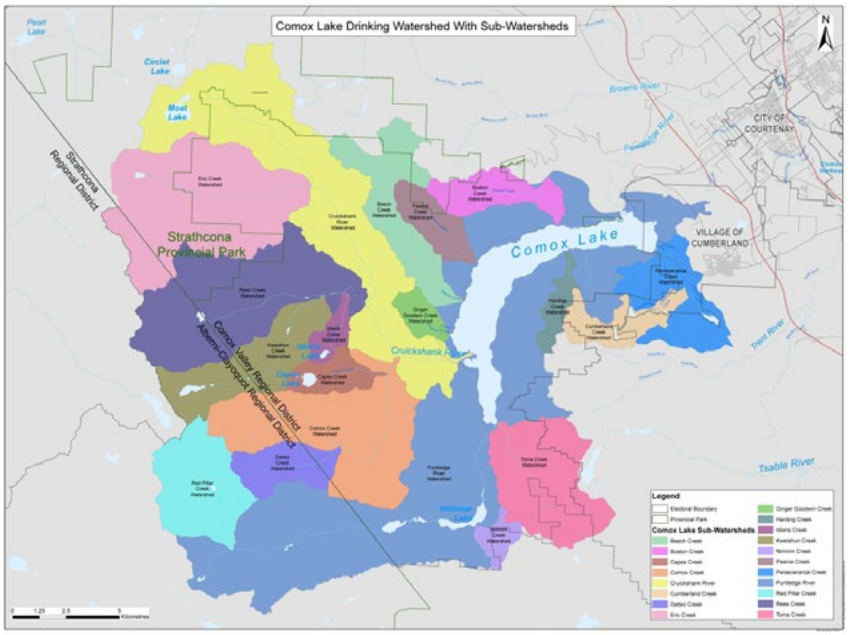


www.comoxvalleyrd.ca/watershed

The watershed is 461 square kilometres in size and reaches to the top of the Comox Glacier and the mountains surrounding Comox Lake. Within the Comox Lake watershed there are multiple sub-basins named for the creeks and rivers that flow through them. These include the Upper Puntledge, Cruikshank, Boston Creek and Perseverance Creek sub-basins. Much of the water that hits the ground as snow or rain anywhere in the Comox Lake watershed eventually flows into Comox Lake.

The Comox Lake Watershed

The Comox Lake watershed has been managed for multiple values including mining, logging and recreation activities for over 140 years. While coal mining operations ended in the 1930's, a large portion of the watershed is still currently privately owned and managed for timber supply. Comox Lake itself is a reservoir controlled by BC Hydro for power generation. Swimming, boating and camping also takes place but public access is limited to specific sites at the east end of the lake.



www.comoxvalleyrd.ca/watershed

The watershed also provides important habitat for fish and wildlife including species at risk like the Roosevelt elk, little brown bat and northern red-legged frog. Comox Lake flows into the Puntledge River providing stream flows that support many species of salmon.

Other landowners within the watershed include the Village of Cumberland (Perseverance Creek sub-basin, Cumberland Lake Park), Comox Lake Land Corporation (cabin owners at east end of lake), the Comox Valley Regional District (Coal Beach), the Courtenay and District Fish and Game Society and BC Parks (Strathcona Park and Comox Lake Bluffs Ecological Reserve).

The Comox Lake watershed is the source of drinking water for over 49,000 residents of the Comox Valley through the Comox Valley Water System and the Cumberland Water System. Although the Comox Valley Regional District (CVRD) is constructing a new water treatment plant, the cost of treating our drinking water will be directly related to the quality of water that is drawn from Comox Lake.

View this short video **Watershed for Beginners: How to Care for Comox Lake**.

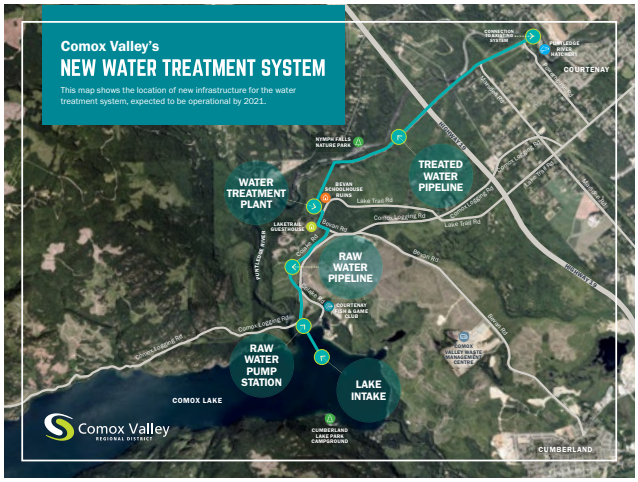
The Comox Lake Watershed

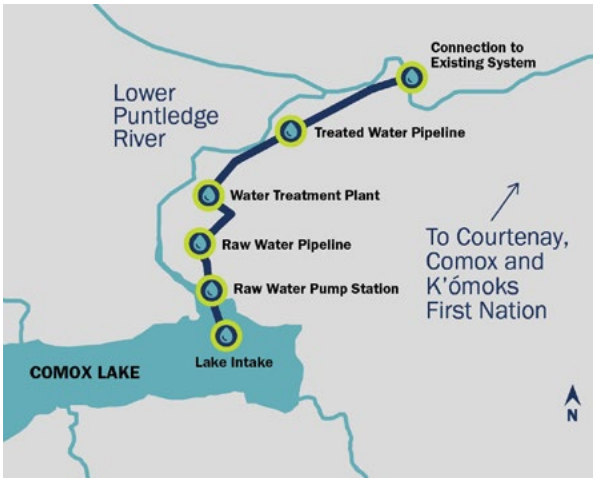
The following image includes themes around what makes a healthy, climate resilient watershed: functioning creeks and streams, ecosystem health , fire protection, clean water, water conservation, and connection to place. The activities following will help you to generate meaningful conversations with your participants in keeping with these themes.

Water Treatment

New Water Treatment Facility Complete, Providing High Quality Drinking Water to Comox Valley Residents.

Fresh, filtered and fully disinfected drinking water is now flowing to 50,000 residents in the Comox Valley – an achievement celebrated with an event on September 21, 2021 at the Comox Valley Regional District's new Water Treatment Facility on Lake Trail Road.





ABOUT THE PROJECT

Construction of the Comox Valley Water Treatment Project is now complete. The new system, which began construction in fall 2019, now provides a safe, reliable source of drinking water that meets provincial surface water treatment objectives guidelines. The completion of this system means:

- Elimination the need for turbidity-related boil water notices.
- Removal the risk of viruses and bacteria in our drinking water
- A secure supply of reliable, high quality drinking water for decades to come

Introduction to the Inquiry

An inquiry unit is often launched with an invitation or a provocation. Students' questions about the phenomena they are experiencing through their senses are placed at the centre of the learning.

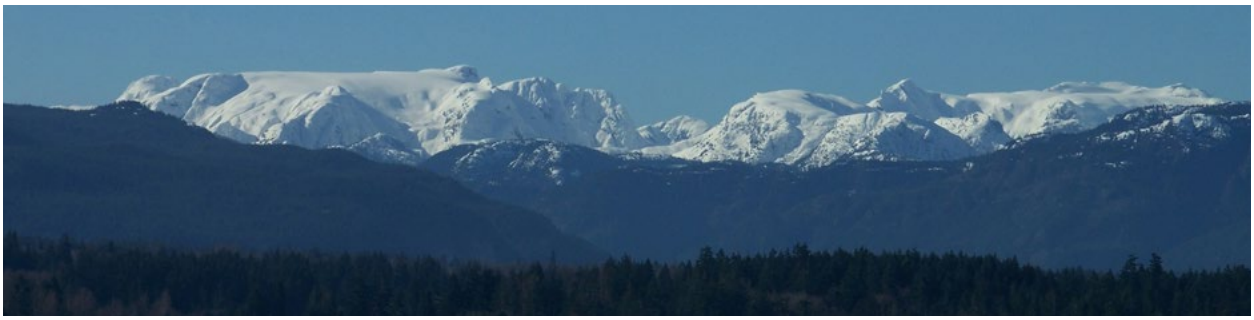
In our rainy "wet coast" we seem to have lots of water. It is hard to imagine that the truth is we do not. If all the water on Earth is connected by the water cycle, we essentially have one big shared source of water. Every living organism on the planet needs water. That is a lot of life to support!

All water on earth is connected - let's call it a global well. This global well includes oceans, icecaps and glaciers, groundwater, lakes, inland saltwater seas, moisture in the soil, water in the atmosphere and rivers. This global well feeds our local Comox Lake watershed, and all other watersheds/water sources that all people, plants and animals use for daily activity and their survival.

Driving question: What allows me to have safe water that I can drink?

Launching the Inquiry

ACTIVITY:
THE LEGEND OF QUENEESH



Read aloud the Local K'ómoks Nation Legend of Queeneesh with the class (see Appendix 1) or show the student-made video of the storytelling from this link:

Legend of Queneesh

Observing and Supporting Learning
Prompting questions for your inquiry:

- What do you know about the Comox Glacier?
- How is water important in the K'ómoks Nation?
- How do they use resources from the watershed to help them?

DRIVING QUESTION

What allows me to have safe water that I can drink?

LEARNING ACTIVITY:

Show this picture of water faucet.
Place a clear glass of water at the front of the class.

Observing and Supporting Learning
Prompting questions for your inquiry:
What are you thinking? Noticing? Wondering?

Connection and Awareness

ACTIVITY:
STARTING THE CONVERSATION

Use the quotes, questions and quiz below to gauge students' knowledge about water, sustainability and climate resilience, and to support the group in entering into the inquiry from a place of curiosity. Post quotes onto board or read aloud. For larger groups, have them share in pairs before returning to the whole class for discussion.

POP QUIZ - How long can you live without the following:

Food?	3 weeks
Electrical power?	Weeks to years
Cell phone?	indefinitely
Water?	3 days

"It is almost unimaginable that an object or thing, natural or unnatural, is not owned or controlled by a private person, organization, or government."
—Jonathan Leeming, Conservationist, One World

"The question of how much we impact the environment can be tough to answer, simply because we are rarely aware of the consequences of our actions."
—Jonathan Leeming, Conservationist, One World

"For many of us, clean water is so plentiful and readily available that we rarely, if ever, pause to consider what life would be like without it."
—Marcus Samuelsson

"Some people think that humans were put on the earth to dominate, abuse and use it as we see fit."
—Jonathan Leeming, Conservationist, One World

Prompting questions for your inquiry:

Can you name an aspect of the environment that is not owned or controlled by a private person, organization or government? Do you know who owns our watershed?
See page 9 of this resource.

How do you think your actions in your everyday life might affect our local watershed and water conservation?

What would be different about your life if we did not have enough water for all of our current needs?

Do you think that humans have a responsibility to look after the environment?

ACTIVITY:
WATER CYCLE REVIEW

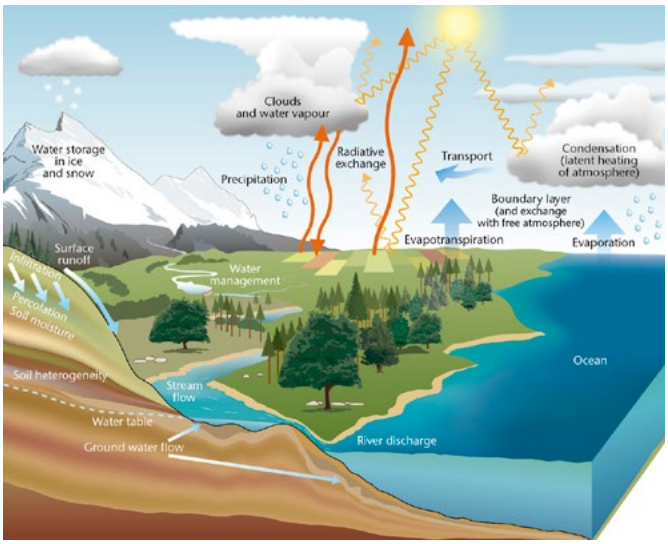
Depending on class knowledge, below are some resources for you to review the basics of watersheds and the water cycle.

What is a watershed?

Like a big bathtub, a watershed is an area of land where all water within it eventually flows out to a common "drain", such as a river, lake, or ocean. The boundaries of a watershed are higher places, such as hills or mountains, and work like the sides of the tub. Rain, snow, groundwater, and even pollution that fall within watersheds eventually drains to the river, lake, or ocean.

Water and watersheds connect us. Think of your watershed like a neighborhood. What happens in your yard, and your neighbor's yard, in the streets, and in the parking lots of your city affects the health of your local watershed and the water supplies.

A changing climate affects the amount and quality of water within your watershed. What affects your local watershed also affects our global well because it's a big cycle.



Source: https://www.freedrinkingwater.com/resource-water-cycle-student-guide.htm

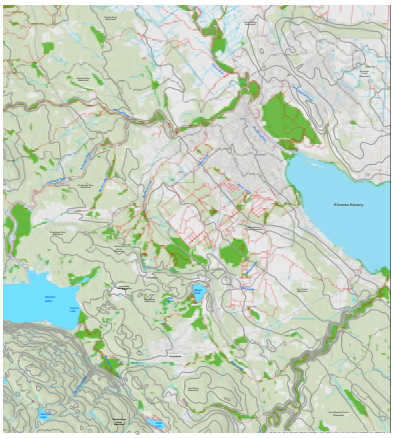
Interactive Water Cycle Diagram

Bill Nye 3 minute Water Cycle Video

Locating Ourselves in the Watershed

ACTIVITY:
WATER SAMPLE AND WATER STORIES

The goal of this activity is place-making – to build understanding and create connections between the Comox lake watershed and the sub watersheds of the Comox Valley, connect students with the lower subwatersheds (watershed in the urban areas) where they live, and to build knowledge about and appreciation for the interconnected nature of the Comox.



Materials:
- Tracing paper
- Coloured pencils
- Printouts of maps found in Appendix 2, one for each table group

Instructions:

1. One version of the map only illustrates waterways. The other version shows streets and municipal boundaries – don't reveal this version to students but have it available for reference. Cover the waterways-only map with the trace paper and tape down to each group's table.

2. Ask students the following series of questions as they look at the map:
- Where is Comox Lake?
- Where is your school?
- Where does drinking water come from
- Where does flooding happen?
- Where do you live?
- Where is Morrison Creek, Kus Kus Sum, Cumberland Forest, Goose Spit?
- Where can you find salmon?
- Where are the farms?
- Where are the sports fields?
- Where is your favourite park?
- Which way does the water flow?

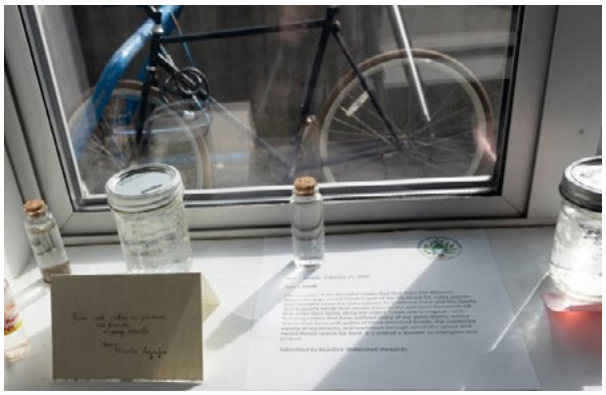
3. Encourage students to doodle, draw, colour, ask questions with their coloured pencils. They may also just colour boundaries, embellish creeks and streams and water bodies. The end goal is not a perfect map, it's a conversation, questions, answers.

4. When they've completed their maps, photograph them.

ACTIVITY:
WATER SAMPLE AND WATER STORIES

Materials:
- An area in the school or classroom to use as a repository
- Art-making and writing supplies
- Empty jars with paper and tape or stickers for labelling

Instructions:
1. Invite students to gather a sample from a water source/location that is important to them in a jar to place in a common gathering place in the classroom. Be sure to label with name, date and time of collection.
2. Prompt students to write a few words about the source and why it is important to them.
3. Invite students to write a poem, draw a sketch, make a painting, or other artwork to express their connection to the place and their memories, concerns or feelings about water.



*This activity was adopted from an exhibit activity presented at the Comox Valley Art Gallery

HANDOUT:
WHAT MAKES FIRE?
(adapted from **learningintheleaves.co.uk** and **https://kids.kiddle.co/**)

Understanding the Fire Triangle
The fire triangle is an easy way to remember what fire needs. It helps firefighters understand how to put out different kinds of fires. And helps us know how we can be responsible citizens. By removing just one part of the triangle, the fire can't continue to burn.

The fire triangle is a simple way of understanding the elements of fire. The sides of the triangle represent the three ingredients needed for fire: heat, fuel and oxygen

HEAT
Fire needs enough heat to start. It also needs heat to keep burning. If a fire gets too cool, it will simply go out.

How to Remove Heat
One common way to remove heat is by using **water**. Water cools down the burning material. This works well for fires involving wood or paper. However, water can be dangerous on other types of fires, like electrical fires.

Another way to reduce heat is to separate burning materials. For example, in a **forest** fire, firefighters might create a firebreak. They remove trees and plants in the path of the fire. This stops the fire from spreading to new fuel. It also helps to cool down the existing fire.

FUEL
Fuel is what fire eats! It is anything that can burn. This could be wood, paper, cloth, gasoline, or even gases. Without fuel, a fire has nothing to consume.With the climate changing to include longer, dryer summers, we now have a lot of very dry fuel on the ground throughout our community.

How to Remove Fuel
Removing the fuel means taking away what the fire is burning. This can be tricky, especially with large fires.

One method is to let the fire burn out the available fuel. This is sometimes done in controlled burns. Another way is to physically remove the fuel. For instance, if a fire is burning in a field, you might clear a strip of grass. This creates a barrier without fuel.

OXYGEN
Fire needs oxygen to burn. Oxygen is a gas found in the air all around us. Without enough oxygen, a fire cannot start or continue.

How to Remove Oxygen
Removing oxygen from a fire is called "smothering" it. This means covering the fire so air can't reach it. Some special foams are used for this. They spread over the fire and block the oxygen.

ACTIVITY:
GAME SHOW - SAFE/UNSAFE

Promote awareness about wildfire safety by categorizing activities as "Safe" or "Unsafe" for the Comox Lake Watershed.

Materials:
- 'What Makes a Fire?' Handout (for gr 4-9 students only)
- Safe/Unsafe questions
- 'Safe' and 'Unsafe' cards for voting

Instructions:
Start with a discussion about wildfires. Ask students if they know what a wildfire is and why they are important to be aware of. Briefly explain the risk wildfires pose to our drinking water, humans, nature, homes, and animals. Review the handout about how fire works, and discuss the risky behaviors mentioned in the introduction.

Divide players into teams or play as individuals.

Read each statement below aloud.

Players must decide if the activity is "SAFE" or "UNSAFE."

Award points for correct answers.

Discuss each statement briefly to reinforce learning.

Water Prtoection

Statements:

- Using designated fire pits for campfires
  Answer: SAFE
  (Using fire pits helps contain fires and prevents wildfires. There is only ONE designated public place for fires in campfire rings in the Comox Lake Watershed, and that is Lake Park Campground).
- Leaving a campfire unattended
  Answer: UNSAFE
  (Unattended campfires can easily spread and become wildfires.)
- Smoking in areas without proper disposal bins
  Answer: UNSAFE
  (Discarding cigarette butts can ignite flammable materials.)
- Attending a professionally organized public fireworks show
  Answer: SAFE
  (Professional shows are organized to manage fire risks.)
- Lighting fireworks at a beach or campsite
  Answer: UNSAFE
  (Uncontrolled fireworks can cause wildfires, especially in dry areas.)
- Having a campfire next to the water when there is a fire ban in place
  Answer: UNSAFE
  (Fire bans means no fires permitted anywhere https://www.comoxvalleyrd.ca/fire.)
- Using a dirtbike or quad on dry ground
  Answer: UNSAFE
  (Sparks from equipment can ignite dry vegetation.)
- Clearing dry leaves and debris from the forest floor
  Answer: SAFE
  (This reduces fuel for potential wildfires.)
- Burning leaves and yard waste on windy days
  Answer: UNSAFE
  (Wind can cause burning debris to spread uncontrollably.)
- Putting out campfires completely before leaving
  Answer: SAFE
  (Fully extinguished campfires prevent them from reigniting.)
- Starting a fire with flammable materials in a dry area
  Answer: UNSAFE
  (Flammable materials can quickly cause wildfires.)
- Enjoying a nature hike on established trails
  Answer: SAFE
  (Sticking to trails minimizes the risk of accidentally igniting a fire.)
- Cooking food on a portable grill
  Answer: SAFE
  (Using grills responsibly and keeping flammable materials away reduces risks.)
- Parking your car on a gravel surface
  Answer: SAFE
  (Gravel reduces the risk of sparking from hot exhaust systems compared to dry grass.)

Cards to print for participants to hold up and vote with.

SAFE

UNSAFE

Further Inquiry

ACTIVITY:
WATER AS A METAPHOR

This lesson could stand alone as an introduction meant to connect us to the feeling of water, or be the launch to a larger poetry and art project.

Often "water" is the metaphor for something else: life, cleansing, birth, rebirth, etc. Water is sometimes called "the elixir of life." Metaphors are concrete, simple, already understood words and ideas to explain something abstract, complicated and difficult to explain. Since water is already concrete and well known, we can use its qualities to describe other things.

Instructions:

1. Read **Fog**, by Carl Sandburg, and as a group, individually or in pars, answer the questions.

- What is he comparing the fog to?
- List the words in the poem that make you think of this animal.
- What do fog and this animal have in common?
- How are they alike?

2. Have the class work in pairs to generate sentences in which elements of water are used to describe something else.

3. Have pairs share back with the larger group.

Fog
The fog comes
on little cat feet.

It sits looking
over harbor and city
on silent haunches
and then moves on.

Examples:

I was really in the flow during that soccer game.

- What are the qualities of water flowing that would apply to a game of soccer.

When it rains, it pours.

- What is the author saying? What are the qualities of rain pouring down that might help the author describe what they mean?

What are some possible elements of water? (wet, choppy, blue, etc)

Further Inquiry

ACTIVITY:
PLAYFUL ELEMENTS OF WATER

These are playful resources to be shared that offer a completely different perspective on elements of water.

Share with the class for inspiration and examples, or as possibilities for further independent inquiry projects.

Music on Ice

BAIKAL ICE live sound - video from IRKUTSK ethnik percussion group playing on the frozen water of deepest and oldest Lake Baikal.

www.youtube.com/watch?v=en0p1Y35p3w

Skating on Thin Ice

This small lake outside Stockholm, Sweden, emits otherworldly sounds as Mårten Ajne skates over its precariously thin, black ice. “Wild ice skating,” or “Nordic skating,” is both an art and a science. A skater seeks out the thinnest, most pristine black ice possible—both for its smoothness, and for its high-pitched, laser-like sounds.

www.youtube.com/watch?v=v3O9vNi-dkA

Making Music with Water - Two Ways

Dave Maiullo, a Physics Support Specialist at Rutgers University, makes musical instruments using just wine glasses and some water.

www.youtube.com/watch?v=VmgZJ3F0jm8

How to Play the Glass Harp - this could make a science/art activity for the class to try.

www.youtube.com/watch?v=ezousM5zA0A

Further Inquiry

ACTIVITY:
HISTORY OF THE COMOX LAKE WATERSHED

The history of the watershed helps us to understand how and why the lake is what it is today. This knowledge supports learning both in connecting further to this ecosystem, and in being able to envision its future.

Materials:
- Copy of the timeline list below, cut apart into separate strips without the dates
- Tape

Instructions:
1. Cut the timeline dates and images on the following page into separate pieces of paper, removing the dates
2. Pair students up and distribute dates to them.
3. Invite students to place the timeline items onto the wall in chronological order, taping them in place to reconstruct the timeline. This will take time and involve negotiation and discussion amongst partner groups.
4. When the class is satisfied that the timeline is complete, have everyone step back and look at the whole line. Cross reference resources for accuracy. Rearrange as necessary.
5. Label each event with it's date.

Observing and Supporting Learning
Prompting Questions for Inquiry:
- Is there something you did not know about the lake?
- How does one item on the timeline affect the next?
- What might our vision be for what happens next in this timeline?

HISTORY OF THE COMOX LAKE

90 - 65 million years ago - The bedrock beneath most of the Comox Valley is sedimentary rock laid down on the floor of warm, shallow seas or swampy lagoons while dinosaurs roamed the land in the late Cretaceous Period.

80 million years ago - We'd be under a shallow sea of giant Elasmosaurus

15,000 years ago - All of BC, including Vancouver Island and the Strait of Georgia, was covered by ice sheets up to 2 km thick.

4000 years ago - Evidence of Indigenous Peoples' settlements.

1850's - Mineral prospectors explore vancouver island seeking opportunity

1852 - J.W McKay identifies coal seams in the Comox Valley with help from Indigenous guides

Further Inquiry

1870's - E&N Land Grant, 750,000 acres transferred to Robert Dunsmuir for building railway

1880's - Logging begins in the Comox Lake Watershed

1900–1912 - Construction of cabins at Comox Lake, trout fishing popular

1911 - Designation of Strathcona Park

1912 - First dam constructed for power for the local mines

1912–1914 During a coal mining strike, many displaced families built a temporary shantytown along the lake's shore

Families living along Comox Lake

1918 Ginger Goodwin, an English coal miner, was a steadfast champion of unionized labour and caused an uproar in the community when he dodged the draft in 1918. Ginger hid out in the mountains around Comox Lake and was secretly brought food and supplies by his supporters. Albert "Ginger" Goodwin was eventually found, shot and killed at the furthest end of Comox Lake in July of that summer.

1927 - Explosion in #4 Mine

1940's - First logging road was punched through to upper lake

1946 - Though unseen, the floor of the lake was completely shuffled due to an earthquake on June 23, 1946.

1959 - Kin Park project at Comox Lake begun by kinsmen, Council gave $200 to help with picnic tables

1960 - Damned and flooded a second time

1960 - Became a source of drinking water for the Comox Valley

1972 - Campsite developed at Lake Park, nature trails developed to Devils Ladder and waterfall.

1987 - Job Trac Program further develops the trails and facilities at Lake Park

Further Inquiry

The Collective Magazines Watershed, Comox Lake Related Articles:

History of the E&N Land Transfer
Loss Of The Commons

Logging History at Comox Lake
Deep Blue

Aquifers and groundwater in the Comox Valley
Wait Til The Sun Shines Nellie

History of Strathcona Provincial Park
Strathcona Park

Estuary, Lower Watershed Kus Kus Sum
Field Of Dreams

Eco Assets
Forest Faucet Life Era Humans

Wilderness Education at Comox Lake
Lost In The Wilderness

Intro to the Comox Lake Watershed/Watershed Issues
Shared Source

Salmon, Stewardship, K'ómoks Guardians and the Perseverance Watershed
Salmon And Stewardship

Snow Rain Dynamic and Climate Change in the Comox Lake Watershed
When It Rains It Pours

Further Inquiry

ACTIVITY:
GRAPHING LOCAL WATER DATA

In this activity have students graph water data to compare precipitation and water usage over the course of a year. When seen on a graph, this demonstrates the mismatch which occurs – that most water usage in the Comox Valley happens when there is low precipitation.

Materials:
- Graphing paper or ability to create graphs on computer
- Pencils
- Coloured pencils
- Chalkboard or whiteboard for recording and brainstorming
- Internet access for students to access data

Data Sources:
School based weather station network across BC managed by University of Victoria.

The following links directly to Cumberland Community School weekly rainfall amounts.
www.islandweather.ca/weeklyrain.php/?id=191

Government of Canada:
Historical precipitation numbers are available through Government of Canada website link:
www.climate.weather.gc.ca/historical_data/search_historic_data_e.html

General weather data from the Government of Canada.
www.weather.gc.ca/mainmenu/weather_menu_e.html

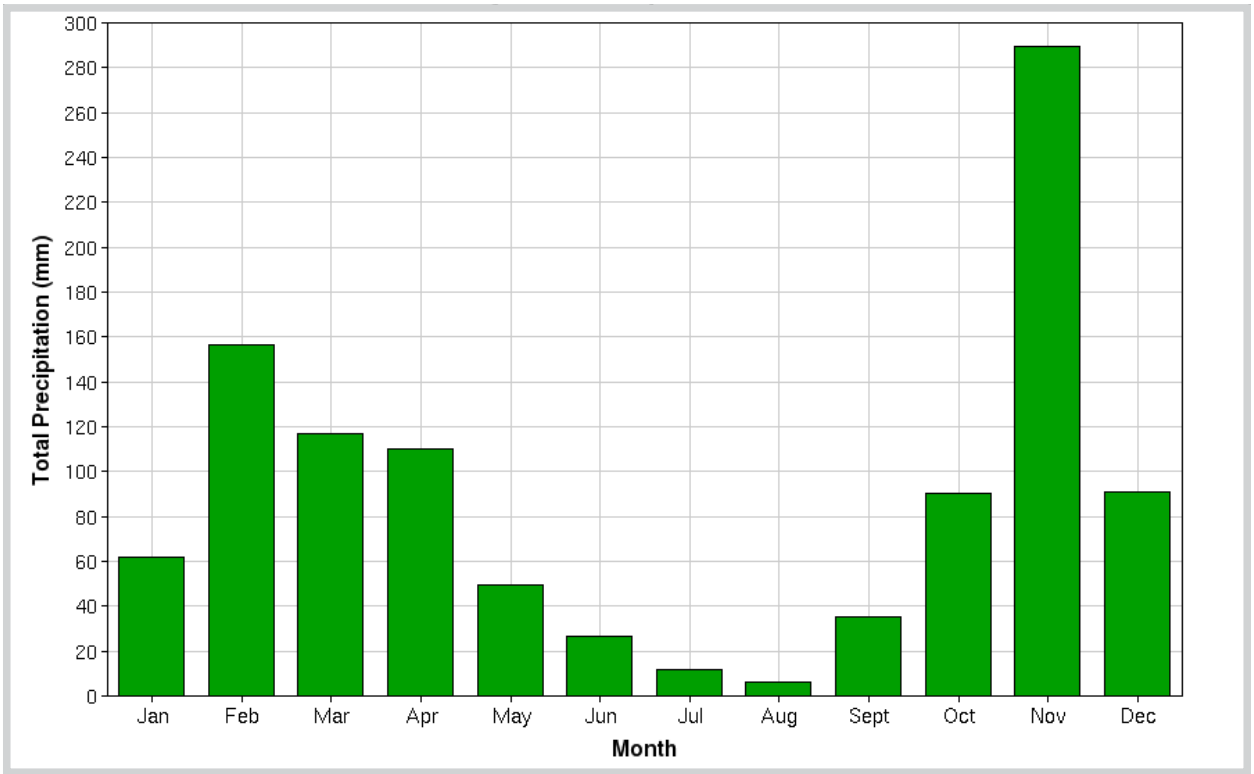
Water Quality Report, Comox Valley Water System
Comox Valley Water consumption is available in reports provided on the following page. Choose the most recent report to find the most relevant consumption data.
www.comoxvalleyrd.ca/waterquality

Further Inquiry

Instructions: Step One – Precipitation Graph

Have students create a bar graph of annual precipitation (like the example below), tracking it month by month. Use the following web site:

- Cumberland Community School weather station, School-based weather station network, University of British Columbia **www.islandweather.ca/station.php?id=191**



Credit: Cumberland Community School weather station, School Based Weather Station Network, University of Victoria

Observing and Supporting Learning

Prompting Questions for Inquiry:

- How much water do we have?
- Do we have enough water for the things we need it for?
- What part of this are we responsible for?

Further Inquiry

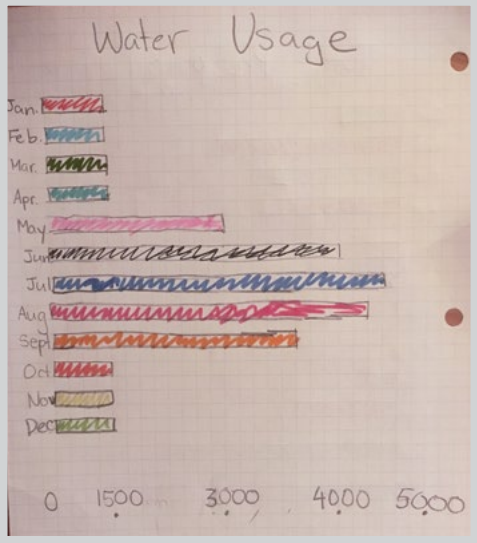
Instructions: Step Two – Water Consumption graph
Have students create a second bar graph, tracking water consumption data month by month.

Water usage data for 2017, Comox Lake Watershed

Month	Approximate Average Water Usage In Cubic Metres
January	523,500
February	523,500
March	523,500
April	523,500
May	1,022,000
June	1,022,000
July	1, 275,000
August	1,022,000
September	1,022,000
October	523,500
November	523,500
December	523,500

Credit: 2017 Water Quality Report, Comox Valley Water System, Comox Valley Regional District

Example of a completed graph by Grade 6/7 student.



Credit: Grade 6/7 Mrs. Collins' class at the Cumberland Community School, Cumberland, BC

Further Inquiry

Observing and Supporting Learning
Prompting Questions for Inquiry:
Once both of the graphs are complete, encourage conversation about water availability and water consumption.

- How much water do we have?
- Do we have enough water for the things we need it for?
- What part of this are we responsible for?
- When do we use the most water?
- What do you notice about how the precipitation and consumption are related to each other?
- What are some things that we can do in our own lives to bridge this 'mismatch'?
- What are some things that could be done with water management to bridge this 'mismatch'?

For digging for deeply into issues around water conservation, check out
5 Eye-Opening Conservation Activities Your Students Will Love.

Thinking Globally

ACTIVITY:
AROUND THE WORLD AND BACK AGAIN

This open-ended activity is meant to introduce students to larger water issues and compare to their own water usage. It can lead to many different conversations on income, human rights, geography, increasing populations, or can simply be kept for comparison of usage based on privilege and environment, as well as a conversation about water conservation.

Below are links to data resources to build awareness of many issues surrounding water globally, including an individual water footprint calculator.

Water Use and Stress: **Our World in Data - water usage** around the world - an excellent resource for many conversation.

Water Infographics: Some excellent **infographics about water**.

Annual water consumption per capita: Use for **basic comparison by country averages**.

Personal water footprint calculator: Includes a **quick and simple version and a more detailed version**, depending on how in depth you would like the conversation to be:

Waterwise tips for Water conservation: Create an opportunity for students to **make a pledge or commitment to lifestyle changes that they can apply immediately to conserve water**.

Observing and Supporting Learning
Prompting Questions for Inquiry:

- What do you notice about how water usage varies throughout the world?
- What do you think are some of the reasons for this?
- What did you learn about your own water consumption?
- How does it compare to other countries?
- Were there other issues about water that you learned about?
- What are some changes you could make to your own water consumption?

ACTIVITY:
A LONG WALK TO WATER, LINDA SUE PARK, A NOVEL STUDY

Sharing this book together is an excellent way to personalize the conversation around global water issues and generate meaningful conversations about access to water. A class set of this book is available through the SD71 High School library system.

A Long Walk to Water is based on the true story of Salva, one of some 3,800 Sudanese "Lost Boys" airlifted to the United States beginning in the mid 1990s. Before leaving Africa, Salva's life is one of harrowing tragedy. Separated from his family by war and forced to travel on foot through hundreds of miles of hostile territory, he survives starvation, animal attacks, and disease and ultimately leads a group of about 150 boys to safety in Kenya. Relocated to upstate New York, Salva learns English and continues on to college. Eventually he returns to his home region in southern Sudan to establish a foundation that installs deep-water wells in remote villages in need of clean water. This story of Salva's life is told side- by-side with the story of Nya, a young girl who lives today in one of those villages.

Book Trailer

Materials:
- Class set of A Long Walk to Water, written by Linda Sue Park (for School district 71 teachers, this is available through your high school library as a part of the Connected by Water kit)
- OR, one copy of the book to be read aloud to class
- Below are links to audio versions of the book

A Long Walk to Water Chapter One Read Aloud

Audiobook – A Long Walk to Water – available on Hoopla for free.

Lost Boys of the Sudan.

I Kept Walking, Salva But.

Observing and Supporting Learning
Prompting Questions for Inquiry:

Below are examples of sentence starters and questions to facilitate discussions with your students as a class, in partners or small groups:

- I think the hardest part about walking all day to get water would be... because...
- How is your life different from Salva's?
- How would you feel if you had a journey like Nya's every day?
- How does water dictate Nya's life? What most dictates your life?
- My favorite part of the book was... because...
- Water is central to this story. Do you think that water has the power to bring people together or drive them apart?
- I was sad/upset when... because...
- I was surprised when... because...
- My favorite character was... because...
- If I had less access to clean water the hardest thing to give up would be... because...
- This book made me want to learn more about... because...

Additional Resource:

Below is a resource link to a curriculum guide for A Long Walk to Water written for 'Global Read Aloud, 2017' for teachers who would like to pursue a more in depth unit about this book. It includes interviews with the author, extended information about the Sudanese War, vocabulary and literary terms.

A Long Walk to Water - Cross Curricular Learning Guide

ACTIVITY:
THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

On 25th September 2015, leaders from 193 member states of the United Nations, met to discuss the world's problems and decide on a plan to tackle them. They named this plan the 17 Sustainable Development Goals (SDGs). The three big aims of the goals are that we fight inequality and injustice, end extreme poverty, and tackle climate change. The Global Goals are the most ambitious agreement for sustainable development that world leaders have ever made.

Introducing students to these goals helps them to understand larger international issues, as well as introducing them to what people all over the globe are doing to improve the lives of everyone. Access to clean drinking water is a part of the SDGs.

There are many resources available for teaching the SDG's to students available here:
worldslargestlesson.globalgoals.org/

Thinking Globally

For an excellent lesson specific to water, including international maps and images, see the following link:

Goal #6 - Clean Water and Sanitation
Clean Water for All Activity

Observing and Supporting Learning
Prompting Questions for Inquiry:

- What are some things to consider about where we live with regard to water?
- How equal is access to clean water around the world? Is it the same for everyone?
- Which of the causes of water pollution mentioned in the lesson could affect our local water supply?
- What are some things we can attend to in our community to ensure a continued supply of clean drinking water?

ACTIVITY:
CARTOONING ABOUT CLIMATE DENIAL - INOCULATION THEORY

Teaching about climate change can seem daunting, especially with conflicting information circulating in abundance. Climate change has the potential to have a significant impact on our drinking water (see below for additional info on how climate change affects water). A part of our role as educators is to arm students with the ability to interpret the news and critique it for accuracy. Using "Inoculation theory." we can help students anticipate arguments that are based on deliberate attempts to misinform them about climate change, thereby "inoculating" them against those misinformation attempts. Research has shown this to be an effective way of protecting the public from politically motivated misinformation campaigns. More detail on this can be found here:

Green Teacher Resource Bank

Students will be invited to explore myth vs. fact regarding climate change in an effort to equip them to critically analyze the news and become accurately informed.

Materials:
- Projector with internet access
- Appendix 3 large cartoon examples for sharing via projector
- Paper and drawing/colouring utensils

Instructions:
1. On a projector, call up the Fake News Game and play as a class **www.getbadnews.com/#intro**
2. Ask the class if they know what is fact and what is myth when it comes to climate change.
3. Introduce some myths about climate change provided here:

MYTH #1

The Earth's Climate has always changed, so it's no big deal

Over the course of the Earth's 4.5-billion-year history, the climate has changed a lot. This is true. But the rapid warming we're seeing now can't be explained by natural cycles of warming and cooling. The kind of changes that would normally happen over hundreds of thousands of years are happening in decades. Global temperatures are now at their highest since records began. In fact, 17 of the 18 warmest years on record have all taken place since 2001.

MYTH #2

Global warming it not real as it's still cold

Global warming is causing the Earth's average surface temperature to increase. This is not only making heatwaves and droughts more likely, but it's also causing changes to our natural climate systems. These changes are making extreme weather events more likely and more severe. For example, hurricanes and storms are becoming more intense, moving more slowly, and taking longer to die down.

More myths available here:
10 Myths About Climate Change

4. Show cartoons in Appendix 2.

5. Invite students to create a cartoon based on other myths that they have heard about climate change.

6. Have them present to class with facts that offset the myth.

Observing and Supporting Learning
Prompting Questions for Inquiry:

- Is it difficult to find accurate information?
- What would the reason be for distributing inaccurate information?
- Was there something presented here that changes your mind?
- How can you be sure to get accurate information about climate change?

For further interactive practice with the Inoculation Theory, students can play a political misinformation game called **Harmony Square** here.

Additional Information:

Below are some details about how climate change is affecting our water.

Rising Air and Water Temperatures: Air temperature has a direct effect on increasing water temperature and evaporation of water from lakes and rivers. Hotter days also mean less soil moisture, more evaporation, and less groundwater recharge to replenish water levels in streams and lakes. This can affect municipal drinking water supplies. Lower water levels will affect navigation which impacts shipping, recreation, and public safety. Warmer water temperatures can favour invasive species that can outcompete native species. Warmer water temperatures are favourable to toxic organisms like blue-green algae.

Increase in Intense Rain and Storm Events: A warmer " juiced up" atmosphere can hold more water vapour and intensify rainfall events. Intense storms cause flooding that can damage private property and public infrastructure, and affect buildings, electrical systems, roads, bridges, and municipal water systems. These are costly repairs. Flooding and erosion from intense storms can destroy fish and wildlife habitat. Intense heavy rainfall events can wash away fish nesting areas and fish eggs, or cover them with sediment and silt.

Drought: While the intensity of rainstorms is projected to increase, so is the frequency of localized periods of extreme drought caused by an increase of days over 30 degrees C. Stream flow and lake levels may be lowered. Important aquatic habitats and vegetation within the shallower water that provide spawning, feeding, and resting areas could be reduced or eliminated.

Changing Precipitation: Even through climate change models project that there will be more rainfall overall (especially as rain falls during winter months instead of snow due to warmer temperatures), the forecast is that there will not be enough precipitation to balance the higher rate of evaporation due to higher summer temperatures. Summer lake and stream levels are predicted to be lower. This will impact the amount and quality of aquatic habitats available for fish.

Shorter, Warmer Winters: Shorter winters result in more evaporation and water loss from rivers and lakes. Ice on a lake blocks the evaporation of water from its surface. The lack of ice allows evaporation from lakes even during the winter, resulting in lower lake levels.

Melting Glacial Ice: Warmer temperatures will affect water that has been locked in long term storage as glacial ice. Melting glacial ice releases water into Earth's systems, raising sea levels. We have a glacier in our own back yard that we can see shrinking. These melts are responsible for sea levels are rising due to climate change. This is already causing flooding in coastal areas.

Rising Sea Levels: Water becomes less dense and expands when it is warmed. As global temperatures go up, oceans will get warmer and their waters will expand. This is called “thermal expansion”. Together with the additional water from melting glaciers, thermal expansion of the ocean will contribute to sea level rise. This will threaten coastal communities and productive near-shore coastal habitats..

Ocean Acidification: Oceans absorb about a quarter of the CO_2 emitted each year. The CO_2 reacts with seawater to form carbolic acid. The ocean is now 30% more acidic due to the amount of CO_2 that has been absorbed. More acidic seawater prevents marine animals, like corals and oysters, from building the shells they need to survive.

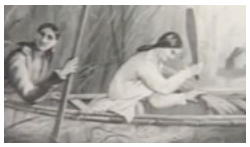
**Excerpt adopted from GWOW - Hear The Water Speak*
g-wow.org/en-us/hear_water/default.aspx

ACTIVITY:
REVIEWING STUDENT-MADE CLIMATE CRISIS FILMS

This activity can be used simply as a film review, or as a launching-off point to invite students to create their own films. These can be either shared within their inner circle, or submitted to film festivals and contests. This can be as big or small as you would like!

Materials:
- Students will need access to the internet
- Technology for filming, editing and presenting films should you wish to pursue this direction

Instructions:
1. Watch the following youth-made videos



A film made by youth about water and climate change:

GWOW - Hear The Water Speak > Connect Culture
g-wow.org/en-us/hear_water/connect/default.aspx

2. Introduce students to the Kimberly Foundation Student film library
kimberley-foundation.org/student-film-library-master/

3. In groups, pairs or individually, invite students to choose a film to watch, summarize, discuss and present to the whole group

4. Take the exploration further by having students create their own films. Final pieces can be submitted to the following organizations:

FOCUS! Climate Change Video contest:
kimberley-foundation.org/focus-main-page/

Reel Youth Film Festival
www.reelyouth.ca/RYFF.html

Taking Action

ACTIVITY:
YOUTH VOICES AROUND THE WORLD, RESEARCHING YOUTH ACTIVISTS

In this activity, students have the opportunity to research and highlight young activists working in various fields throughout the world. Youth will see that age does not necessarily impede one's desire to make a difference, and also discuss how not all youth need to be leaders and even small actions, or supporting others who are leading, can make a difference.

Materials:
- Students will need access to the internet

Instructions:
1. Invite students in pairs, groups, or individually to research one of the youth activists highlighted below.
2. Have them create a representation of learning - art piece, PowerPoint, poster, song, essay, etc - to share back with the larger group in order to introduce the activist and their work to the class.

   Alternatively, have learners find other activists not on the list to highlight.

Photo of Zero Hour activists,**https://www.thisiszerohour.org/whoweare**

Observing and Supporting Learning
Prompting Questions for Inquiry:
- Do these activists have anything in common with each other? With you?
- What kind of a difference have they been able to make?
- Were there any obstacles for them?
- What are some of the ways they draw people's attention to things that they care about?
- Are there people already leading in an area that you care about that you could offer support to?
- What are other ways to take action on something you believe in?
- Are there smaller actions that you can take in your own life around issues that you care about?

YOUTH ACTIVISTS:

Autumn Peltier is a 15-year-old Canadian Water Activist. Autumn is an advocate for clean drinking water in First Nations communities.
en.wikipedia.org/wiki/Autumn_Peltier

Autumn Peltier, 13-year-old water advocate, addresses UN:
www.youtube.com/watch?v=zg60sr38oic

Elsa Mengistu is the former director of operations and logistics and currently is an operations coordinator at Zero Hour, a grassroots climate organization intent on gaining support for the Youth Climate Movement.
https://climateleadershipconference.org/speakers/elsa-mengistu/

Isra Hirsi is an American environmental activist who co-founded and serves as the co-executive director of the U.S. Youth Climate Strike.
en.wikipedia.org/wiki/Isra_Hirsi

Jamie Margolin is a Colombian-American climate justice activist and the co-executive director of Zero Hour, a climate action organization based in Seattle, Washington. She has written for various media outlets, such as CNN and Huffington Post.
en.wikipedia.org/wiki/Jamie_Margolin

Jasilyn Charger is a Land Defender and community organizer youth advocate for the Cheyenne River Sioux Tribe. She is 23 years old and has been on the frontlines for six years battling pipelines, protecting and advocating for Native American and LGBTQ rights.
www.earthguardians.org/speakers-bureau/jasilyn-charger

Kehkashan Basu is an environmental activist, speaker and youth leader. Winner of the 2016 International Children's Peace Prize, this 18-year-old youth leader has been impacting children's rights, promoting gender equality, mitigating climate change and social upliftment. She is the founder of a youth organization, GREEN HOPE FOUNDATION.
https://en.wikipedia.org/wiki/Kehkashan_Basu

Kevin J. Patel is a 19-year-old Youth Climate & Environmental Activist from Los Angeles, CA. He is the Co-Deputy Partnerships Director for the youth-led climate movement Zero Hour, and is a lead organizer for Youth Climate Strike LA. Kevin works with Climate Reality as a leader, and with Ignition Green as a chapter coordinator. Kevin is also Founder and Executive director of OneUpAction.
https://www.imkevinjpatel.com/

Taking Action

Mari Copeny, also known as 'Little Miss Flint', is an 12-year-old activist fighting for the children of Flint, Michigan. At only 8 years old, Mari and her siblings had to learn not to turn on the water in Flint, Michigan after news broke of a water crisis. Since 2016, Mari has fundraised over $500,000 that has impacted over 25,000 children in Flint and beyond.
www.maricopeny.com/about

Nadia Nazar is the co-executive director and art director of Zero Hour and is an old hand at active protests thanks to the organization's march last year. And all of this by the age of 17.

Meet Zero Hour's Nadia Nazar: Youth Taking On Climate Change:
https://nadianazar.com/about#:~:text=Nadia%20co%2Dfounded%20Zero%20Hour,work%20in%20the%20Climate%20Movement.

Xiuhtezcatl Martinez is an American environmental activist and hip hop artist. Martinez is the youth director of Earth Guardians, a worldwide conservation organization.
en.wikipedia.org/wiki/Xiuhtezcatl_Martinez

Xiye Bastida is a Mexican-Chilean climate activist and member of the indigenous Mexican Otomi-Toltec nation. She is one of the major organizers of Fridays for Future New York City and has been a leading voice for indigenous and immigrant visibility in climate activism. She is on the administration committee of the People's Climate Movement and a member of Sunrise Movement and Extinction Rebellion.
en.wikipedia.org/wiki/Xiye_Bastida

Zanagee Artis was just 16 when he co-founded Zero Hour. He has been recognized by national publications, including the New York Times. Most recently, he was recognized by Teen Vogue as one of the magazine's "9 Climate Activists of Color You Should Know."

Climate activist Artis '22 featured in Teen Vogue:
www.browndailyherald.com/2020/01/28/climate-activist-artis-22-featured-teen-vogue/

Zeena Abdulkarim is an organizer with Zero Hour who works with the advocacy and finance team. In addition to helping the climate justice cause, Zeena advocates for social justice for oppressed and minority communities and is an outspoken supporter of Black Lives Matter and Amnesty International.

Fashioning the Future With: Zeena Abdulkarim of Zero Hour — Style Engineers Worldwide:
www.styleengineersworldwide.com/style-engineers-blog/zeenaabdulkarim

Taking Action

ACTIVITY:
WHAT IS OUR LEGACY?

The purpose of this activity is to inspire and empower students to inquire into their values and reflect on how they live them. This personal reflection can help them move forward into participating in community change in a way that inspires them.

Materials:
- Values sheets (see Appendix 4)
- Projector with internet access to view videos

Instructions:
1. As a class, discuss what values are, i,e:
- Core beliefs
- Philosophies that we hold about life, its purpose
- Help us define who we are, how we want to live our lives, our purpose
- Help us assess whether we are 'on track' or not – defines whether we have a successful life Directs our priorities and choices

2. Discuss what and who influences our personal values as we grow up, i.e.:
- The personal values of people around us
- Our family
- Our peers
- Our culture
- Politicians
- Faith leaders
- Media – movies, TV, celebrities
- Artists – music, poetry, stories, paintings

3. View the videos below as a class, with time for reflection and discussion:

The Story of our Generation
https://www.youtube.com/watch?v=2zdvctRYaLg

What are Community Values?
www.youtube.com/watch?v=eKz2R61YUV0

4. Hand out Values Sheet and have students circle their top 10 - 15 values that are most important for them in their lives right now. From their top 10 - 15, ask students to choose their top 5.

Taking Action

5. In pairs or individually, have them brainstorm ways these values have impacted their decisions and how they may impact future decisions, as well as reflect on why these values may be important to them.

6. Have students choose one of the values and think of an activity that would reflect this value. This activity should be something that:

- They would enjoy
- Could be done within the week
- Is not too hard nor does it cost too much
  For example if your value is love, your action might be to do something loving for another, like spend some time with a grandparent, asking about their life and values; or going out to the park; or doing a good deed for someone - a family member or friend.

7. Create a mechanism for checking in the following week to report back how the activity went - presenting to class, sending you an email, writing about it on a class blog, etc.

Observing and Supporting Learning
Prompting Questions for Inquiry:
- Did you learn something new about yourself by doing this reflection?
- How will knowing these things about yourself affect your decision-making?

**This lesson was adopted from Be the Change Earth Alliance*
www.bethechangeearthalliance.org/teacher_resources

ACTIVITY:
ME, WE OR THEM?

This activity is based on a presentation made at the 2020 SD71 Youth Climate Action Day. Courtenay City Councillor Will Cole-Hamilton coached students on how to move an agenda forward - how to decide who to talk to and how to talk to them.

Materials:
- Appendix 5 to read aloud to class

Instructions:
1. Read Appendix 4 aloud to class.

2. In pairs, ask students to share an idea they have bout something they think should happen in the community.

3. Prompt students to decide if it is a ME, WE or THEY issue.

4. Have them work through Will's suggested process for who they might look to for support.

Photo of students meeting with Municipal leaders to ask them to declare a climate crisis

Arden Elementary students presenting to Council

Taking Action

ACTIVITY:
INVESTIGATING A LOCAL WATER ISSUE

This activity will introduce examples of communities taking action to protect their water sources, and then students will have the opportunity to discuss the issue as well as write a letter to the Editor.

Materials:
- Projector with internet access
- Computers or notebooks for students to work on their writing
- Recent local newspapers, enough to pass out to class for reading and sharing

Instructions:
1. Watch the videos below:

   The Story of Bottled Water (8:04)
   storyofstuff.org/movies/story-of-bottled-water/

   Our Water, our future (7:29)
   storyofstuff.org/movies/our-water-our-future/

   This Land is Our Land (4:20)
   storyofstuff.org/movies/nestle/

2. Encourage students to investigate any relevant local stories by searching the Internet and local newspapers for connections to local water issues.

3. Pass out newspapers to the class, and ask students to find the letters to the editor in their papers. Give students a few minutes to skim through the letters, and jot down characteristics that they see in the letters.

4. Invite students to select a topic that they care about to practice writing a letter to the Editor. View this video for a brief, concise explanation:

   How to Write a Letter to the Editor lesson plan:
   https://education.cfr.org/teach/activity/instructions-writing-letter-editor

5. Depending on time spent on this and how far your inquiry takes you, students could submit letters to the Editor to the local paper, the Comox Valley Record, or beyond.

Observing and Supporting Learning
Prompting Questions for Inquiry:
- Do you see similarities between our local water bottling issue and those in other communities?
- How does one decide between individual business interest and the interests of the collective?
- If you were to write a letter expressing your opinion about bottling water in our community, what might you say?

Taking Action

ACTIVITY:
SERVICE LEARNING

As our inquiry unit winds down, it's important to reflect back on our original driving question: "What allows me to have safe water that I can drink?" and to support students in connecting their learning out into their world. With this in mind, we suggest pursuing a service learning project in your community.

Service learning activities are ones that combine learning goals and community service in ways that can enhance both student growth and the common good. It is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach social responsibility, and strengthen communities.

It is: "a form of experiential education where learning occurs through a cycle of action and reflection as students... seek to achieve real objectives for the community and deeper understanding and skills for themselves. In the process, students link personal and social development with academic and cognitive development... experience enhances understanding; understanding leads to more effective action."

—Janet S. Eyler, Vanderbilt University (winner of the 2003 Thomas Ehrlich Faculty Award for Service Learning)

Service learning can create the following outcomes:

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Greater sense of personal efficacy, personal identity, and moral development
- Greater ability to work well with others, and build leadership and communication skills
- Improved social responsibility and citizenship skills
- Connections with community members for learning and future work and career opportunities

Below are opportunities for your class/students to connect more deeply with their relationship to water as it relates to larger community causes.

COMMUNITY SERVICE:

The Great Canadian Shoreline Cleanup
Small groups, individual classes or whole schools can sign up and coordinate a cleanup along the shore in our area.

www.shorelinecleanup.ca/

Taking Action

CITIZEN SCIENCE:

Earth Echo Water Challenge
Collect and share global water quality data while inspiring action to protect local waterways.

scistarter.org/earthecho-water-challenge

ISee Change
Connecting communities to investigate weather and climate change through environmental reporting that combines citizen science, citizen journalism, NASA satellite and weather data, sensors, and community curiosity to monitor changing of environmental conditions.

scistarter.org/iseechange?utm_source=scistarter.com&utm_medium=email&utm_campaign=welcome

World Water day!
Introduce students to what is being done to protect water all over the world. Create World Water day awareness in your school community

www.worldwaterday.org/

Appendix 1: The Legend of Queneesh

Queneesh is the K'ómoks name for the gleaming white glacier which can be seen from all over the Comox Valley. The Legend of Queneesh tells us how a great white whale saved the K'ómoks people. It began long ago when the K'ómoks people still lived in big cedar plank houses along the shores of Puntledge River estuary.

One night an elder of the village, Quoi qwa lak, had a powerful dream. It warned him of a coming time when the rain would fall for many days and nights. In his dream he was told that this rain would cause a great flood and the K'ómoks people would be in danger.

In order for them to survive the flood, they would have to make canoes, cedar bark rope and clothing and preserve food for the coming disaster. Gye gya janook, Chief of the K'ómoks, directed all of the people of the village to work together so that they would be ready when the rain began to fall.

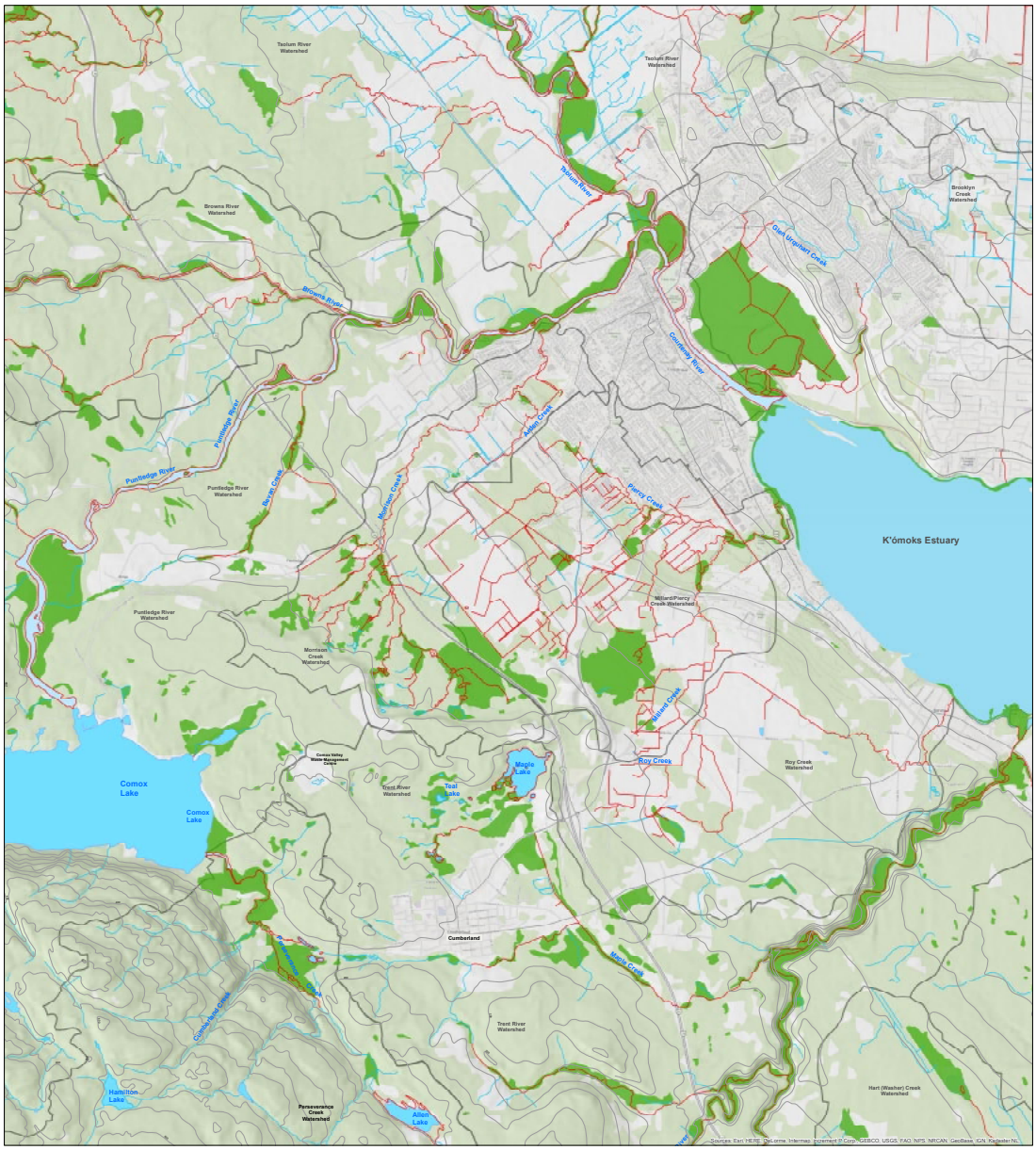
Quoi qwa lak himself supervised the making of a strong cedar bark rope that was many miles in length. The rope had to be long enough to reach from the village to the top of the glacier.

As foretold, the rains began to fall just as everything was ready. The river rose rapidly to flood stage. Young men carried the long cedar rope from the village to the mountains and attached it securely to the glacier. The people tied their loaded canoes to the rope so they wouldn't get swept away to sea by the flood waters.

Soon the land was covered with water and still it continued to rain. The people were afraid as the water continued to rise up to the glacier where they had anchored their canoes. Suddenly the glacier began to float, breaking up through the rising waters like a giant grey whale breaching. The people were awestruck as they watched the glacier become a huge white whale.

"Queneesh, Queneesh!" they called. Queneesh almost floated free of the mountain, but the rain stopped and the flood waters began to recede. The K'ómoks people were saved. Some are still heard to whisper to him "Kwo la whee gai, Queneesh". "Thank you, thank you."

Appendix 2: Lower Watershed Maps



Legend
- Watershed Boundaries
- Lakes

Watercourses
- Confirmed fish presence
- Unknown fish presence

Sensitive Wet Areas
- Riparian and Wetland

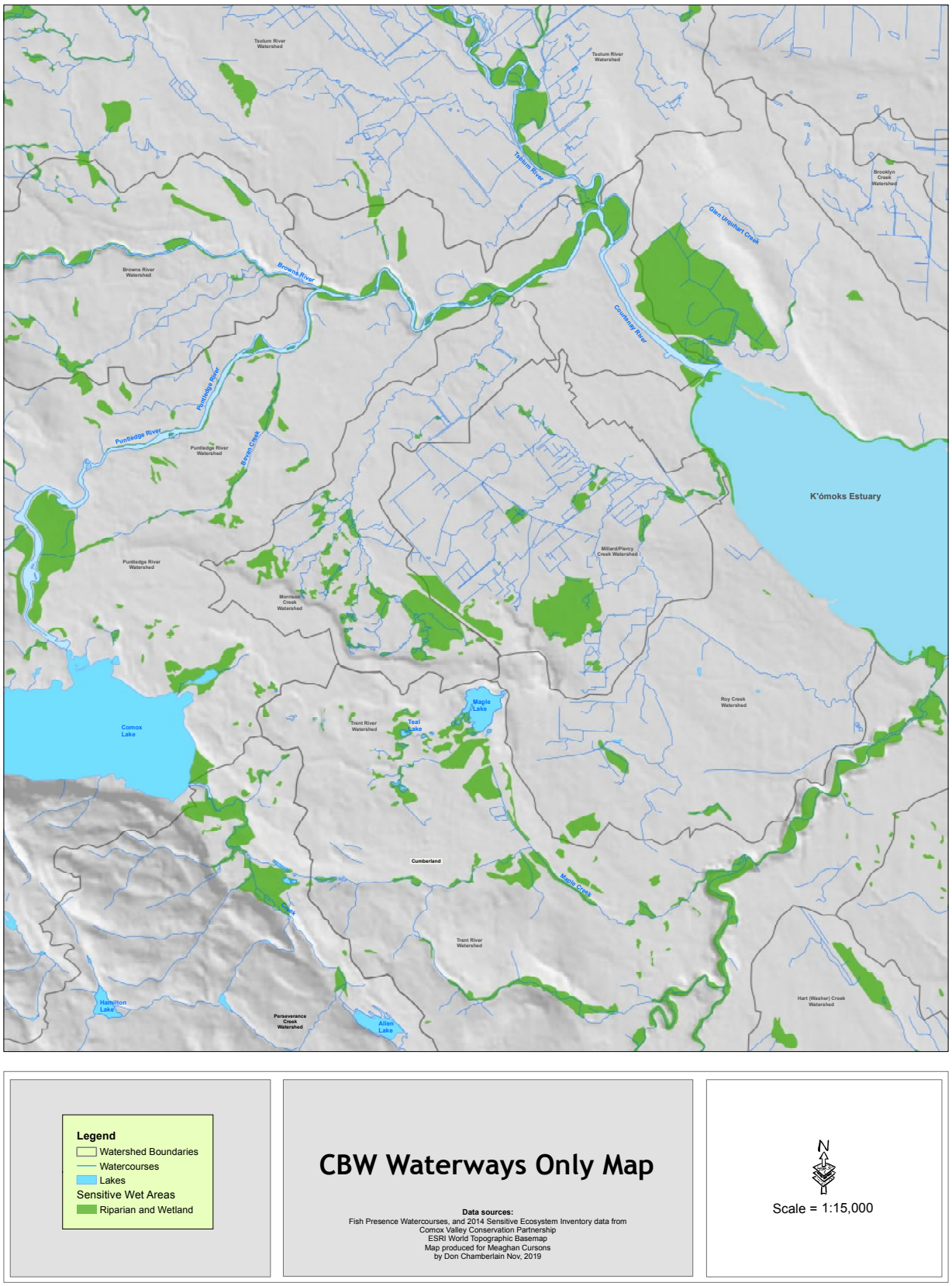
CBW Detailed Map

Data sources:
Fish Presence Watercourses, and 2014 Sensitive Ecosystem Inventory data from
Comox Valley Conservation Partnership
ESRI World Topographic Basemap
Map produced for Meaghan Cursons
by Don Chamberlain Nov, 2019

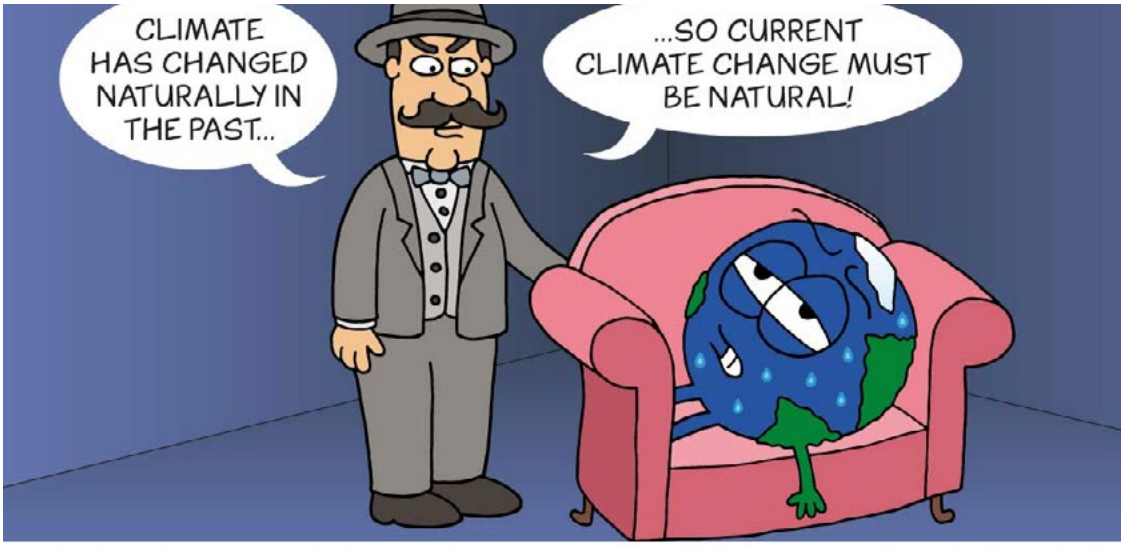
N

Scale = 1:15,000

Appendix 2: Lower Watershed Maps



Appendix 3: Cranky Uncle Climate Impact Denial Cartoons



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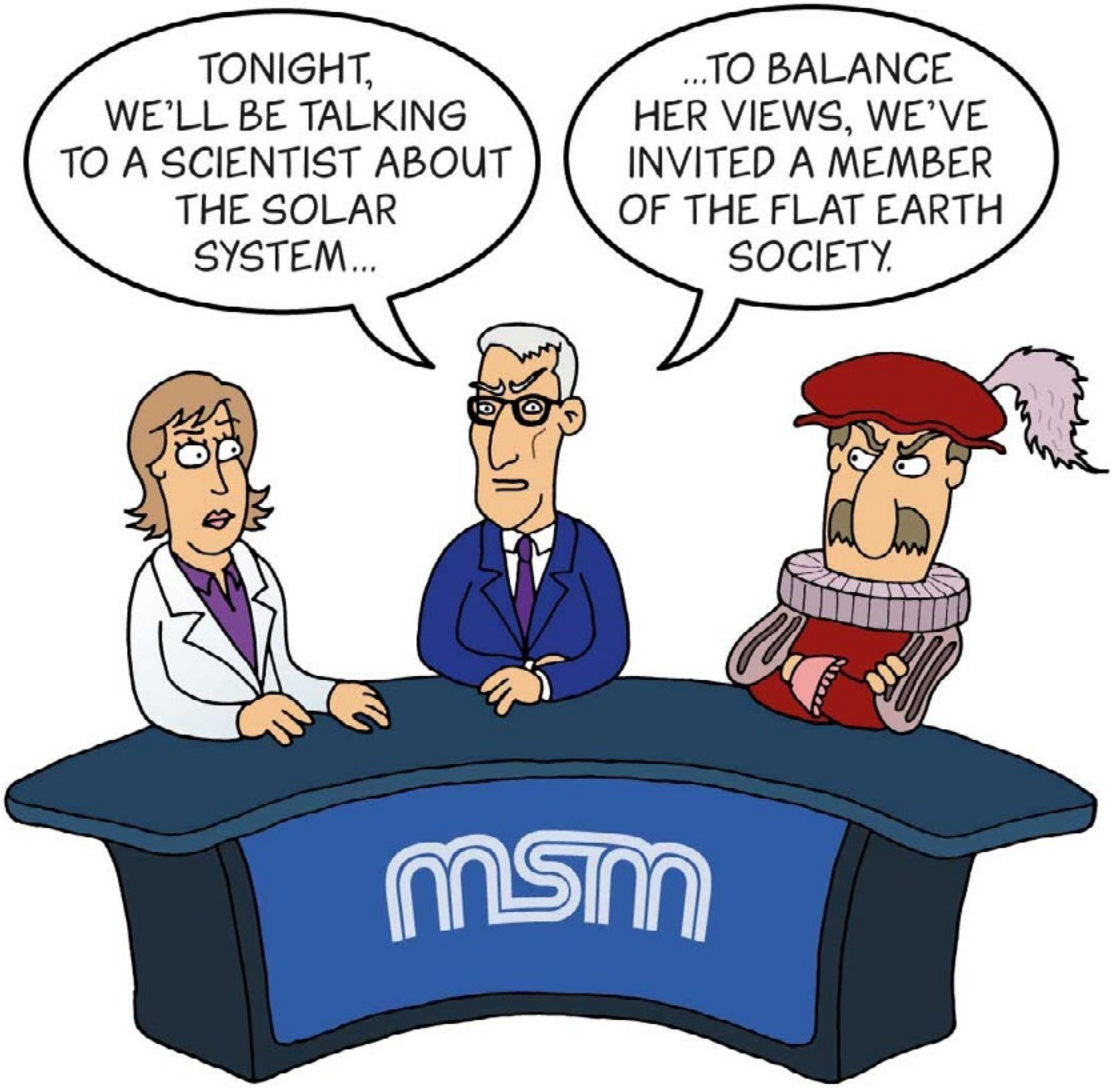

Appendix 4: Personal Values Sheet

Accomplishment
Accountability
Adventure
Beauty
Career
Challenge
Change
Charity
Cleanliness
Collaboration
Commitment
Communication
Community
Competition
Connection
Cooperation
Creativity
Decisiveness
Democracy
Determination
Discipline
Discovery
Diversity
Ethics
Equality
Excellence
Exploration
Faith
Fame
Family
Freedom
Friendship
Fun
Generosity
Goodwill
Gratitude
Happiness
Hard Work
Harmony
Health
Honesty
Honour
Independence
Individuality
Innovation
Integrity
Intelligence
Justice
Kindness
Knowledge
Leadership
Love
Loyalty
Meaning
Money
Nature
Openness
Order
Peace
Perfection
Personal Growth
Perseverance
Pleasure
Power
Practicality
Privacy
Progress
Prosperity
Public Service
Punctuality
Purity
Recognition
Reliability
Relationship
Reputation
Resourcefulness
Respect
Responsibility
Security
Self-reliance
Self-respect
Sensitivity
Serenity
Service
Simplicity
Solitude
Sophistication
Spirituality
Spontaneity
Status
Strength
Success
Teamwork
Tolerance
Tradition
Trust
Truth
Unity
Wealth
Well-being
Wisdom

*Adopted from Be the Change Earth Alliance **https://www.bethechangeearthalliance.org**

Appendix 5: ME, WE or THEM?

Below are condensed notes from local Comox Valley politician Will Cole-Hamilton's presentation at the 2020 Comox Valley Youth Climate Action Forum

How can I have an impact? - First, I need to know who needs to give the greenlight for the change I want to see - is it **ME, WE or THEM**?

For example – if you want to work on food security, you might want to get your hands dirty and volunteer at a local community garden – that is a **ME** decision - your decision to volunteer is what you need - so that is direct impact.

Let's say that you have been volunteering at the garden for a few months, and you had a presentation at school about waste – and you can't compost at home (maybe you live in an apartment building) – so you'd like to bring your family's compost to the garden and add it to the theirs. You go to the monthly meeting at the garden and suggest that the garden makes a new rule that allows members to bring compost. That is a **WE** decision, you are part of a group that makes the decision, and you want to change the way your group does things. Your group are the people who can give the green light. with **WE** decisions. You know the people making the decision, and you probably have a good idea of how to convince them - you know what matters to them.

Once you've made that decision you need to figure out who you need to convince – who needs to give the green light to bring your plan to action

So you are on a roll with composting now. Next maybe you want to convince your school to collect compost and donate it to the community garden. What you need to do is convince other people to make a decision – your first question to ask yourself is, who are these other people – if **THEY** need to give the green light, who are **THEY**? This is a question that mentors in your community can help you figure out.

So let's think about the question of who to talk to. If it's something that happens in your school then the answer will involve talking to school administration. But if it's outside school grounds, things get a bit complicated. We have six levels of government in Canada, and 'who does what' can get really complicated. For example, law students have to take this course – 5 hours a week for 4 months – just to get a basic idea – some professors study this for the rest of their lives. I'm not expecting to be able to explain it all in a couple of minutes here – but let me give you a quick description of what those 5 levels of government are:

Appendix 5: ME, WE or THEM?

1. First nations governments – if you live in a First Nation, then you will definitely be talking to First Nations government. Even if you don't, maybe talk to your resource teacher to see if there are ways to work together with your local First Nation in achieving your goal – reconciliation.

2. National government in Ottawa handles many areas including our coastlines and our salmon fisheries – Ottawa is far away but wherever you live, you have someone who represents you in Ottawa. They are called Members of Parliament, or MPs. they spend part of their time in Ottawa and part of their time back in your community. You can meet with them when they are spending time here. I've met most of them and they're nice folks – they'd be happy to meet with you.

3. BC has its own government in Victoria. They deal with forests, with lakes and rivers, with transit, with what gets taught in your schools (and many other things too). The people who represent you and your community in Victoria are called Members of the Legislative Assembly or MLA's. They spend some of their time in Victoria and some of it back in your community. These are the MLA's who represent you, and they'd also be happy to sit down and talk to you.

4. Regional Districts deal with things that are too big and complicated for cities and towns to do on their own. For example, we will soon have a compost facility that takes food scraps and yard waste from lots of places (Courtenay, Comox, etc) and composts it all in one place.

5. Local governments – like city or town councils – deal with providing clean water, building and fixing roads, deciding what kinds of buildings should go where, taking care of parks – and sticking with composting. Our City Council is in charge of picking up the compost from your house and then they take it to the compost centre that is run by the Regional District.

6. Finally there is the School Board level – if the thing that you want to do happens on school property then you will definitely be talking to your school board.

So it's complicated and there are lots of different governments involved. My advice is to work with your teacher adviser to figure out who you need to get a green light from - I'm also happy to act as a resource. I actually did take that course when I was at law school so I may be able to help out.

So we have **ME, WE** and **THEY** – **ME** is pretty simple - you just need to follow your vision. But when you need to persuade other people you need a bit of strategy. How are you going to convince other people? I suggest that the best way to start is to sit down and talk with them about your concerns.

I go to a lot of meetings – since I got elected I've met with members of Parliament, I've met with the Premier of BC and I've met with people who run big businesses – but the meeting that had the most impact on me is this one here:

Appendix 5: ME, WE or THEM?

A group of young people from my community decided to call a meeting with their local governments. When we got the invitation, most of us showed up – all three Mayors, the Chair of our Regional District and a majority of Councillors from each community, as well as a number of School Board Trustees.

This was the beginning of a conversation, and less than two months later, all three municipalities and our Regional District declared a climate crisis. These students could have started off with a protest (and there is nothing wrong with protesting), but they chose to start off by building a connection, by asking us to listen and by listening to what we had to say back. I think this is almost always the right first step - open a positive dialogue. If that doesn't work you can build to protests, but I'd suggest beginning with a conversation.

On other occasions we have had young people come and speak to Council at meetings. A group from Arden Elementary, who called themselves the Arden Ambassadors, came to Courtenay council to ask for a sidewalk (there was no sidewalk to their elementary school). By the end of the meeting a resolution was passed to do exactly that - build the sidewalk.

Most local governments (like your city, town, village or regional district and school boards too), have groups of people come to talk to them. We call these groups delegations and they come to talk about all kinds of things. If you want to suggest a change to your local government, this is a great place to start, you've got all the decision-makers in one room, you have their full attention and you have time to say what you want to say – in our council you get 10 minutes, plus time for questions afterwards.

So what do you say when you get the chance to speak with **THEM**?

I would do 5 things:

1. I would try to figure out how what they are already doing that relates to your goal. Have they taken any steps towards it? Have they tried it in the past? Have they done any studies on how to do it? If the answer to any of these questions is YES, then make sure you get that information and work it into your presentation.
2. Are there any big supporters among the decision-makers? If so, then maybe see if you can sit down with them before you make your pitch. They can probably give you useful advice about what the roadblocks might be, and hopefully how to work around them.
3. Are there other places that have already done this before? It is always helpful to point to an example to show that your idea works, and that other folks have gone ahead and done it.
4. Are there other folks in your community already working on this?
5. What common interests do you have? If you know that your school board is interested in saving money, or being more energy efficient, or supporting kids walking and biking to school, then point out there is an overlap between what you want and what they want.

Resource Links

Conversation starters about sustainability and climate change.

UN Sustainability goals course for teachers.

Lesson plans based on UN Sustainability Goals.

CULMINATING PROJECT OR DEEPER LEARNING OPPORTUNITIES

Safe Drinking Water Foundation
Take action on water issues and submit to the Canada wide Student Action competition.
www.safewater.org/

Connecting Students With Their Watersheds Manual
Connecting Students With Their Watersheds, a workbook for community leaders to inspire volunteers and develop local watershed stewardship project plans. Each module guides you through creating a personal project. The manual includes self-evaluation tools, checklists, examples, teaching tools, background information, and lots of great illustrations and ideas.
https://www.hctfeducation.ca/resource/?resourcecode=RR000293

VIDEOS

Connected by Water
Local video filmed in the Comox Lake watershed.
https://www.youtube.com/watch?v=pcmEhHGVYes

Love Your Raindrop
Funny video describing how our fresh water gets to us through the story of a raindrop - snow to sea in the Comox Valley Regional District infrastructure.
https://www.youtube.com/watch?v=8zg2cWtXb-4&feature=player_embedded

Fresh Water Scarcity: An Introduction
A video about conservation and sharing the Earth's water source. Three minutes.
https://www.youtube.com/watch?v=otrpxtAmDAk

Watershed for Beginners
The Comox Lake watershed is an interconnected system of mountains, forests, rivers, creeks and wetlands that form an ecological corridor that links Vancouver Island mountains with the Salish Sea. In this video learn about what a watershed is, the history of the Comox Lake watershed, how it's managed today and what you can do to safeguard it.
youtube.com/watch?v=W49hw96N2ro&feature=youtu.be

Appendix 6: Additional Resources

FIELD TRIPS AND LOCAL COMOX VALLEY KNOWLEDGE

The Connected By Water Team would like to extend a special thank you to those who participated in the Environmental Educators meeting in August 2018 and the online educators discussion that followed. Shared at that meeting were what role groups are currently playing in providing water-related education to children in the Comox Valley. Resources were shared and ideas exchanged about how to work together to sustain environmental education in the Comox Valley. Many of those resources are included below.

Go Grants
The Habitat Conservation Trust Foundation provides grants that can assist with covering costs like transportation for placed-based outdoor learning.
https://www.hctfeducation.ca/go-grants/

Morrison Creek Streamkeepers
Offer walking tours.
http://morrisoncreek.org/

Tsolum River Restoration Society
Excellent group of volunteers working to restore and build awareness about the Tsolum River. Offer education and outreach programs at your school's closest creek.
https://www.tsolumriver.org/

Project Watershed
Excellent resources for Grades K - 7 with links to lesson plans, field trip options, information sheets and colouring pages.
https://projectwatershed.ca/glacier-to-estuary/#upper

Cumberland Community Forest Society
Walking tours of the Cumberland Forest available.
http://www.cumberlandforest.com/

Strathcona Wilderness Institute
Guided walking tours.
https://strathconapark.org/swi-events/

Wild Schools Program - Habitat Conservation Trust Foundation
School programs available. Schools need to apply by March 31st.
https://hctf.ca/education/

BC Hydro - Explore Conservation Resources
Activities related to the hydrologic Cycle for grades k-12
https://schools.bchydro.com/activities/conservation

MARS - Wildlife Rescue Center
School tours and guest speakers available.
https://marswildliferescue.com/visiting-mars-with-a-class-or-group/

Appendix 6: Additional Resources

Comox Valley Nature Kids
Kid friendly outdoor learning opportunities.
https://naturekidsbc.ca/comox-valley-ync/

North Island Wildlife Recovery Centre
School visits can be arranged.
https://www.niwra.org/visit/

Lake Park Society
School programs available.
https://www.cumberlandlakepark.ca/programs

Climate Change and Blue Carbon in the Comox Valley
Powerpoint presentation created by Project Watershed
https://projectwatershed.ca/2018/03/08/climate-change-and-blue-carbon-in-the-comox-valley-lesson/

VIDEO

How Water Makes Climate
An original 12-minute animation that portrays the crucial connection between water cycles and the climate.
https://vimeo.com/923077768

MAPS

Local Watershed Maps
Variety of maps of the local watershed from Project Watershed
https://projectwatershed.ca/maps/watershed-maps-and-brochures/

Comox Lake Watershed Maps
https://www.comoxvalleyrd.ca/watershed

River Runner Global Map
Interactive on-line map. Tap to drop a raindrop anywhere in the world and watch where it ends up.
https://river-runner-global.samlearner.com/

WATERSHED PROTECTION

Comox Lake Watershed Protection Plan
www.comoxvalleyrd.ca/watershedprotection

Think Like a Watershed brochure
http://brooklyncreek.ca/wp-content/uploads/2018/09/Watershed-Brochure-Outside1sm.pdf

Appendix 6: Additional Resources

WATER CONSERVATION

Comox Valley Regional District
https://www.comoxvalleyrd.ca/conservation

City of Nanaimo - Team Watersmart
https://www.rdn.bc.ca/team-watersmart

Green Facts
Provides scientific facts about water as a resource.
https://www.greenfacts.org/en/water-resources/index.htm

Safe Drinking Water Foundation
Fact sheets on a wide variety of topics related to drinking water
https://www.safewater.org/fact-sheets

POLICY AND LOCAL GOVERNANCE DOCUMENTATION

Comox Lake Watershed Protection Plan
https://www.comoxvalleyrd.ca/watershed/watershed-protection-plan

Water Sustainability Act 2016
https://engage.gov.bc.ca/watersustainabilityact/

WATER SAMPLING FOR SAFE DRINKING WATER

Elementary Operation Water Drop Kit for Delivery
Students in grades four to eight can use this kit to test their local water and control water samples for eight different components.
https://www.safewater.org/school-programs-overview/
Students will test for alkalinity, ammonia, colour, copper, pH, sulphate, total chlorine and total hardness.
https://www.safewater.org/order-kits/

STORAGE AND CONSERVATION - GROUNDWATER

It's Called Ground Water
Groundwater is an important source of fresh water for industries, municipalities, farms, and rural homeowners in British Columbia.
https://www.youtube.com/watch?v=VtIY4FYWJV8&feature=youtu.be

FIRE

Learn about Fire with the Sierra Club of BC
In this curriculum, you'll find four unique environmental lessons filled with activities, stories and teachings.
link:https://sierraclub.bc.ca/fire-resource/

Appendix 6: Additional Resources

OTHER RESOURCES

Climate Reality
www.climaterealityproject.org/sites/default/files/climate-science-and-the-classroom-07-2019.pdf

Annual Student Water Challenges
www.freshwateralliance.ca/

Parks Canada Science and Conservation
Learn how Parks Canada is protecting species, habitats and ecosystems.
www.pc.gc.ca/en/nature/science?utm_source=eecom.org&utm_campaign=scienceconservation_conservation

Appendix 7:

Indigenous Education Resources Related to Watershed Protection/Water Conservation

Contributed to by: Gail Martindale, Lynn Swift, and Lelaina Jules of School District #71 Indigenous Education Department.

Learn 71 - Teacher Resources Indigenous Education
https://www.comoxvalleyschools.ca/indigenous-education/

Legend of Queenesh
https://www.comoxvalleyschools.ca/indigenous-education/legend-of-queneesh/

Fish Traps
SD71 The Fish Trap Experience
https://www.comoxvalleyschools.ca/indigenous-education/fish-traps/

The Komoks Estuary Speaks
https://youtu.be/uD2hbAIBwKs

Komoks Estuary a Cultural and Archeological Treasure
https://youtu.be/csTJLpjCXDQ

Komoks First Nation Origin Stories
https://komoks.ca/cultures/#story

Water the Sacred Relationship - Video
Full Video: **https://www.sacredrelationship.ca/documentary/**
Short Video: **https://www.youtube.com/watch?v=tyuVWksDJmA&feature=youtu.be**

Honour Water
A singing game for healing water available for ipads
http://www.honourwater.com/#intro

Indigenous Ways of Knowing: Components of an Indigenous Science Education Model Page 42
Suggestions for Teaching on pg. 49 and 50
https://pressbooks.bccampus.ca/knowinghome/