

Lesson 1-2: Introduction to the Nechako Watershed

Time of Lesson: 1.5 hours

Rationale: The purpose of this lesson is to introduce the Nechako watershed and for the students to develop a sense of place. People's empathy for special places strengthens their commitment to stewardship of our natural environment. Additionally, our local history is strongly tied to the Nechako River, as First Nations along with the first explorers and settlers used the Nechako River and the rivers within the watershed for survival. Constructing a sense of place has a key role in developing education and interpretation material about our natural and cultural environment.

Instructional Objectives: Students can define the Nechako watershed and locate the Nechako watershed on a map, understand the parts of a watershed (rivers, land and riparian zone). Can explain how individuals and their actions can help conserve the Nechako watershed.

Strategies and Activities: Outside activity to grasp concept of a watershed, in class discussion.

Materials:

- Watershed observation activity: paper and pencils (outdoors)
- Watershed activity: paper, blue wet erase markers, water bottles (outdoors)
- SMARTboard PowerPoint presentation: *Map of the Nechako Watershed*
- Classroom Map: map of the Nechako Watershed, coloured sticky dots, post-its, pins, markers etc.
- Handout or Interactive: *Worksheet 1c - Crossword*. See CD for interactive version.

Student Assessment:

- Observation and participation in class and small group activities.
- Ability to identify features and locations on a map that relate to watersheds.
- 'Ticket out the Door' "Name one factor that influences a watershed."

LESSON PLAN

Activity (15 minutes)

Collect materials for outdoor activity: paper (2 per student), blue wet erase markers, pencils, water bottle.

Tell your students that you will all now practice the first part of the scientific method: **observation** by making detailed observations of their watershed. Part of being a good scientist is making **detailed observations** and **effectively communicating or describing your observations to another person**. Have the students take their paper and pencil with them and quietly line up to go outside and observe their watershed. This is an individual activity.

Take the class outside to the playing field, playground, forested area, or open area. The location of this activity is not important, other than the fact that students need to be able to see a distance away.

Have them form a circle and then turn to face outside of the circle, take three big steps and sit! They should be fairly evenly spaced with at least two metres between each student. Now they are to write/draw everything they observe for ~5 minutes in silence, no discussion. Note that you have not defined a watershed yet or even much discussed the topic with the students. If some ask what they are supposed to observe, direct them to write/draw whatever they see before them (could be houses, buildings, play ground equipment, grass, trees, storm drain, cars, people, squirrels, ants etc.)

Have the class gather around and discuss the different observations they made of their watershed.

Ask

When rain falls on all of the things you just observed in your watershed, where does it go?

Transition to next activity.

Activity (10 minutes)

Divide into small groups. Tell the class they will be making model watersheds simply by crumpling up a piece of paper.

Pass out one blank sheet of paper and one blue wet erase marker to each group of three students.

One student crinkles the paper into a tight ball and then gently pulls the paper flat again without smoothing the paper entirely. The paper should look like a mountainous relief map.

The second student traces the **ridges** (high points) on the paper with the blue wet erase marker without going down into any of the valleys.

Ask

What will happen when the model watershed is “rained” on?
Specifically, ask them where will the water go?

Before spraying the model, tell the students you want them to observe the direction of water flow. A drop of water will roll down one side of a ridgeline into one watershed or roll down the other side and enter another watershed. The wet ink should show this pattern.

The third student “rains” on the piece of paper by gently squirting with the water bottle. Enough rain will run the blue marker down the “hills” into “river valleys”.

Ask

What happened to the blue marker? Where did it run? *Your discussion should lead them to the understanding that the high points or ridgelines on their model watershed define the boundaries of a watershed.*

What watershed are you in now? *Nechako Watershed*

Watershed (or Basin): The area of land where all of the water that is under it or drains off of it goes into the same place – either a lake, marsh, stream, river or groundwater.

Sub Basin: A watershed within a watershed - a smaller river drainage.

Tributary: A river that flows into a main stem river or lake. It does NOT flow into the sea or ocean.

Return to classroom for next activity.

Activity (25 minutes)

Show *Map of the Nechako Watershed* PowerPoint presentation. Stop presentation at “Why are we learning about watersheds?”.

Ask

Why are we learning about watershed? *Because we live within it and our actions influence our water and other living things around us.*

What are some of the human uses of lands within a watershed?
Identify which have positive and negative impacts on water.

- farming and agriculture
- forest harvesting
- reservoirs, dams and waterworks
- sewage disposal
- landfills
- towns
- industrial sites
- roads
- culverts
- ports and harbours
- First Nation food, social and cultural
- fisheries
- recreational land activities (eg. ski resorts)
- recreational water activities (eg. boating)
- fishing
- transportation by water
- ditches and storm drains (water disposal)
- tree planting
- restoration projects
- recycling

Continue showing *Map of the Nechako Watershed* PowerPoint presentation.

Key Points

Stop at the slide “The Nechako Watershed” point out your community, Prince George where the Nechako flows into the Fraser River, the river’s path, the boundary of the watershed, any other interesting points for the students.

Flip to the next slide for facts about the Nechako watershed.

Facts about the Nechako River and Watershed

- Nechako means “big river” in the Carrier language.
- The Nechako river is 290 km in length (compare distance from Prince George to Burns Lake) and is a major tributary to the Fraser river.
- Nautley River is the largest tributary.

Flip to the next slide for a quick overview of Kenney Dam and the Reservoir.

Ask

Who knows the story about why Kenney Dam was built?

- Built in 1952 in the upper Nechako. It diverted westward, generating hydroelectric power before entering the **Kemano River**. The power is used for aluminium production and electricity to north BC. As a result, the Nechako River is smaller and has a different 'hydrograph' than it did historically. This may be a potential deterrent for Nechako white sturgeon, as the river doesn't experience flushing of the system that likely cleaned the spawning grounds of sediment. This topic will be discussed in more detail in a later lesson.

Continue showing *Map of the Nechako Watershed* PowerPoint presentation.

Ask

What is a tributary? *A tributary is a stream or river that flows into a main stem river or a lake. It does NOT flow directly into the sea or the ocean.*

Can you name some of the sub basins/tributaries of the Nechako watershed?

- Cheslatta River
- Nautley River
- Stuart River
- Chilako River
- Endako River
- Stoney creek
- Murray Creek
- Chilco Creek
- Clear Creek
- Sinkut River etc.

Activity (15 minutes)

Present the hardcopy map of the Nechako watershed to the class. Pin on the wall or place on a table and have student identify lakes, rivers and key features and locations on the map. Use pins, sticky post-its, markers or labels as works for your class.

Ask

What things can we do as individuals or as a community to improve the watershed environment for the Nechako white sturgeon?

Leave the map on the wall of the classroom for the duration of this course as a reference for later lessons.

Activity (10 minutes)

Hand out hardcopy or use interactive version on SMARTboard of *Worksheet 1c*. This activity can be take home or in class depending on the time.

Closure (10 minutes)

Review what the students learned about watersheds today and why watersheds are important.

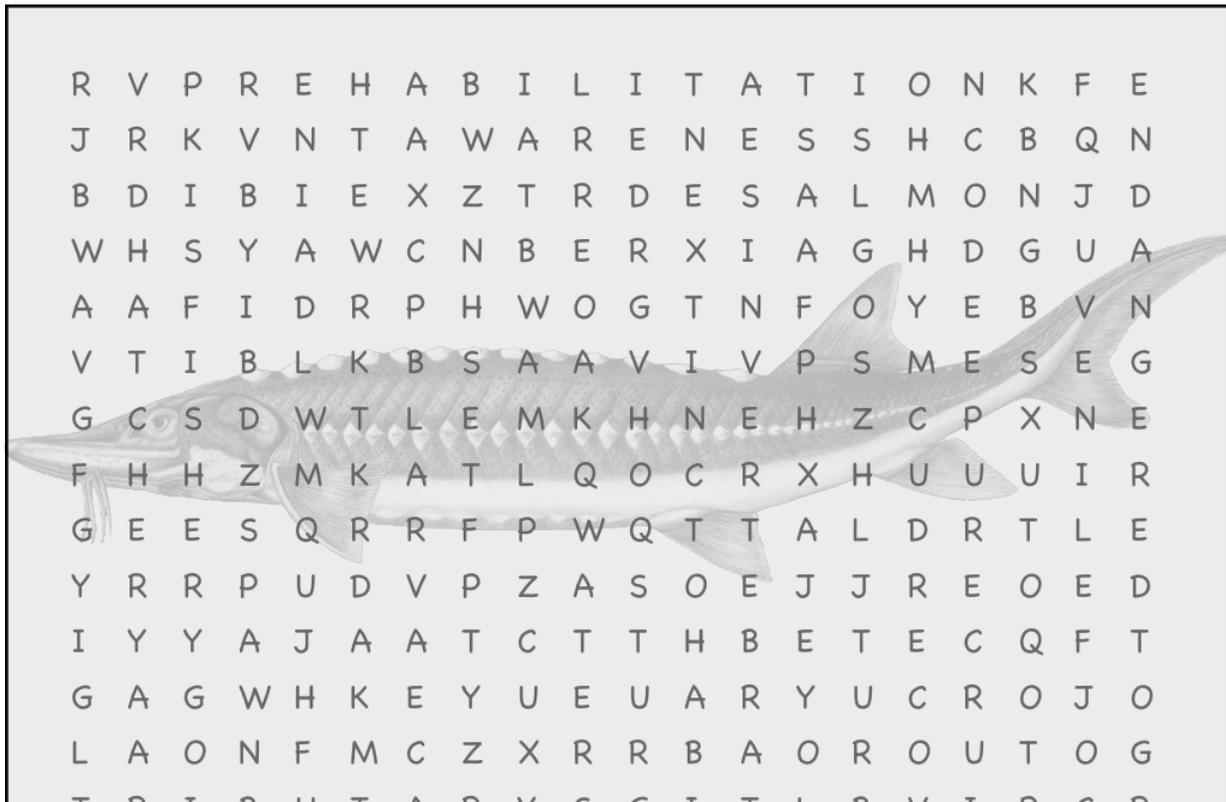
Ask

How does all the activity humans do within a watershed influence animals such as the Nechako white sturgeon?

What can we do differently to make things better for Nechako white sturgeon?

Nechako White Sturgeon

Crossword



Across

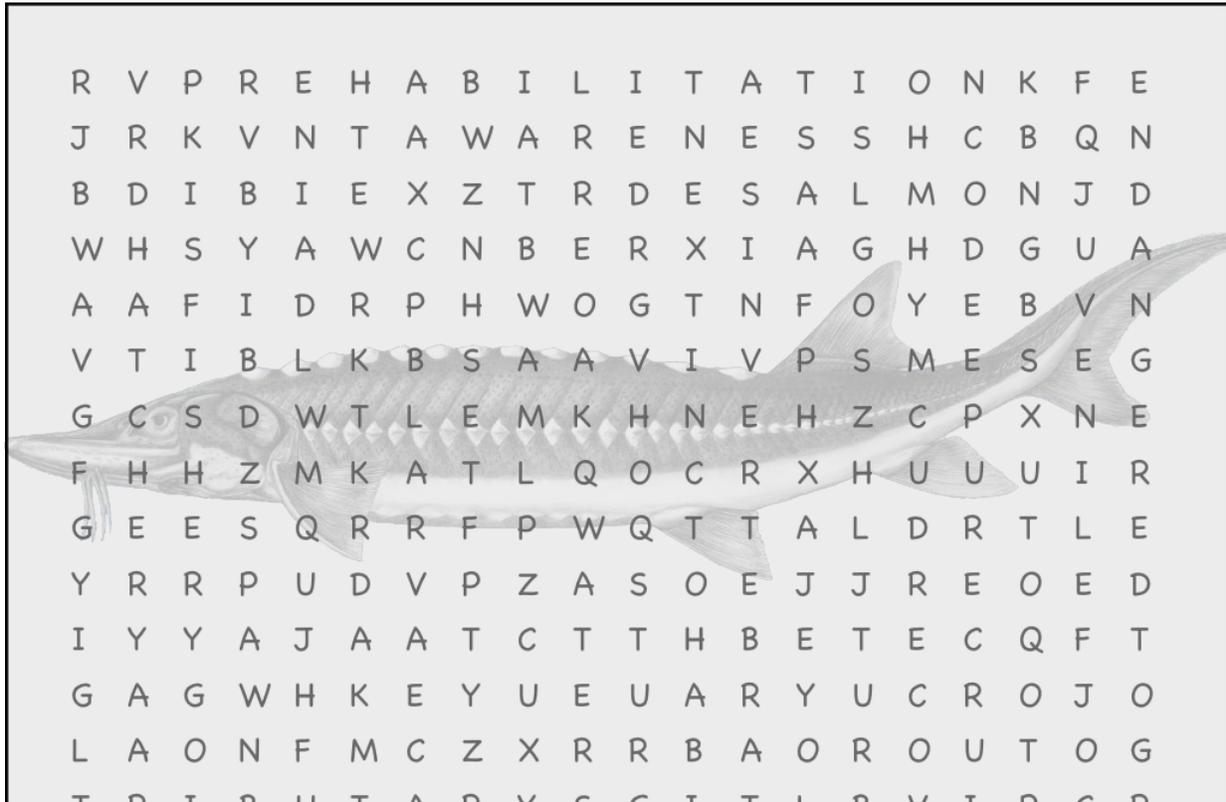
- 3) A river that flows into another river or lake.
- 6) The high point of a watershed.
- 7) A way that people educate others about important topics and issues.
- 9) Means 'big river' in Carrier.
- 10) The low point of a watershed.
- 11) Chemicals and other toxins _____ the Nechako River.
- 12) Water from the Nechako River is diverted west to generate power before entering the _____ River.

Down

- 1) The area of land where all of the water that is under it or drains off of it goes into the same place.
- 2) Taking detailed _____ of our surroundings helps us learn and understand our environment better.
- 4) Kenney Dam creates a _____ .
- 5) The largest sub basin of the Nechako watershed.
- 8) A channel that carries downhill.

Nechako White Sturgeon

Crossword - ANSWER KEY



Across

- 3) A river that flows into another river or lake. [TRIBUTARY]
- 6) The high point of a watershed. [RIDGE]
- 7) A way that people educate others about important topics and issues. [AWARENESS]
- 9) Means 'big river' in Carrier. [NECHAKO]
- 10) The low point of a watershed. [VALLEY]
- 11) Chemicals and other toxins _____ the Nechako River. [POLLUTE]
- 12) Water from the Nechako River is diverted west to generate power before entering the _____ River. [KEMANO]

Down

- 1) The area of land where all of the water that is under it or drains off of it goes into the same place. [WATERSHED]
- 2) Taking detailed _____ of our surroundings helps us learn and understand our environment better. [OBSERVATIONS]
- 4) Kenney Dam creates a _____. [RESERVOIR]
- 5) The largest sub basin of the Nechako watershed. [NAUTLEY]
- 8) A channel that carries downhill. [RIVER]

GRADE: _____ TEACHER: _____

Feedback Form for Unit 1 - Lesson 1-2

Please fill in the information below. If you have additional comments, please make them directly in the lesson plan. Please feel free to email me any immediate concerns: michelle@mrconcepts.ca.

Background Information:

Was there enough information provided to conduct the lesson successfully?
Yes or No

If no, what additional information and/or resources would be useful for this lesson?

Activities:

Were the activities engaging to the students? Yes or No

Was the timeline of the activities a good estimate?
Too Long ____ Too Short ____ Just Right ____

Any comments?

Worksheets:

Were the worksheet(s) effective in teaching and/or reviewing the lesson material?
Yes or No

Was the answer key helpful? Yes or No

Additional Resources:

If used, were the resources suggested or provided for this lesson useful? Yes or No

What else would you suggest be needed for this lesson?