



Teacher's Guide



River Safety Quest

The Ausable Bayfield Conservation Authority celebrated 75 years of conservation in 2021. That's 75 years of helping to protect people and their properties from flooding. These program materials have been developed with the support of our twelve member municipalities.

This updated River Safety Quest program helps watershed students (Grades 4 and up) learn how to be safe around rivers and streams. This year, we offer two different formats of the River Safety Quest program so teachers can use what is best for their situation.

Option 1: Book a time with ABCA to present the program synchronously to your class (contact info below). This format is 45 minutes in length.

After the program, we invite your students to complete an 'Escape Room' style challenge. With their new knowledge and puzzle solving skills, the students will be challenged to solve the puzzles based on the program themes to complete the ultimate River Safety Quest.

Option 2: Plan for 15 minutes each day during a week to work in the four themes of the program. This format is 75 minutes over 5 days. To help you through the program materials, the following pages will provide you with a mini lesson plan for each day including sections on Summary of Lesson, Reflection, Activities, Extension and Notes.

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Lesson 1: Decision Making around Water

Lesson 2: Cold Water Safety

Lesson 3: Flooding and Wet Habitats

Lesson 4: Where does the rain go? (Grade 6 and up)

Summary of Lesson: A short summary of background information for the specific lesson

Reflection: Some questions to reflect on about the specific lesson

Activities: Activities have been chosen to be delivered in Classroom or At Home

Extension: Extending the learning on a specific lesson

Notes: section has been included to record any thoughts or comments on the materials covered for that lesson.

Contact Information: Phone: 519 235 2610

Website: www.abca.ca



Lesson 1: DECISION MAKING AROUND WATER



Summary of Lesson:

Today's topic is "Decision Making around Water" and making good choices around water so, you stay safe. Have you ever made a bad decision? Take a moment to think about how that affected you academically, physically or mentally.

Learning to make good decisions around water will help keep yourself safe. Let us start by thinking about where the water is in your community. Do you have a river, creek or pond near your house? Do you live by Lake Huron? In the ABCA watershed, there are two major river systems: the Ausable and the Bayfield Rivers. You may live close to one of these rivers. If you live near Staffa, you live close to where the Ausable River starts. If you live near Seaforth, you live close to where the Bayfield River starts. The place where a river starts is called the headwaters. Whether or not you live close to the headwaters or somewhere downstream, everyone needs to be aware of where the water is in their community.

What is your favourite activity to do in and around water? Rivers are a fun place, but can be very dangerous if the current is too fast and too strong. Did you know that drowning is the second most common deadly accident for children under 14 years of age? No matter what the activity, it is a good idea to have either an adult or a friend with you. Also, take safety equipment with you and have it ready. It only takes a moment to pack a few things like a first aid kit, a snack and a whistle.

The greatest danger in winter is thin ice. The ice on a pond or river may not be completely frozen and someone could fall through. Ice is never 100% safe. Whether walking, sliding or skating, always have an adult check if the ice is thick enough before you play on it and check the thickness in multiple spots. According to the Life Saving Society of Canada, the ice must be at least 10 cm thick for activities like skating. Of course, the ice must be thicker for activities involving vehicles on the ice.

Be aware that ice on Lake Huron can be dangerous too! Shelf ice is a floating layer of ice created by wind and waves. The shelf ice near the shoreline is a jumble of ice chunks pushed onto each other and large mounds of ice can rise up. Sometimes a hole in the ice mound will lead directly to the icy lake waters below. Because of the uneven surfaces and possible air holes throughout the shelf ice, the ice may break unexpectedly. Never walk on shelf ice!

Finally whatever the time of year, being safe means that you have told someone where you are going and when you will return. If you do not return on time, your caregiver knows who to call or where to look for you!

Reflection:

1. What is your plan for being safe for the next time you do your favourite activity?
2. What is one thing you can do to stay safe around rivers in summer?
3. What are your top three items to pack as safety equipment? Why?

Activities: Being Prepared

Materials: none provided but students may have to spend some time researching

Option 1: Have students stuff a backpack with items to keep them safe for going snowshoeing or skating

Option 2: Have the students dress for going snowshoeing or skating

Have the students create a list of their choices and explain them.

Extension:

- Research news stories on drowning or falls into water with respect to Lake Huron or the Ausable or Bayfield Rivers
- Show a video on drowning prevention and peer pressure (recommended for Intermediate/Senior Level) [Drowning Prevention Week 2014 - Filling Up film - YouTube](#) (Royal Life Saving Society UK)
- Show a video on checking ice thickness
[The Science Behind Ice Thickness | IMR - YouTube](#) (Weather Channel - thicknesses are given in Imperial Units)
[How to know if the ice is safe to walk on](#) (Modern Carnivore - thicknesses given in Imperial Units)
[how to check for safe Ice conditions - YouTube](#) (TLE - thicknesses given in Imperial Units)
[How Thick is the Ice - YouTube](#) (Weather Channel - thicknesses given in Imperial Units)

Notes:

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Lesson 2: COLD WATER SAFETY



Summary of Lesson:

Today's topic is "Cold Water Safety" and how cold water can affect the human body. Have you ever fallen into cold water? Take a moment to think about what that would be like.

Cold water can be deadly! Not only do you have the risk of drowning but also the risk of becoming hypothermic. Hypothermia happens when your body temperature cools down. Did you know that water takes heat away from the body faster than air at the same temperature? Most people would not consider swimming in water fifteen degrees Celsius or lower. Burr, that is too cold for me!

The average temperature of the human body is thirty-seven degrees Celsius. While in cold water, the temperature of the human body starts to lower. At thirty-four degrees Celsius, warning signs of mild hypothermia include intense shivering, clumsiness, slurred speech, and an increased heart rate. As the body temperature continues to lower to twenty-eight degrees Celsius, it leads to severe hypothermia. In this stage, a person may not breathe very well and may become unconscious. Unconscious means that the person is not aware of anything around them. At different stages of hypothermia, medical assistance will help that person recover. Still, sometimes people die from hypothermia.

It is important to remember the 1:10:1 Principle when it comes to a fall into cold water. The 1 stands for the 1 minute of 'Cold Shock' a person will experience after falling into cold water. During the first minute, it is important to get your breathing under control and not swallow water. Next, a person will have 10 minutes of 'Meaningful Movement'. During these 10 minutes, it is important to try to get out of the water. After that, a person will have to wait in the cold water for rescuers to arrive. The last 1 stands for 1 hour. Most people will survive at least 1 hour in cold water before they display signs of severe hypothermia.

If you see someone fall into cold water, it is important to get help immediately. Stop! Do not go! Call 911 or find an adult to help! You can also help someone by encouraging the person in the water to get their breathing under control and to get out of the water as much as they can.

Reflection:

1. If you saw someone fall through the ice, what would you do?
2. Have you ever fallen into cold water? If so, what was it like? What did you learn about yourself or others?
3. What is one thing you can do to be safe around water/ice/snow in winter?

Activities: Test how cold water/cold hands affects your body

Materials: lock and key or proper fitting nut and bolt; snow and/or water; deep bowl or container (option 1)

Option 1: Cold water immersion: Take your container or deep bowl and fill with snow; Add water to the container to form a slush; Make sure the lock is locked; Place the lock and key or nut and bolt into the container; Have student put both hands in the cold water; After a short period of time (30 seconds or less), have the student grasp lock and key from in the container and try to put key in lock while hands are still underwater

Option 2: Snowball method (outside): Bring sets of nuts and bolts or locks and keys outside; Have students make a snowball or two without mitts; Have them hold onto the snowball for a short period of time (30 seconds or less); Have the students match nuts to the bolts and keys to the lock (trying to open the lock and/or screw the nut all the way onto the bolt)

Extension:

- Research hypothermia and other effects of cold water on the human body
- Show a video of someone falling into water and getting out
[How To Survive A Fall Through Frozen Ice - YouTube](#) – Tech Insider (Cartoon)
[How to Survive Falling Through Ice - YouTube](#) – ABC (News Story)

Notes:

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Lesson 3: FLOODING and WET HABITATS

Summary of Lesson:

Today's topic is "Flooding and Wet Habitats". Have you ever seen a flooded river? Take a moment to think about what you saw, what you heard and what you felt.

What is flooding? It is "too much water in a new place". When floods occur, there is the risk of property damage, hardship to people, and loss of life. Flooding occurs along all rivers and streams when the water overflows its banks to cover the surrounding land. The floodplain is the land around a river, which is going to flood when the waters are high. Because these areas are not suitable for most types of development, you will often find conservation areas and parks located in floodplains.

The watershed is an area of land that drains or sheds the water to somewhere else. In the case of the ABCA, the water drains or flows to Lake Huron. There are different kinds of wet habitats found in the watershed. Many animals depend on the floodplains for their habitat. Can you think of some animals that live in a floodplain? To survive, these animals need to adapt to changing water levels in the floodplain.

Most of the time you may think about flooding in the spring. However, flooding can happen at any time of year. In fact, in a changing climate, there are many reasons flooding happens. Reasons for flooding include warm days, snowmelt, heavy rain, ice jams and ground conditions. Warm days in the winter and spring can cause snow and ice to melt quickly to cause flooding. Heavy rainstorms can result in rapid rises in water levels that can last for several days. Ice jams occur when large amounts of ice collect or jam together in a river to block the flow of water. Water levels rise and cause flooding because the ice jam is now acting as a dam.

If the ground is dry and it rains on a natural surface of like sand or grass, the water will travel through the air spaces or voids between the soil particles to infiltrate into the ground. However, if the ground conditions are already wet, then the water has nowhere to go and the water in that area will start to puddle. Saturated ground conditions at the start of a rainfall can lead to flooding on land and in rivers.

Watch out for high water! Floodwaters can move very fast and are often cold. Streambanks can be slippery when water levels are high. Stay clear, stay safe!

Reflection:

1. Why does flooding happen?
2. Why is it important not to build houses in a floodplain?
3. Name an animal that lives in a floodplain. Does high water in spring affect that animal? If so, how?

Activity: Wet Habitat Diorama (a 3-D lifelike model representing a marsh, swamp, fen or bog)

Materials: shoebox or other small box; plastic figures; clay; magazines; silk or plastic plants; popsicle sticks; toothpicks; glue; markers; paint; construction paper or other craft or items from recycling bin

Each student will gather their necessary materials to create a diorama showing their selected habitat. The entire shoebox or other small box must be used as the space for the diorama. Students should start by covering the inside of their box using paper (a colour that is suitable to the habitat). As part of the diorama, students should have at least two different types of animals and have at least two different types of plants. Creativity is encouraged!

Extension:

- Research different types wet habitats and the variety of life found within them
- Show a video on wetlands
[Wetland Wonderland - YouTube](#) (Hinterland Who's Who Tube)
[Bill Nye - The Science Guy - S03 - E7 - Wetlands - video Dailymotion](#) (Bill Nye – 23 minutes)

Notes:

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Lesson 4: WHERE DOES THE RAIN GO?

Summary of Lesson:

Today's topic is "Where does the rain go?" and where the water goes when it rains or snow melts. What do you think happens to rain? Take a moment to think about rain and the water cycle.

Water is continually on the move through the water cycle. If it rains on your house or apartment building or school, where does the water go? Houses are built to be water-resistant and not allow water inside the house. Water from the roof travels to the ground through the eaves troughs to downspouts. If the water goes to a natural surface like grass, the water will be absorbed into the ground. If the water goes to a paved surface, the water will continue to flow until it goes down into a storm drain and out to the nearest river or creek. Conservation Tip: To conserve the rainwater, a rain barrel can be set at the bottom of a downspout to collect and store water to use on garden plants later. Looking closer at surfaces around your home or school can tell you where the rainwater will go. Pervious surfaces are mostly natural materials, which allow water to be absorbed into the ground. Impervious surfaces are water-resistant surfaces and are manufactured materials.

A school and its yard will have a variety of surfaces. Some of the surfaces at your school can absorb water (pervious) and some of them cannot (impervious). Pervious surfaces or natural surfaces include grass, gravel, wood chips, forest, meadows, and sand. Water will take different lengths of time to infiltrate the ground depending on the type of pervious surface. Water will not travel through impervious surfaces such as concrete, asphalt (blacktop), brick and rooftops (buildings). The roads, sidewalks and parking lots in your school community are impervious too. These paved areas seal the soil surface and prevent rainwater from infiltrating into the ground. Surfaces that cannot absorb water will direct water to rivers more quickly and cause river levels to rise.

Did you know as little as 15 cm of flowing water can move a small car?
Stay clear! Stay safe! Water over roads is a major hazard during flooding.

Reflection:

1. What are some ways to reduce the amount of water that goes into a storm drain?
2. What types of pervious surfaces do you have on your home or school property?
3. Find a map of your home or school property and look for nearby rivers or ponds. Can you find out the name(s) of the nearby river(s)?

Activity: Pervious Pavement (source: TeachEngineering.org)

Materials: modelling clay; large plastic tub (large enough to fit an aluminum baking pan); paper towels; sponges; cotton balls; plastic cup; permanent marker; water; blue food colouring (optional)

See [link](#) for instructions

[Permeable Pavement Worksheet](#) and [Post-Assessment Worksheet](#)

Extension:

- Show a video on pervious and impervious surfaces
[Pervious vs Impervious Surfaces: Working to Protect Your Neighborhood - YouTube](#) (San Antonio River Authority)
[Green Infrastructure Empower - YouTube](#) (San Antonio River Authority)
[Pervious vs Impervious Cover - YouTube](#) (Austin Texas Gov)
- Show a video on monitoring snow
[Monitoring snowpack depth, density and water equivalent - YouTube](#) (ABCA)

Notes: