Lesson 2-1: Watersheds

Time of Lesson: 1 hour

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: Student can identify the Nechako watershed, and define the areas of a watershed and how they are linked together.

Strategies and Activities: Review from introduction to watersheds, activity sheet and watershed demonstration kit.

Materials:

- Handout: *Worksheet 2a - Watersheds*
- SMARTboard activity: *Watershed Definitions (.notebook file)*
- Demonstration: *Watershed Demonstration Kit.* It is recommended that teachers be familiar with the unit before presenting to the class. The Kit is available upon request. Please contact the Nechako White Sturgeon Recovery Initiative to sign out the Kit.
- Digital Image: *Nechako Watershed.jpg*

Student Assessment:

- Observation and participation in class and small group activities.
- Ability to identify features and locations on a map that relate to watersheds.
- Ability to relate our actions within the watershed as negative or positive toward watershed health.

LESSON PLAN

Introduction (5 minutes)

Introduce the new Unit and the rational:

- To identify watersheds and riparian zones and relate to biodiversity, river habitat and Nechako white sturgeon.
- To gain a deeper awareness of the environment of the endangered Nechako white sturgeon and the many challenges the species currently faces.

Activity (5 minutes)

Quickly review what the class learned about watersheds in the introductory Unit. Write their comments on the white board.

Key Points

splits up the landscape into areas where overland and percolating water comes to a common area (river or lake).

everything we do in the watershed impacts the overall health of the watershed.

the Nechako watershed is made up of over 30 sub basins or smaller watersheds that feed the river.

a watershed is made up of many parts (eg. towns, riparian zones, lakes etc.)

Activity (10 minutes)

Hand out to the class *Worksheet 2a: Watersheds*.

Put on the SMARTboard: *Watershed Definitions*. Have the students fill in the definitions of the components of a watershed starting from the top of the watershed (ridge) to the bottom (mainstem river) working with the SMARTboard.

- Watershed: 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.
- Riparian Zone: Land immediately adjacent a river or lake. The land of the riparian zone is influenced by the water table of the river or lake.
- Tributary: A river that flows into another river.
- Mainstem River: A river that flows into the ocean or the largest river in a watershed.
- Wetland: An area of saturated land that has water tolerant plants growing. Examples are swamps, ponds and bogs.
- Watershed Divide: The ridge that separates one watershed from another.
- Sub Basin: A watershed within a watershed.
- Precipitation: A form of water that falls from the sky. Can be rain, snow or hail.
- Overland Flow: Water that flows over the land or ground.
- Percolation: Water or liquids that filters through the soil below the surface of the ground. Underground flow.
- Groundwater: Water held underground in the soil or in the pores and crevices of rocks.

Ask

What are two potential paths for water that originates at the watershed ridge to get to a mainstem river? *Water can flow overland, through developed (agricultural lands, towns, industrial areas) or natural areas (forests). Water can percolate and flow underground through the soil.*

Transition to next activity.

Activity (25 minutes)

Bring out the *Watershed Demonstration Kit*. Ask for student participation to help run the model. The model:

- shows how water flows through the soil (groundwater).
- shows how water picks up toxins and chemicals present on the surface of the ground and carries them through the soil to groundwater sources.
- shows the influence of wells on groundwater sources.

Ask

What does this model show us about how water moves through the watershed?

What actions do humans do within the watershed that influence the quality of water in our rivers and groundwater?

eg. driving automobiles releases toxins and chemicals into the air (caught by precipitation) and onto the ground (overland flow after rain) and get taken into the rivers.

eg. pesticides or fertilizers on fields percolate into the ground or get carried via overland flow into our rivers.

Transition to next activity.

Activity (15 minutes)

On the SMARTboard (digital file *Nechako Waterhshed.jpg*) or on the hardcopy map on the wall, show the map of the Nechako watershed. Ask the class the following questions, pointing out or marking their answers on the map.

Ask

Where is our community on the map?

Where is one place you went camping this summer?

Where do you go back-to-school clothes shopping?

Considering what we just learned about how water flows over and through a watershed, ask students to consider positive and negative actions in the watershed.

Ask

Which of your actions in these places negatively or positively impacted the watershed? *Answers will vary, examples include:*

long distance driving = negative
fished from shore instead of a boat = positive
biked to school today = positive
littered plastic food wrapper in the trail along the river = negative

Hand out *Worksheet 2b: The Nechako Watershed*. Have students expand on the class discussion and mark their own maps. This worksheet could be sent home or completed as a review at the beginning of the next lesson.

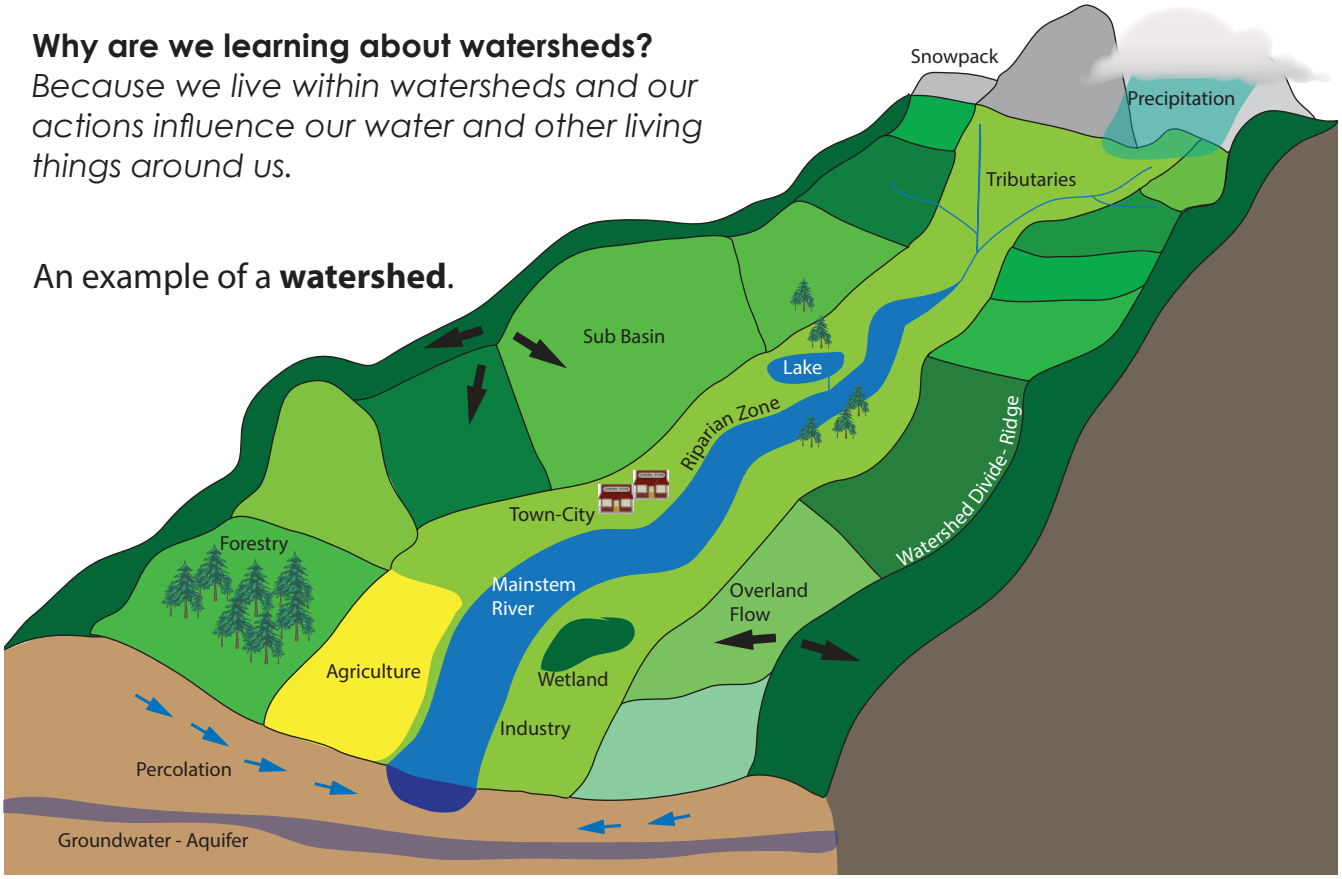
Closure (5 minutes)

Ask students to make note of their actions for the rest of the day and what those actions mean to the watershed.

Watersheds

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

An example of a **watershed**.



Definitions

Watershed: _____

Riparian Zone: _____

Tributary: _____

Mainstem River: _____

Wetland: _____

Watershed Divide: _____

Sub Basin: _____

Precipitation: _____

Overland Flow: _____

Percolation: _____

Groundwater: _____

The Nechako Watershed

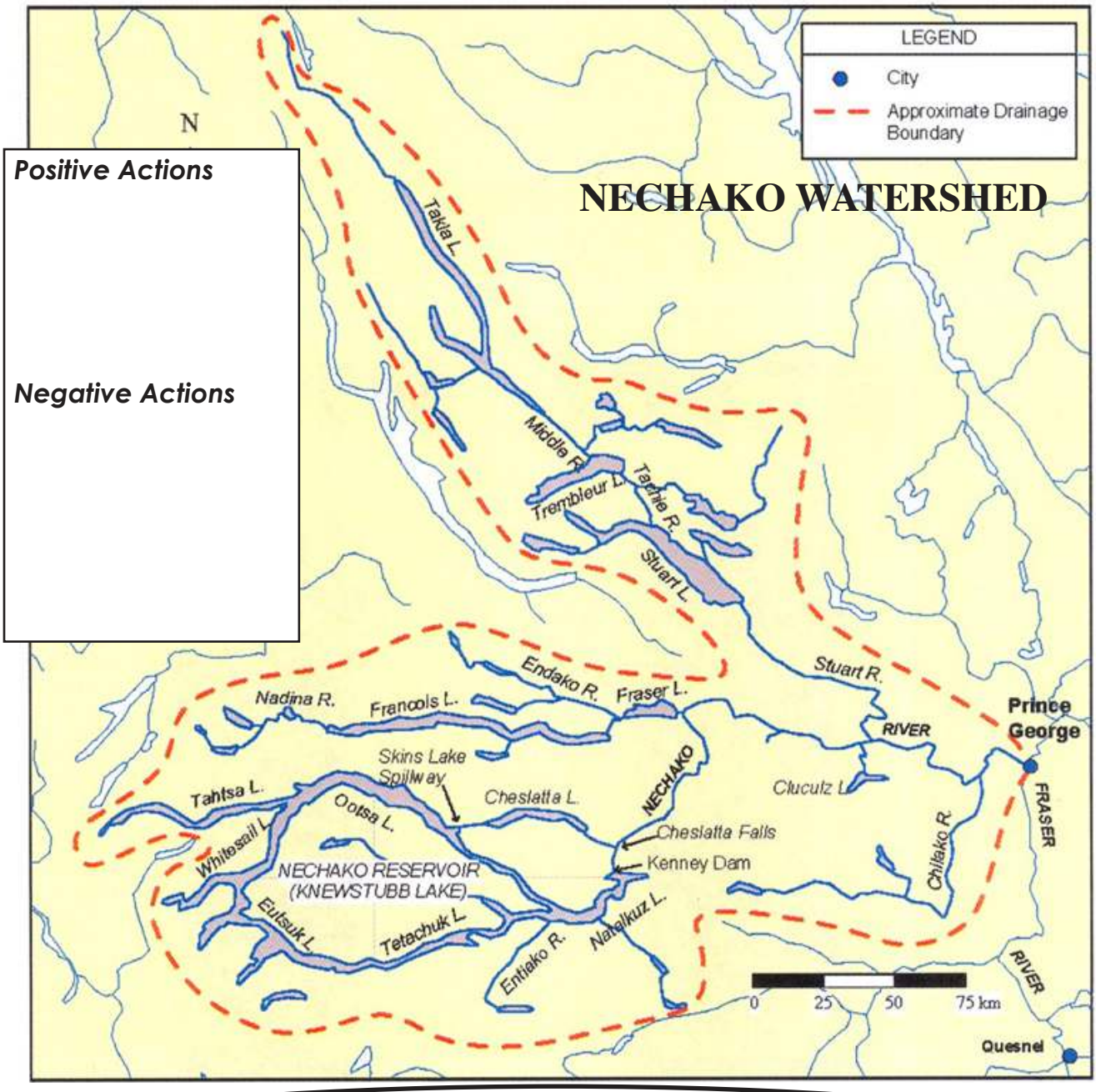
We live within the **Nechako watershed**. The Nechako watershed is made up of over 30 smaller river systems (sub basins). The Nechako River watershed is part of the larger Fraser River watershed. Nechako white sturgeon live within the waters of the Nechako watershed. On the map below, mark the following locations:

- where you are right now
- where you live
- two places you have been camping
- the landfill for your community
- the place you shop for school clothes
- where your parents work

Everything we do on the landscape has an impact on the watershed our water and the animals - eg. Nechako white sturgeon - and humans that live within it. List three positive and three negative actions that occur (by you or others) in the places you marked on the map.

Positive Actions

Negative Actions



GRADE: _____ TEACHER: _____

Feedback Form for Unit 2 - Lesson 2-1

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?