# “Shoreland Health Q&A Teller” lesson plan

Duration: 30-40 minutes

Objectives:

- Students will identify and assess ways freshwater habitat and water quality can be enhanced and protected locally.
- Students will demonstrate an understanding of biodiversity, its contributions to the stability of natural systems, and its benefits to humans.
- Students will assess the impact of human activities on the environment, and analyze ways to mitigate negative impacts and contribute to environmental sustainability.
- Students will demonstrate an understanding of interactions between and among biotic and abiotic components in the environment.

Background:
Planting native trees, shrubs, ground covers, grasses, wildflowers, and aquatic vegetation along shorelines benefits wildlife, enhances climate change resilience, prevents shoreline degradation, and supports natural processes that are essential to a healthy watershed. This activity will help students build confidence and capacity to take local environmental action and make an on-the-ground difference for freshwater issues affecting their community.

Materials:

- One “Shoreland Health Q&A Teller Activity” handout per student
- One writing utensil per student (pencil recommended)
- Colouring utensils (optional)
- Scissors

Procedure:

1. Discuss with students the importance of a natural shoreland in protecting freshwater health. Encourage students independently or as a class to research and explore watersheds.ca and naturaledge.watersheds.ca for information to facilitate discussions.
2. Give each student a “Shoreland Health Q&A Teller Activity” handout. Have students write their answers to each question in the corresponding area and colour if desired.
3. Have students cut out the outer square from the handout and follow the instructions provided at the bottom of the handout to fold their paper shoreland health Q&A teller. Note: Slide your thumbs and index fingers under the squares to move the paper teller.
4. In partners or small groups, students ask their peers to pick a square from the top of the teller. Students then spell out the word while alternating a pinching and pulling motion with the paper teller to reveal a set of four questions. For example, if they pick fish the student would say “F-I-S-H” and work it four times, once for each letter.
5. With the teller still open, students ask their peers to pick a number from the four inner flaps and work the teller back and forth that many times.
6. Then students ask their peers to pick another number from the four inner flaps and read the corresponding question.
7. After working through the question, have the student open the corresponding flap to read the answer and check their knowledge!

Possible Answers:

1. What threats can you identify to your local freshwater?

   Pollution, litter/garbage, invasive species, overexploitation (overdevelopment causing silting or sedimentation), climate change, poor water quality, fertilizer or pesticide use, stormwater runoff, lack of native vegetation, flow modification, wastewater contamination (septic and greywater), hardened/developed shorelines, habitat loss, etc.

2. Why should we leave fallen woody debris in the water and on the shore?

   When safe to do so, leave fallen trees, logs, and branches in the water and on the shoreline to create vital wildlife habitat for terrestrial and aquatic native species. Woody debris and overhanging vegetation provide cover, shade, easy transitions from land to water, food sources like insects, and other crucial habitat features for fish, frogs, turtles, and other wildlife.

3. What is the riparian zone and why is it important?

   The riparian zone is an area between the upland zone and the shoreline known as the “Ribbon of Life.” Riparian zones form the interface between land and water, creating vital habitat for terrestrial and aquatic wildlife. The area includes the first 15 metres of land around a lake or river and supports 70% of land-based wildlife and 90% of aquatic species at some point in their lifetime. Native wildlife like birds, mammals, insects, fish, reptiles, and amphibians depend on this shoreline habitat for food, water, shelter, and breeding.

4. How does the use of fertilizers and pesticides impact freshwater?

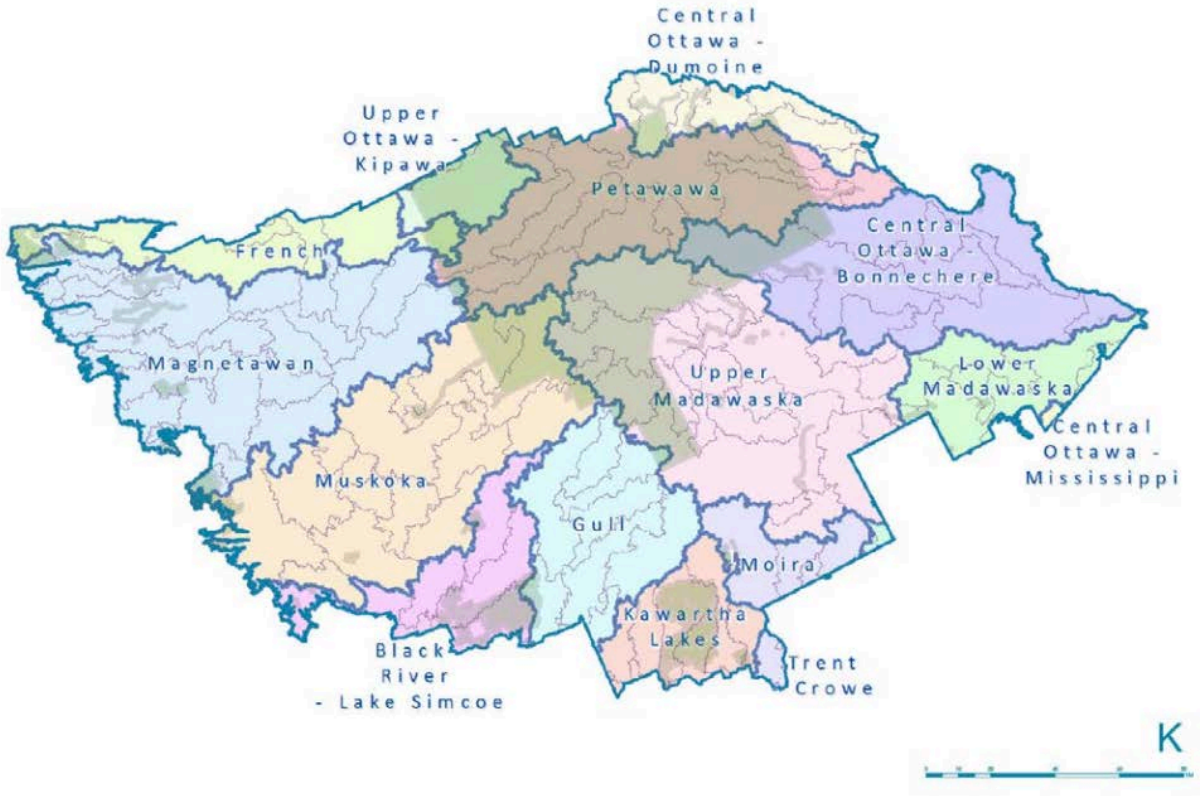
   Surface runoff dissolves and carries pollutants such as fertilizers and pesticides from the land to nearby water bodies, upsetting the natural ecosystem. Runoff containing fertilizers and pesticides carry higher levels of phosphorus and nitrogen to nearby water sources, resulting in nutrient loading which can stimulate algae and plant growth and contribute to algal blooms. Chemical residues in surface water can also harm plants and animals and contaminate groundwater and freshwater drinking supplies.

5. What are the benefits of planting native wildflowers?

   Native wildflowers act as a critical food source and place of habitat attracting birds, pollinators, and small mammals. Native wildflower species require less maintenance, support native wildlife habitats, and are suited to local conditions, including climate, soil types, moisture levels, and sunlight availability.

6. What is a watershed? What watershed is your lake a part of?

   A watershed is an area of land that catches rain and snowmelt and allows it to seep into the ground as groundwater or drain through a network of streams and rivers into larger bodies of water such as lakes and oceans. Watersheds are connected, dynamic, and nested systems. Canada has 25 major watersheds that flow into five ocean watersheds: Arctic, Atlantic, Hudson Bay, Pacific, and Gulf of Mexico. For example, Eastern Ontario’s water flows into the Atlantic Ocean via the Great-Lakes Basin and the St. Lawrence River Watershed.




Map showcasing tertiary watersheds, including the Madawaska to Crow River watersheds.

Image source: "Fisheries Management Zone 15: Background Information" (2019). Government of Ontario, https://prod-environmental-registry.s3.amazonaws.com/2022-07/FMZ-15-Background-Master_June15_2022.pdf

7. What local actions can you take to help protect freshwater?

   Plant native vegetation, plant a pollinator garden, implement stormwater management techniques, create a “no-mowing” zone on your lawn, create a natural shoreline buffer with a variety of native trees and shrubs, avoid the use of fertilizers and pesticides, remove invasive species, enhance wildlife habitat, use water saving strategies, reduce the use of plastics, etc.

8. Why is a native plant buffer important for your shoreline?

   Enhancing or creating a natural shoreline buffer with a variety of native trees, shrubs, grasses, and wildflowers provides long-term flood and erosion protection while also improving habitat diversity and freshwater quality. Native plant buffers create diverse habitats, support healthy ecosystems, and enhance habitat connectivity along shorelines. Planting deep-rooted vegetation, like trees and shrubs, will bind and stabilize the soil to promote long-term shoreline stabilization and climate change resilience. They will also act as natural barriers to reduce surface runoff and silting, slow floodwaters, and filter pollutants and excess nutrients. Native riparian vegetation plays a significant role in stream bank stabilization, water quality protection, temperature moderation, wave attenuation, and woody debris and organic matter input.