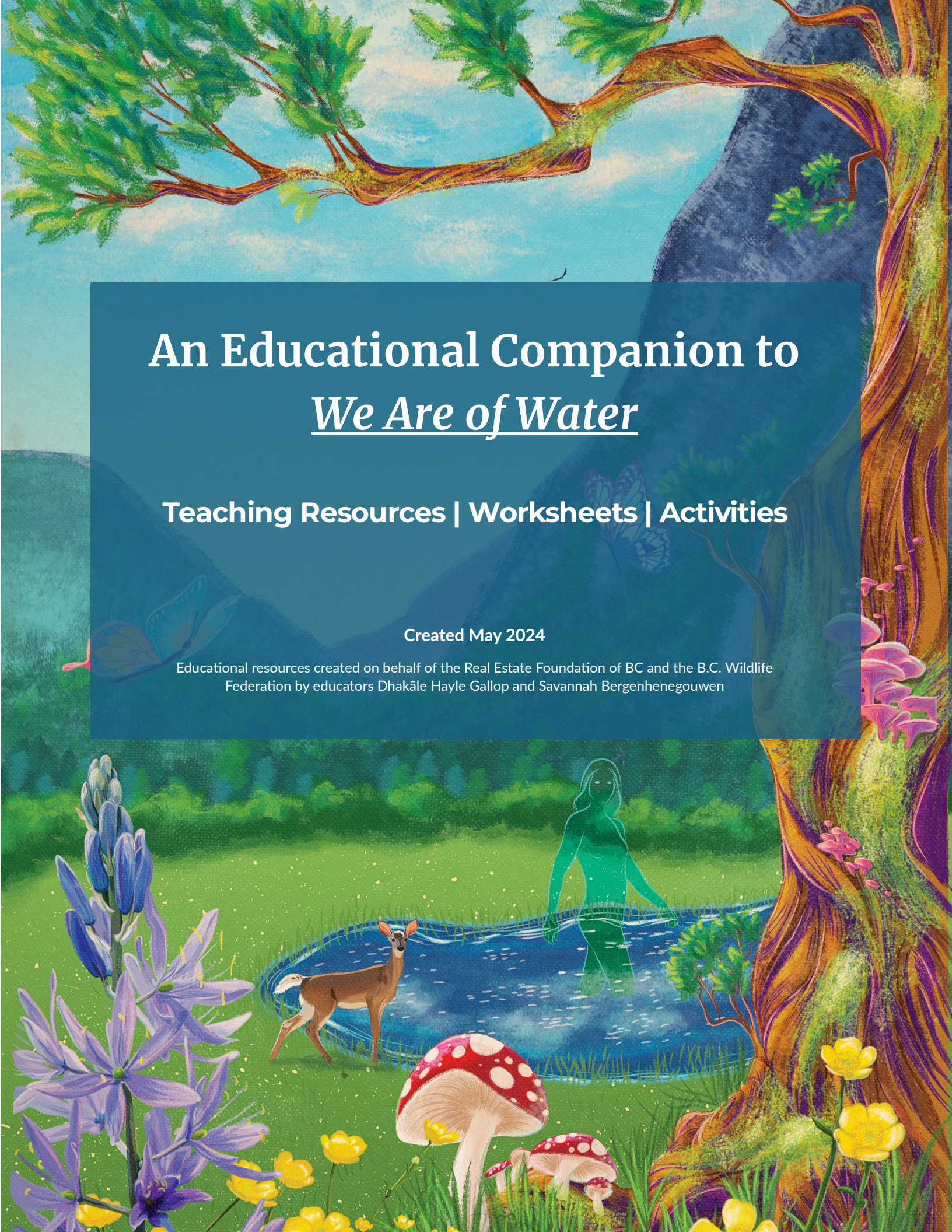

An Educational Companion to *We Are of Water*

Teaching Resources | Worksheets | Activities

Created May 2024

Educational resources created on behalf of the Real Estate Foundation of BC and the B.C. Wildlife Federation by educators Dhakāle Hayle Gallop and Savannah Bergenhenegouwen

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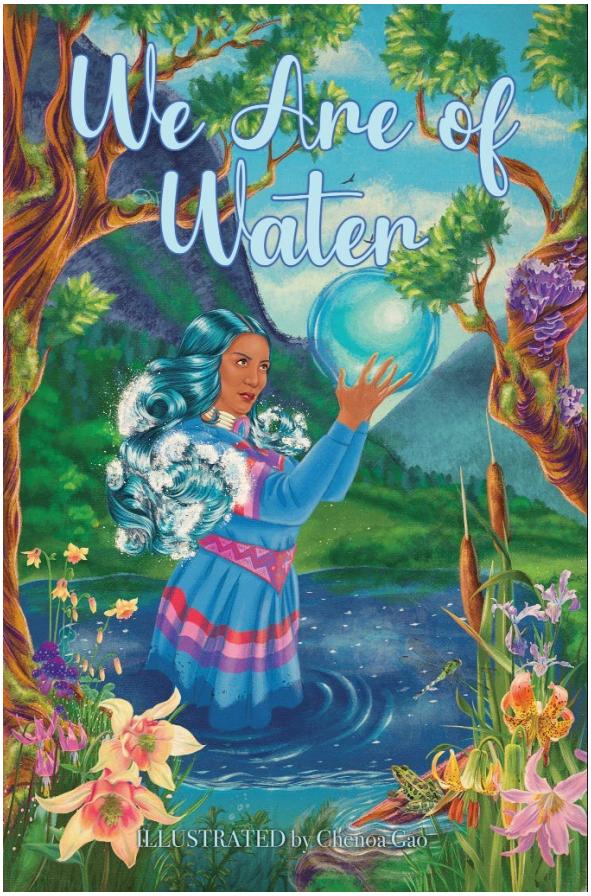
About *We Are of Water*

We Are of Water, illustrated by Chenoa Gao provides visuals connected to voices and knowledge shared by Indigenous Elders, youth, and community members through Healthy Watershed Initiative projects on the significance of watersheds and water.



"Water has a life of its own. We need to honour it. We need to respect it. We need to allow it to be free to do the work that it needs to do. Like water, the voices and illustrations of Indigenous leaders within this graphic novel are a conduit for learnings and lessons about the importance of restoring and healing the land and waterways."

We hope these illustrated stories will amplify Indigenous voices and experience, embrace and advance inter-generational learning between youth and Elders, and foster future generations of water champions and stewards.

An online version of *We Are of Water* can be accessed through the Healthy Watersheds Initiative website - https://healthywatersheds.ca/news/we-are-of-water/

To request hard copies of the graphic novel (subject to availability) you can contact the staff at the Real Estate Foundation of BC at info@refbc.ca.

We are grateful for the passion, creative energy, and time Dhakāle Hayle Gallop and Savannah Bergenhenegouwen put in to develop these educational resources. We hope these stories and these resources will serve as a spark to one's curiosity to connect with the land and water and learn more about this land's history and those who have stewarded it since time immemorial.

To learn more about the work of the Healthy Watersheds Initiative, Real Estate Foundation of BC, and the B.C. Wildlife Federation's Wetlands Workforce project you can visit:

www.healthywatersheds.ca | www.wetlandsworkforce.ca | www.refbc.ca

We Are of Water Teaching Resource

The purpose of this illustrated novel is to provide visuals connected to voices and knowledge shared by Indigenous Elders, youth and community members, throughout British Columbia, and to highlight the significance of watersheds and water. It is our hope that these illustrated stories will amplify Indigenous voices and experience, embrace and advance inter-generational learning between youth and elders, and foster future generations of water champions and stewards. In an effort to make these stories more accessible to youth throughout BC we have provided different resources for teachers to use in the classroom.

How to use the *We Are of Water* stories in the classroom

The *We Are of Water* graphic novel can be used in its entirety, in parts, or individual stories to add authentic indigenous voices into teachers' lessons.

The novel is split into two parts. Part I focuses on Elders throughout British Columbia and the lessons and knowledge they share about water. Part II looks at several of the restoration projects happening around the province. The stories highlight the work of Indigenous led watershed projects through the voices of crew members and project leads. These stories bridge the lessons and knowledge shared by the elders with the work on the land that is being done today.

A graphic organizer is provided to guide students learning and connections to the stories. The resources attached are suitable for a range of grades and curriculums. Try assigning individual stories to small groups to read, discuss and share with the class. Have students read and respond to the attached reflection questions. Extension activities are also provided to further engage students with their learning of water.

Reflection Questions

1. Think about the format of the text. How was it reading an oral story in writing with images? Did you find the language different? How did the images add to the story? Was this an effective way to share the stories of elders?

2. What does water mean to you? What did you learn about the significance of water from the stories? Was there a story that stood out to you? Explain.

3. In the introduction graphics (p. 7) Mavis Underwood says, "We all need to do our part because climate action starts with actions like those drops of water that create ripples of change." What ways does she suggest we can do our part? In what ways are you doing your part in your own life?

4. "I was taught as a young girl to be mindful of water. Sometimes it can be dangerous. Sometimes it can be peaceful, calm" – Rena Joe (p. 12) What are examples of how water can be both dangerous and peaceful? What can happen if we are not mindful of water?

5. There are many ties between water and women in the stories. What are some of these connections? What can we learn from them?

    a. **Extend your thinking:** What connections can be made between the destruction and loss of clean water sources, and missing and murdered Indigenous Women and Girls?

6. "The Elders say, 'take it to the water'" What does Marilyn James mean by this? Can you relate this saying to your own life?

7. "If you can't have a relationship with water, you can't have a relationship with yourself" – Marilyn James (p. 15) What does Marilyn James mean with her statement? How can you relate this statement to your own life?

8. "The land will look after you, as long as you look after the land" – Faron Hambler (p. 16) How does Faron Hambler's philosophy differ from the structure of "church every Sunday, go to school Monday to Friday"? Do you think one is better than the other? Explain.

9. Diane Sandy from Bonaparte First Nation's message is to "take what you need" (p. 17). What examples are given in her story of the human impact on the environment when more than what we need is taken?

10. How did these stories represent that we can honour and uphold traditional knowledge alongside Western Science? Was there a lesson that represented this the best?

    a. **Extend your thinking:** Compare a message or story from an Elder in part I, to a story in part II, that illustrates that we can uphold our traditional knowledge alongside Western Science.

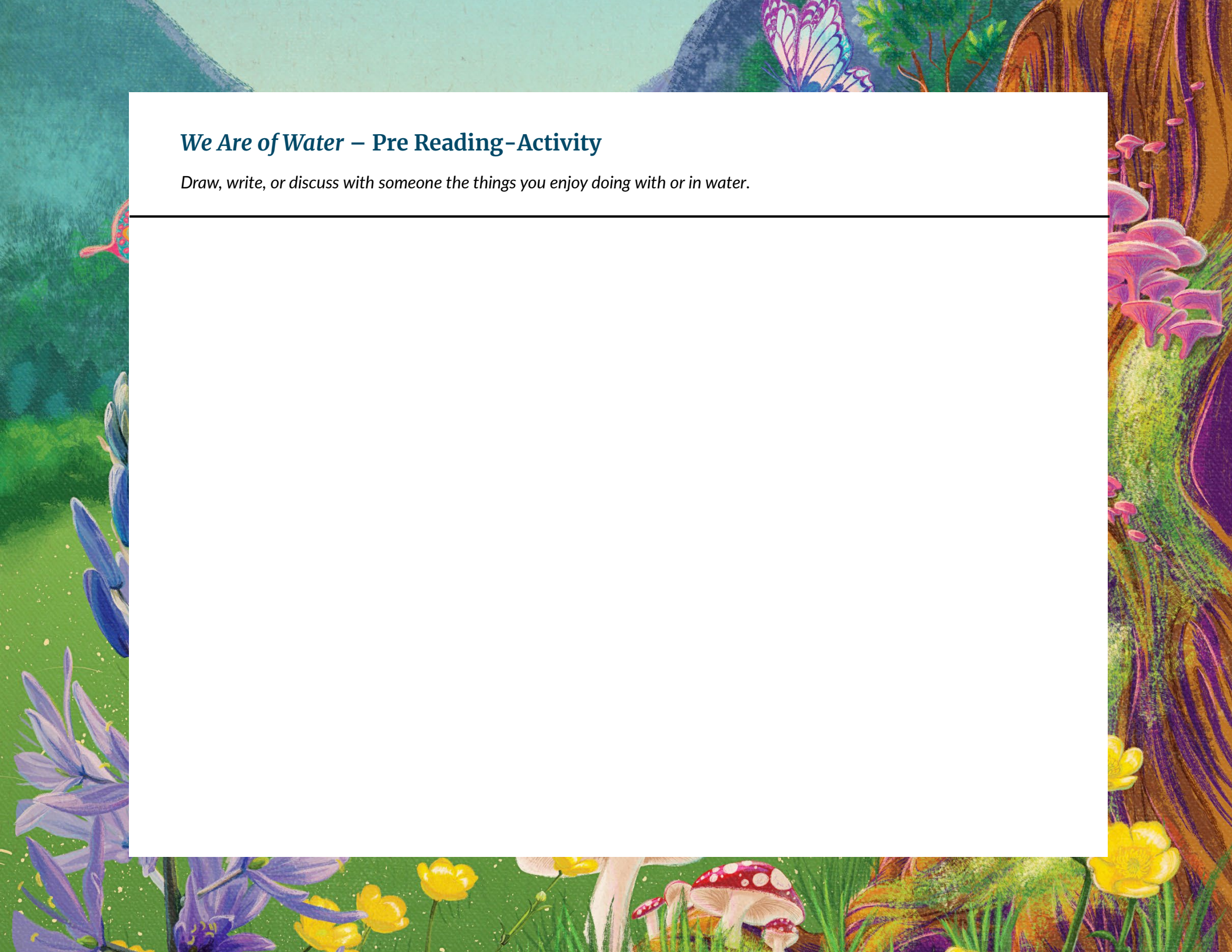
11. What makes wetlands some of the most valuable land to restore? What are some of the ways that they can be restored?

12. How does Mavis Underwood describe Indigenous relationship with land? Through reconciliation how can everyone benefit from a different relationship with the land?

13. Read Faron Hambler's story (p. 16). How is the work Taylor Wale is doing with youth (p. 26) reflect this message?

14. Kiana Medicine Crane says, "I am not different from the land and the land is not different from me." What does she mean by this? How do you relate to this statement?

15. "Water is a beautiful global connecter and accountability mechanism" (p. 41), what is meant by this? Can you provide examples.



We Are of Water – Pre Reading-Activity

Draw, write, or discuss with someone the things you enjoy doing with or in water.

Reading Guides and Activities – Part 1 – Stories from Elders

Conscious Alley
After reading part No. 1 of the graphic novel, ask this question to the students. Encourage the students to reflect on the messaging from the graphic novel. *What is the significance of water?* *If water had a voice what would they say?* Conscious Alley: Students form an alley way with two equal lines of students on either side. Everyone is quiet. A student or teacher walks through the alley. As they pass through, students respond to the question provided. This exercise often brings out beautiful and oftentimes spiritual reflections from students. The teacher can provide various questions and complete multiple rounds of this exercise. Having each student take a turn through the conscious alley.

We Are of Water – Stories from Elders (A) – Reading Guide

Using images, writing or your voice answer the following questions.

Title: Elder: Territory:	
What does the story tell you about the importance of water?	What is the elder's message to youth in sharing this story?
Write about, draw, or tell someone how you can relate this story to your own life and your relationship with water?	

We Are of Water – Stories from Elders (B) – Reading Guide

Using images, writing or your voice answer the following questions.

Title: Elder: Territory:	
What is the significance of water in the story?	What did you learn about the people, culture and territory from this story?
What is the Elder's message for youth?	Describe one image that stood out to you. What did you like about it?
Write about, draw or tell someone, how you can relate this story to your own life, and your relationship with water?	

We Are of Water – Stories from Elders – Extension Activity – Learn about your Local Water Sources

Step 1:

Answer the following questions individually or as a class about the town or city you live in, or one that you're interested in.

- What is the name of your town or city? (eg. Hope, BC)
- What are some of the major water sources? (eg. Fraser River, Coquihalla River)
- What habitats do these water sources support? (eg. Salmon spawning, beaver dams etc.)
- How do humans interact with these water sources? (eg. fishing, hydro dams, leisure etc.)
    - **Extend your thinking:** Are these interactions generally positive or negative on the natural environment? Explain.

Step 2:

Using the following website and affiliated links explore the following questions:

https://maps.fpcc.ca/languages

- What language territory is the town located on? (eg. Halq'emeylem)
- What can you learn about the language spoken in the territory?
- Is there a word for **water** in the language? https://www.firstvoices.com/
- Make a list of words related to water and their translations (eg. river, creek, salmon, etc.)
- What First Nation communities are a part of the town?

Step 3:

Make a list of questions you have related to local Indigenous Knowledge and relationship to the surrounding waters. Answer your questions by interviewing a local elder or exploring the websites of local communities. Possible questions include but are not limited to:

- How were local water sources traditionally used?
- How are the water sources used today?
- What are the traditional names of local water sources?
- Are there any stories attached to these water sources?

Step 4:

Create your own series of graphic illustrations to show your understanding and learning.

Reading Guides and Activities – Part 2 – Building Networks of Wisdom

Conservation Efforts - Research Project

After reading part no. 2, students can do their own research!
 	
Research project: Students will pick a particular First Nations, Inuit, or Metis group and research different conservation efforts that they are involved in. (students can use the conservation projects directly from the graphic novel, but they will be required to collect more information than what is provided).
 	
Students will create a powerpoint presentation or poster that includes:
• Title
• Identify which Nation is involved
  ○ Provide an introductory paragraph about the nation. Who are they? Where are they located? What language do they speak?
  ○ Provide a map of BC and label where the nation's territory is located.
• What conservation project is this Nation spearheading or participating in?
• Why is this conservation effort taking place? What is happening to the water, land, or animals?
• Has there been any progress or challenges with this project? Explain.
• Provide names of key individuals.
• Provide pictures or video content of the conservation efforts.
• Closing statement: Why do you think the work that this nation is doing is important?

We Are of Water – Building Networks of Wisdom – Reading Guide

Using images, writing or your voice answer the following questions.

<table>
<tr><td colspan="2">Project Title:

Indigenous Territory:

Water sources:</td></tr>
<tr><td>What is the project working to restore?</td><td rowspan="2">What did you learn about the wildlife, land structures and culture of the territory from the images?</td></tr>
<tr><td>What is the plan for restoration?</td></tr>
<tr><td colspan="2">What did the people in the story learn from working on the land?</td></tr>
<tr><td colspan="2">Why is this work important?</td></tr>
</table>

We Are of Water – Building Networks of Wisdom – Extension Activity – Career Explorations

Many different jobs came together to restore the lands and share the story. Choose one of the following jobs to research and answer the questions below. Your teacher may ask you to present and share your findings. https://www.workbc.ca/search-career-profiles

- Salmon Biologist
- Urban (community) Planner
- Data Scientists
- Biological Technician
- Conservation and Fishery Officer
- Graphic Designer/Illustrators

<table>
<tr><td colspan="2">Career:</td><td rowspan="3">Career Overview (Duties)</td></tr>
<tr><td>Job Openings:</td><td>Openings in your region:</td></tr>
<tr><td colspan="2">Annual Earnings:</td></tr>
<tr><td colspan="2">Education or Training required:</td><td rowspan="2">Skills Needed:
•
•
•
•
•</td></tr>
<tr><td colspan="2">Education Programs in BC
•
•
•</td></tr>
</table>

Choose one of the following and respond:

1. What interests you most about this career? What skills do you have that would make you suitable for this career? If you do not think this is a suitable career for you, explain why.

2. Explore one of the job postings related to this career. What are some of the job requirements (availability, education, fitness etc.)? What are the tasks of the job? What skills do you have that would make you suitable for this job?

Water of the World Demo

Materials:

- 1000 mL erlenmeyer (1)
- 1000 mL graduated cylinder (1)
- 50 mL graduated cylinder (2)
- 10 mL syringe + tubing (1)
- Blue food colouring
- Water

Procedure:

- Have 1000 mL erlenmeyer set up with 1000 mL blue water
- Pour all the blue water into the 1000 mL graduated cylinder
    - The large graduated cylinder represents the salt water on Earth.
- Take out ~25 mL of water from the large graduated cylinder using a syringe and put it into the 50 mL graduated cylinder.
    - The small graduated cylinder represents the freshwater on Earth.
    - Take out 15 mL and put this into a 50 mL graduated cylinder. This 15 mL represents all the water that is frozen and not accessible to humans.
    - There will be 10 mL left - the 10 ml of water represents the freshwater that is accessible to humans for drinking water.

Inquiry Questions:

- How much of the Earth is covered in water?
- How much of the water on earth is drinkable water?
- What different water sources are there?

Extending:

It is important to situate oneself according to place.

The classroom teacher can conduct research on the First Nations, Inuit, or Metis territories in which they live. Specifically, if the local Nation has creation stories for water. A water creation story pairs beautifully with this demo either at the beginning or end of the activity.

Interconnectedness Web

FPPL	Materials
• *This activity focuses on the reciprocal relationships we have with our peers, as well as extends to our community and the environment.*	• Yarn • Laminated pictures of animals made into a yarn necklaces

Activity 1: Classroom Knot

The class holds hands and creates a knot by tangling themselves up in the centre of the room. The aim is for the students to untangle themselves and form a circle. This activity is meant to simulate the idea of an interconnectedness web. Students will be able to see and feel how everything relies on each other in the environment.

Brainstorm ideas with the class of how organisms in the environment are interconnected.

Activity 2: Interconnectedness circle activity

The class will make a circle. Each person in the class will become an organism (They will receive necklaces to wear with a photograph of an organism). Their job is to

1. Identify which organism in the circle that would affect or be affected by them.
2. Verbally give an explanation as to how, and
3. Physically connect to that organism using a string.
4. The organism that they connect to then connects to a different organism, following the same steps.

After the class has finished, an intricate web would have been created.

What would happen if one or multiple organisms were removed from this web?

1. The teacher will ask the above question and students will provide their predictions.
2. The teacher will ask a particular species to die off.
3. Students wearing that species necklace will let go of the string.
4. Students whose species that are directly connected to the species that had died off must also let go of the string, as they would be impacted by the loss of the original species.
5. Repeat.
6. Students will have a visual of the interconnected web falling apart based on the loss of one species.

Notes:

- Species in this activity can vary depending on ecosystems.
- Print off multiple of one species for activity.

Inquiry Questions:

- What patterns of connection did we notice through this exercise?
- Can an organism affect multiple organisms? Why or why not?
- What would happen if one or multiple organisms were removed from this web?
    - *A student can physically let go of the string and step outside of the circle.*

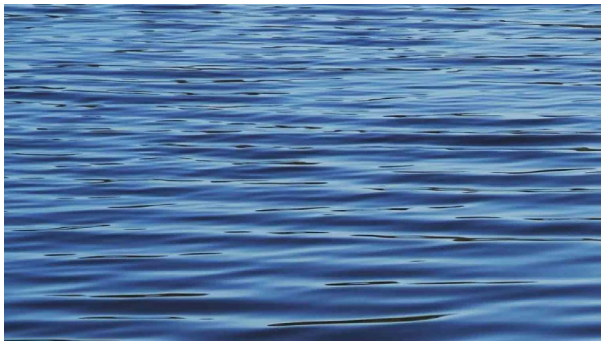
Sample Species

Algae

Krill

Octopus

Crab

Harbour Seal	Sea Lion
	
Clams	**Orca**
	
Sunlight	**Water**
	

Coho Salmon 	**Heron** 
Black Bear 	**Bald Eagle** 
Human 	**Sea Otter** 

Wetland Field Trip

Materials

- Proper outdoor gear
- paper/ziplock bags or baskets for harvesting
- Clipboards
- Worksheets
- Tea satchels
- Hot water
- Spoons
- Honey

Attached in this lesson plan are beautiful diagrams of different wetland areas. Each diagram is labelled and has extra information about the wetland depicted. Review each ecosystem with the class.

> **Bog:** A plant community that develops and grows in areas with permanently waterlogged peat substrates. Also known as moor; quagmire.
>
> **Fen:** Peatland covered by water, especially in the upper regions of old estuaries and around lakes, that can be drained only artificially.
>
> **Swamp:** Whilst authorities differ, a swamp may be defined as a vegetated area perennially flooded or saturated with groundwater. It differs from a marsh in that the latter normally has a period of desiccation.

Definitions taken from: WETLAND TERMINOLOGY | MedWet

Activity 1: Field trip

Schedule a series of field trips to visit a bog, fen, and swamp. Prepare students to visit these locations by reviewing the diagrams below. Review key vocabulary and for each visit complete the attached worksheet.

If there are any medicinal plants in the area, harvest them. When the class returns to the classroom, use twine to hang the plants so they can dry.

Activity 2: Tea

1. Ensure the plants harvested are in fact medicinal and/or used for tea. And provide a brief lesson on the plants that were harvested. What Indigenous people used the plants for etc.

2. Once the plants are dry, have students separate the flowering part of the plant from the stem. Or the leafy part of the plant (depending on which part was traditionally used).
Example: If the students harvests yarrow. Remove each flower bud from the plant. The flower bud will be the part of the plant used for tea.

3. Students will place a small amount of buds into a tea satchel.
4. Boil water and serve tea

Bog

Peatland bogs provide the most unique habitat. Bogs in Boreal and Taiga Plains region are crucial habitats for Caribou herds. The peat soil is nutrient poor and highly acidic, perfect conditions for sphagnum mosses to flourish. A thick layer of lush moss blankets the bogs; over time the moss grows up into hummocks, that are like camel humps drawing water and storing it in the mound.

<u>Carbon Sink: nature's carbon capture</u>

- bogs rich in peat trap carbon in the decomposed vegetation.
- forests are not the only carbon capture source - in fact wetlands store more carbon and at a faster rate than a forest of equal size.

1. Bog Laurel (*Kalmia microphylla*) is a bright flowering shrub that is abundant and common to bogs. Though it is poisonous, containing the compound andromedotoxin, it is used for medicinal purposes by First Nations people.

2. Labrador tea (*Rhododendron groenlandicum*) is a tall shrub featuring clusters of white flowers atop dark evergreen leaves. The underside of the leaves are fuzzy and rust coloured. The leaves are harvested to make a medicinal tea used to treat ailments such as a cold.

3. Cloud berries (*Rubus chamaemorus*) is a herbaceous flowering plant found in bogs; in fact, if you see them, it is a very good clue you are ins bog. The berries are tart with a creamy taste and notes of apple. Cloud berries are often used to make preserves and syrups for flavouring.

4. Reindeer Lichen (*Cladnia rangiferina*) grows abundantly in bogs, forming thick carpets across the ground. It is a critical food source for threatened Woodland caribou in the Boreal and Taiga plains.

5. Voles are a small mammals often referred to as mice due to their similar appearance. They can eat their weight in vegetation daily and are a food source for many wetlands predators like the screech owl.

6. The western screech owl likes to nest in tree cavities and hunt prey in the riparian zone. They are vulnerable to human activity in their habitats resulting in their population in decline.

Illustration and design by Chenoa Gao/Onedove

Courtesy of the B.C. Wildlife Federation

Fen

Fens are common to ground water fed basins, gradual seepage slopes, slow draining streams, and protected lake and pond margins. Fens have properties similar to bogs and marshes, falling between both categories. What makes fens unique are their expansive coverage of mosses. There are three categories of fen: graminoid, shrub, and treed.

Soil Composition

- Peat: undecomposed to partially decomposed organic matter, > 40 cm deep
- Mid layer contains decomposed matter
- Sandy soils with rust coloured mottles
- Non sandy soils with blue grey gleying

1. The riparian zone provides water, vegetation, escape cover, and cooling for large mammals like bears and deer, elk, caribou, and moose.

2. The wetland is a critical habitat for many species. It is shaped by the activities of beavers, muskrats, mink, otter, voles, lemmings, mice, and weasels. For example, they manage the growth of invasive vegetation and their old dens, lodges, and dams are used by nesting birds.

3. Floating mats are composed of mosses, sedges, and peat. Atmospheric carbon is taken in through photosynthesis and stored as peat from partially decomposed vegetation.

4. The aquatic areas are egg repositories and critical habitat for amphibians and reptiles. Home to 20 frog species, many of which are critically endangered.

5. Nitrogen is processed to remove excess amounts from runoff water and is converted into forms useable for plant growth.

6. Major component of hydrological systems and water quality. Filters harmful elements from ground water such as phosphates which are stored in the root systems.

Illustration and design by Chenoa Gao/Onedove

Courtesy of the B.C. Wildlife Federation

Swamp

Swamps are classified as either forested or shrubbed with dense thickets. The surface soil is permanently saturated with water that is either slow moving or stagnant. Swamps provide the main source of vegetation for moose who graze on the sedges and aquatic plants. They are also vital calving habitats for cow moose.

The Little Brown Myotis

- Little brown myotis bats are an important wetland species. Not only do they keep pest insect populations like mosquitos in balance, they are also pollinators.
- Tree hollows are common roosting sites. Increasing the availability of nesting sites by adding bat boxes to wetland sites is helping to reduce the spread of White Nose Syndrome and increase bat populations.

1. Pileated Woodpeckers are a large bird with bright red mohawks and sharp beaks used to drill holes into trees to forage for insects like ants and beetles. Woodpeckers also bore large holes in dead trees for nesting, which then become new homes for other tree dwelling animals.

2. Marsh Violet (*Viola palustris*) is a pretty little herbaceous shrub found in moist wetlands like marshes, swamps, and streams. They are a favoured vegetation for herbivorous rodents and omnivorous raccoons.

3. Raccoons are highly social and intelligent forest dwelling mammals. In many languages, they're named washing bears or washing dogs for their dextrous hands and washing behaviour when foraging for food along wetland shorelines.

4. Phantom Orchid (*Cephalanthera austiniae*) is a species at risk and grows primarily in old growth forests which have wet soils littered with decomposing foliage - like swamps. They have a symbiotic relationship with trees and fungi.

5. Pink Spirea (*Spiraea douglasii*) are a tall flowering shrub that provide habitat for grizzlies and birds like marsh wrens. They prefer to grow in the moist riparian zones of swamps and create a natural firewall as they are highly fire resistant.

6. Skunk Cabbage (*Lysichiton americanus)* is a large, waxy, broad-leafed plant found mainly in swamps. It is used by Indigenous people to wrap, store, and cook food. Bears will eat the roots after a long hibernation to stimulate their digestive system.

Illustration and design by Chenoa Gao/Onedove

Courtesy of the B.C. Wildlife Federation

We Are of Water – Field Trip Worksheet

Name: _____ **Date:** _____

Watershed: _____

1. In the space below, please provide a sketch of the watershed. In your sketch, identify the different features of the watershed.

2. What wildlife is present in the area?

3. Observe the area, are there any possible pollutants or human activity that can harm this watershed?

4. In the space(s) below, please provide a sketch of any prevalent plants in the area. Identify the name of the plant and if it is medicinal.

STEM – Build a Watershed Activity

Materials:

- Sand
- Gravel
- Large containers of Water
- Rocks
- Bins/trays
- Plants such as moss and sticks
- Buckets

After reading part II: Building Networks of Wisdom, the classroom can engage in a hands-on experiment with streams/rivers. Students can complete the accompanying worksheet.

Activity: Build a watershed

This activity can be done as a whole class activity or done in groups.

1. Fill the bin/tray being used with sand.
2. The bin/tray should be held at an angle of about 45 degrees or slightly more.
3. Slowly pour the water into the bin/tray from the side that is lifted at the 45-degree angle.
    a. The water can be collected at the bottom of the tray using a bucket.
4. As the water flows into the bin/tray, the water may start to form its own meandering pathways through the sand.
    a. Students are expected to observe the pathway that the water is taking.
    b. They may notice that the water takes different pathways.

What did you observe as the water travelled through the sand?

Would adding rock, gravel, or vegetation change the meandering path of the water?

Did you notice that the water eroded the corners of the banks as it travelled? Why do we think that is?

5. Students will engage in the activity one more time, but they will first add rocks, gravel, and vegetation to the already established pathway of the watershed.
6. Once completed, they will run the water into the bin/tray again and observe.

Did adding the rocks, gravel, and vegetation change the flow of the water in any way?

Watershed Experiment Worksheet

Name: _____ **Date:** _____

1. In the first experiment, please list your observations below.

2. Please depict your observations below.

3. In the second experiment, what did you add to the stream? And what happened?

4. Please depict your observations below.