

Session 3

Mapping Our Watersheds

Educator's Guide



Focus on learning and exploring the features of the watersheds in your area. You will be identifying well-known places, like mountain peaks and rivers, and directly connecting them to the concept of watershed systems and your local experiences.



The Big Question: What does our local watershed look like?

This session is highly inquiry-based. Learners will be diving into researching and mapping the features of the local watershed(s). In addition to watershed features, they will be locating their homes and their school, which will help draw even more connections between them and the watershed system.

Indigenous Knowledge Element

This is a great opportunity to explore the local Indigenous language further by investigating the traditional place names for local watershed features, such as mountains and rivers. If possible, a guest Elder or Knowledge/Culture-Keeper will visit the class during this session.

Indigenous language resources can be found on the *Best Water Ways* web page. If you are in a school district context, you should find assistance within your Indigenous Education department.

Preparation

Materials that you will need to facilitate this activity effectively include:

- › Grade-level appropriate Geography and Cartography textbooks and reference materials
- › Large black and white local maps. Often regional districts or municipal maps departments will print these out for you. If not, there are links to where you can source maps in the resources section
- › Local map template (see Activity 1, Part 2)
- › Watershed features labels (*Session 3: Mapping Our Watersheds Learner's Guide*, page LG3-6) can be cut out during the activity

This activity is contextual in nature, so you may need to do a bit of pre-learning about your region (unless you are already a local watershed expert!). Links to regional watershed information are listed in our web page resource section at cowichanlandtrust.ca/best-water-ways to help you with this piece. The following questions can help you to jot down some notes in preparation for this activity:

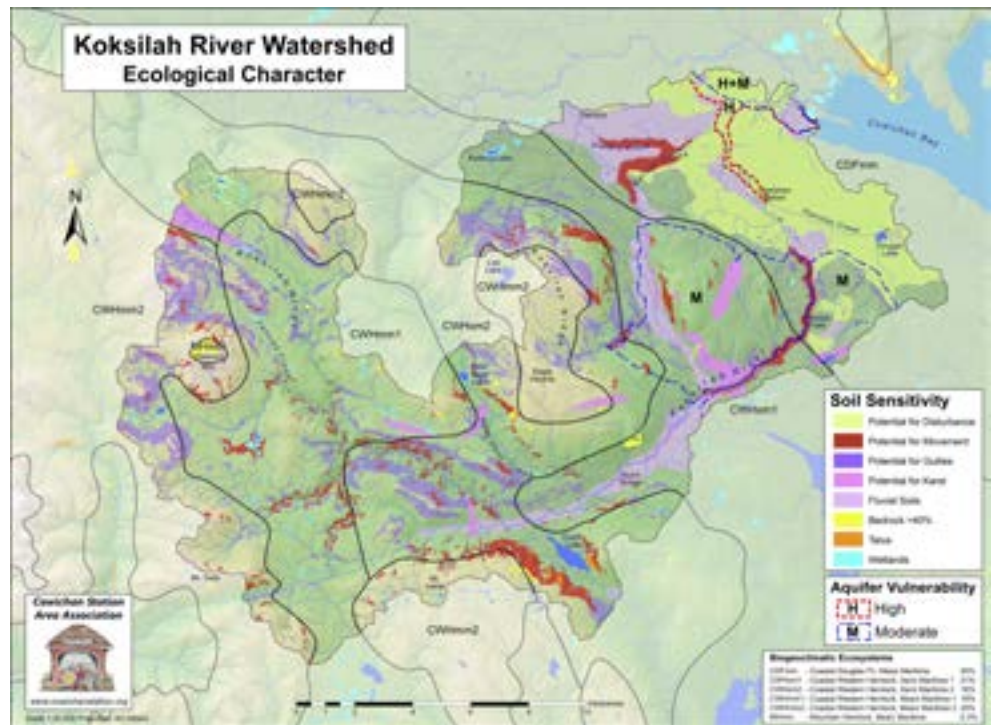
- › What is the largest watershed in your region?
- › How many watersheds are in your area?
- › Where are the watershed boundary lines?
- › What are the mountains, hills, or high spots in your area? Can you find Indigenous names for them?
- › What are the valleys, streams, rivers, marshes, estuaries? Can you find Indigenous names for them?

Introducing the Concept

Learners will be diving quickly into the learning activity, but you will probably want to lead an opening discussion around different kinds of maps (e.g., street maps, topographical maps) they will be using. It would be effective to have a few different maps available (e.g., road, topographic, climatic, political, ecosystem) to demonstrate the diversity of maps that exist.

An example of a type of Ecosystem Map from a Koksilah River Watershed assessment report (2019).

Courtesy of the Cowichan Station Area Association



Learning the Content

Break the learners into small, even-numbered groups. Follow the directions for Activity 1 in the Session Activity Plan (page AP3-3). Learners will map out the watershed features in their groups, and in the process, explore the “Words and Terms” below.

Words and Terms

Contour lines and intervals a contour line is a line drawn on a topographic map to indicate ground elevation or depression. Contour lines never cross. A contour interval is the vertical distance or difference in elevation between contour lines.

Ecosystem map a map that represents ecosystem characteristics and relationships of a given area.

Elevation distance in height above sea level.

Gully a deep narrow water-worn ravine, often with water flowing through as a stream or river.

Indigenous place names of mountains or other features, according to location.

Physiography collective physical features such as slope, shape, and elevation of an area.

Slope how steep the land is, how much vertical rise in elevation there is for a certain horizontal distance. Rise over run.

Topographic map a type of map showing natural and/or physical features of a landscape, including contours and elevation.

Valley a stretched-out groove in the land that has higher ground on three sides and usually has water flowing through the center. Usually V- or U-shaped.

Watershed boundary line the line that divides the watershed and where water will flow. A raindrop that lands on one side of the boundary will flow into one body of water; a drop that lands on the other side will flow into a different body of water.

Evaluating the Learning

Watershed Wiz Quiz Game

This is an optional activity. For instructions, see the Session 3 Activity Plan (page AP3-4).

Watershed Reflection

The “Watershed Reflection” activity encourages learners to process what they have learned, and make connections to their own life and experience. Reviewing this component of their Learner’s Guide is a valuable way to help you assess the level of learning and comprehension in your group, and provide some guidance towards ideas you may want to revisit through the rest of the projects and beyond.

There are several key learning outcomes to look for within the reflection component of this session. Students should be able to:

- › Identify the largest watershed system in the area
- › Name two smaller watershed systems in the area
- › Name two mountains in the area and which watershed they belong to
- › Practice local Indigenous language place names for watershed features
- › Identify a stream in the area and which system it belongs to
- › Identify two rivers in the area
- › Identify a marsh in the area
- › Name an estuary in the region

Sharing Circle

Take a few moments to sit in a circle and invite participants to share something from their “Watershed Reflection”.

Mapping Our Watersheds: Grade Curriculum and Competency Connections

For detailed information visit <https://curriculum.gov.bc.ca/curriculum/science>

Grade Level and Subject	Content Connections	Curricular Competencies
Grade 9 Science	<ul style="list-style-type: none"> • Matter and energy cycles • Sustainability of systems • First Peoples knowledge of interconnectedness and sustainability 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 9 Social Studies	<ul style="list-style-type: none"> • Physiographic features of Canada 	<ul style="list-style-type: none"> • Use Social Studies inquiry processes and skills to ask questions; gather, interpret, and analyze ideas; and communicate findings and decisions
Grade 11 Earth Science	<ul style="list-style-type: none"> • The distribution of water and its influence on weather and climate. • Water as a unique resource • First Peoples knowledge and perspectives of water resources and processes 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 11 Environmental Science	<ul style="list-style-type: none"> • Energy of water flow through ecosystems • First Peoples ways of knowing and doing 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 11 Science for Citizens	<ul style="list-style-type: none"> • Scientific processes and knowledge inform our decisions and impact our daily lives • Scientific understanding enables humans to respond and adapt to changes locally and globally 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating

Grade Level and Subject	Content Connections	Curricular Competencies
Grade 12 Environmental Science	<ul style="list-style-type: none"> • Human actions affect the quality of water and its ability to sustain life • Human activities cause changes in the global climate system • Living sustainably supports the well-being of self, community, and Earth 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating
Grade 12 Specialized Science	<ul style="list-style-type: none"> • Biodiversity is dependent on the complex interactions and processes between biotic and abiotic factors • Climate change impacts biodiversity and ecosystem health 	<ul style="list-style-type: none"> • Questioning and predicting • Planning and conducting • Processing and analyzing data and information • Evaluating • Applying and innovating • Communicating

Notes

Activity Plan

Session 3: Mapping Our Watersheds



Big Idea/Inquiry

What does our local watershed look like?



Time

Approximately 2.5 hours

Indigenous Knowledge Element:

Indigenous names of the Traditional Territory/local mountains/high ground

See online regional resources at cowichanlandtrust.ca/best-water-ways. Alternative: if you are in an area without distinct mountains or high ground, what other features have Indigenous names (lakes, rivers, etc.)?



Purpose

The purpose of the session is for students to name, and become familiar with, the features of the watershed(s) they live within.



Handouts/Materials

- *Learner's Guide—Session 3: Mapping Our Watersheds*
- Grade-level appropriate textbooks and reference materials (Geography/Cartography)
- Local topographical hard copy and digital maps
- Large map template
- Labels for watershed features (*Learner's Guide*, page LG3-6)
- Magazines with watershed images
- "Watershed Wiz Quiz" game cards (this guide, page AP3-5)



Equipment Needed

- Computers with internet access



Learning Goals

To gain a basic understanding of the watershed systems in your region.

Learning Outcomes

Students should be able to:

- › Identify the largest watershed system in the area
- › Name two smaller watershed systems in the area
- › Name two mountains in the area and which watershed they belong to
- › Practice local Indigenous language place names for watershed features
- › Identify a stream in the area and which system it belongs to
- › Identify two rivers in the area
- › Identify a marsh in the area
- › Name an estuary in the region

Key Learning Points

From your preliminary research, identify these key learning points for your context:

- › What is the largest Watershed in your region?
- › How many watersheds are in your area?
- › Where are the watershed boundary lines?
- › What are the Indigenous and common names of mountains, hills, or high spots in your area?
- › What are the valleys, streams, rivers, marshes, estuaries?

Introducing the Topic

To introduce this topic:

- › Discuss the fact that there are many, different kinds of maps used to organize and locate information. For example, standard road maps help you navigate an area, whereas political maps show information about how people have voted in different areas. Ecosystem maps are becoming more commonly used to help inventory ecological characteristics of an area.
- › Cultural maps focus on information such where different languages are spoken, and Indigenous communities are located. Use this time to share Indigenous names for the traditional territory and watershed features in your area.
- › Direct learners to read through the introductory section of their *Session 3: Mapping Our Watersheds* Learner's Guide, either independently or in small groups.



Activity 1: Research and Map Our Watershed

Part 1	<ol style="list-style-type: none">1. Divide into four groups (or more, depending on your class size).2. Using local topographic maps (hard copy and digital), have each group explore, find, and answer the inquiry questions found on page LG3-3 of their Learner's Guide
Part 2	<ul style="list-style-type: none">• Provide a large map template that has basic topographical features of your area.• Using the same groups as in Activity 1, have learners label the names of mountains and high ground features, and details like rivers and lakes. They can shade in the contour lines according to the slope, and could also collage on the map with magazine images such as forests, mountains, towns.• Have each student draw in or label (generally) where they live on the map.



A visit to your local salmon hatchery is a great way to connect watershed health with the wellbeing of salmon species.

Photo: Stephanie Cottell

Closing the Session

Summarizing and Reflecting: Have learners complete the following activities.



Activity 2: Watershed Wiz Quiz (optional)

Each group carefully takes their maps from Activity 1, and tapes or pins each map at the front of the room so everyone can see.

Put notebooks away and let the quiz begin! Learners will draw a word or term from a container and match it with a corresponding example on one of the maps, explaining what it is using the example.

When they get it right (maybe with a little help from their friends), they get to pick who goes next!



Activity 3: Watershed Reflection

Recommendations for transitioning to this activity:

- Share a bit about what you are reflecting on at this stage of the session.
- Direct learners to page LG3-5 of their Learner's Guide to work independently through this activity.

There are several key learning outcomes to look for within the reflection component of this session. Refer to page EG3-4 of the *Mapping Our Watersheds* Educator's Guide for details.

Review each student's entry to help in evaluative.



Activity 4: Sharing Circle

Take a few moments to sit in a circle and invite participants to share something from their "Watershed Reflection".

Watershed Wiz Quiz

"Mapping Our Watersheds" Words and Terms

Topographic Map	Elevation
Ecosystem Map	Contour Lines and Intervals
Valley	Gully
Watershed Boundary Line (Or Divide)	Slope
Indigenous Place Names of Mountains	Indigenous Place Names of Rivers or Other Features

