

# I AM RIVER

Level : Cycle 2 (grade 3&4)

Time : 1 hour

## Driving Question :

Who is the Saint Lawrence River, and how does this river interact with us and with the other animals living in and along its waters?

## Big Idea :

The Saint Lawrence River is an amazing entity that encompasses many ecosystems, and supports many animals, plants and people. We are a part of this system, and our actions impact this River.

## Curriculum connections :

Earth and space ; Living things ; Systems & interactions ; Material world ; Exploration strategies

## Objectives :

- Get familiar with the Saint Lawrence River, understand how it was formed, its ecozones and their respective flora and fauna.
- Discuss some ways we interact with the River. What the River does for us and what we can do for the River.

## Vocabulary :

Plant and animal names, evolution, adaptation, habitat, steward / stewardship, pollution (various types), ecosystem, habitat.

## Materials :

- *I am River* book
- Ice cubes. cups, rock
- 2 x Plant cuttings, salt, cups
- Whale plushies with sound

## Lesson Procedure

### Introduction

Before the book reading, introduce the concept : we are reading a book about the Saint Lawrence River. Perhaps some of you have seen this River, since it runs through Quebec, which is the province you live in! Ask students what they think might be in this River.

### Book Reading

*This section will be separated by pages. For each two-page spread, read the book and then do the activities described here.*

### Page 1-2 : Hello River

**Action** : Ask students to say hello to the River.

**Questions** :

- Has anyone seen the Saint Lawrence River?
- Has anyone been to the Atlantic Ocean? To the Great Lakes?

**Explain** : The Saint Lawrence River, which runs east from the Great Lakes in the middle of North America (our continent) connecting them to the Atlantic Ocean.

### Page 3-4 : Glacial Melt

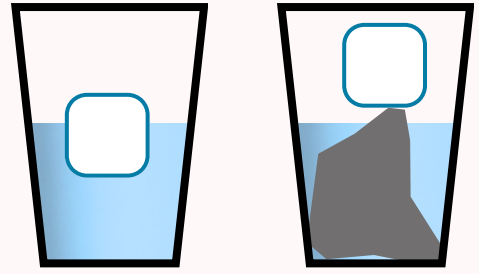
**Action** : Ask students to look closely at the page.

**Questions** :

- Point to the glacier and ask what is this? What is it made of?
- What is an iceberg? How is it different from a glacier?

**Explain** : An iceberg is a mass of ice on the ocean, a glacier is the same but on land. During the last ice age - about 15000 years ago - this area was covered in glaciers. Over time, the world got warm again and about 10000 years ago, the glaciers started melting.

**Experiment** : Have two cups of water, one with a rock in it and one without. Add an icecube to the one without, and then add cold water until there is the same height of water in each. Add an ice cube on top of the rock. (See demo left).



Ask students to make a *hypothesis* - an educated guess - about what will happen to the water level in each cup.

**Explain** : A hypothesis has 3 parts...

1. *If* : You say what the experiment is. “If I do this...”
2. *Then* : You say what you think will happen.
3. *Because* : You say why you think the “then” part will happen.

**Question** : Does anyone want to share their hypothesis?

**Explain** : We will check back on this experiment later. So, when the glaciers melted some 10000 years ago they made a giant puddle over most of Quebec - the Champlain Sea - which, over 2000 years flowed out towards the Atlantic Ocean. As it flowed out, the weight of the water on land lifted.

**Action** : Imagine you are holding a tarp tight on all sides, and it is heavy with pockets of water so it sags a bit in the middle.

**Question** : If you pour out the water, what happens to the tarp?

**Explain** : It bounces back up! So what happened to the land under the Champlain Sea is similar - after the water poured out into the sea, the land slowly sprung back up. This process is called isostatic rebound, and it shaped the Saint Lawrence River.

## Page 5-6 : Great Lakes & Thousand Islands

**Questions** :

- Has anyone been to the great lakes?
- What is the difference between lake water versus ocean?

**Explain** : Lakes have freshwater - that means it is not salty. Oceans have salty water - that’s why if it gets in your eyes, it hurts! The Saint Lawrence River runs from freshwater lakes all the way to the ocean, so it has both salty and freshwater sections.

**Experiment** : Have two cups of water. Add salt to one and stir to dissolve (add a lot of salt for marked effect). Take two plant cuttings (preferably from the same plant). Put one cutting into each cup.

**Explain** : One cup has saltwater, and the other freshwater. Water moves from places where there is a lot of water relative to salt to places where there isn't a lot of water, but there is a lot of salt. Plants are full of water..

**Question** : What do you hypothesize will happen to the leaf in the saltwater versus the leaf in the freshwater?

**Action** : Observe the page.

**Question** : What animals do you see?

**Explain** : Some animals only like salty water and some only like freshwater, so different parts of the River have different animals. Point out the frog.

**Question** : Does anyone know how frogs breathe?

**Explain** : Frogs breathe through their mouths AND skin.

**Question** : Knowing that saltwater in your eyes hurt, do you think it would be a good thing to breathe in? (No) So do you think there would be any frogs in a saltwater habitat? (Probably not!) Different animals are adapted to different environments. Salinity (the amount of salt) is just one factor. We can also think about the temperature, what other living things are in that area, etc.

## Page 6-7 : Estuary

**Explain** : We just talked about how the Saint Lawrence River has freshwater and saltwater sections. The estuary (enunciate) is where they mix!

**Action** : Have everybody mix with their arms (roll arms over each other) and say "estuary" back at you a couple times.

**Explain** : Because the water is mixing, there are a lot of nutrients! This means the estuary has a lot of animals living in it.

**Question** : What animals do you see here?

**Action** : Introduce your friend, Beluga. Have everyone say hi.

**Explain :** Beluga is a kind of whale, and while most of them live in the Arctic, some live here in the Saint Lawrence River!

**Question :** What do you notice about Beluga?

- Small fins, white, small tail, big bump on head

**Explain :** The bump on Beluga's head is called a "melon" and it helps him talk! The melon is a big lump of fat that makes Beluga's voice louder, and helps him make stranger noises than you and I can make.

**Action :** Play the Beluga sounds, and then have students try to make the same noises.

**Explain :** It's hard for us to make those noises, but belugas do it all the time thanks to their melons. In fact, belugas love to make noises, it helps them find each other, find food, make friends, etc. Belugas also echolocate!

**Question :** Does anyone know what echolocation is?

**Explain :** Imagine you are underwater. Opening your eyes, everything is a little blurry, right? And it is hard to figure out how close or far things are from you. Belugas, dolphins and orcas use echolocation to figure out how far they are from their food. They make clicks at a range we can't hear, and those clicks bounce off anything that might be in the water. The sound reverberates through their melon and jaw, and they can locate things that way.

## Page 9-10 : Gulf of the Saint Lawrence

**Explain :** Now we have arrived all the way at the ocean! The water here is salty, and there are different animals than in the freshwater lakes and mixed estuary.

**Action :** Have students look closely and observe what they can see in the water.

**Explain :** The animals here are different from elsewhere in the River, right? These are mostly open-ocean animals - they are adapted to live in an environment that is very salty, very cold, with not a lot of light but a whole lot of space to move around because the water is very deep, and there isn't much land.

**Action** : Introduce your friend, Humpback whale.

**Question** : What do you notice about humpback? How are they different from Beluga? How are they similar?

| BELUGA                                                                                                                                                                                     | HUMPBACK                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eats squid, crustaceans at the seafloor. Sucks up food and crunches it with lots of sharp teeth. Lives in close proximity to lots of other belugas all the time - very social. Echolocate. | Eats krill and small fish on the open water. Gulps food in big mouthfuls and filters out seawater using baleen plates. Sometimes group around food, but mostly solitary. Do not echolocate. |
| Teeth (feeding strategy)                                                                                                                                                                   | Baleen (feeding strategy)                                                                                                                                                                   |
| No throat grooves (no gulp feeding)                                                                                                                                                        | Throat grooves (gulp more water & food)                                                                                                                                                     |
| Melon (for echolocation)                                                                                                                                                                   | No melon (no echolocation)                                                                                                                                                                  |
| Range of sounds (everyone nearby)                                                                                                                                                          | Sings simple, loud (others far away)                                                                                                                                                        |
| Short fins, no dorsal (ice floes, agility)                                                                                                                                                 | Long fins, dorsal (open ocean, migration)                                                                                                                                                   |
| All white (ice floes)                                                                                                                                                                      | Countershading (blend in above & below)                                                                                                                                                     |

**Explain** : These differences are partly from the environment, and partly because Belugas and Humpbacks are simply evolved from different kinds of whales. Broadly speaking, there are two main groups of whales : toothed whales and baleen whales.

**Question** : Can anyone think of another toothed whale (dolphin, killer whale, etc.) or another baleen whale (blue, fin, minke, right)?

**Explain** : Regardless of what type, whales are very very important for the ocean and the whole earth. They regulate food webs, and because they dive and are relatively large, they help move nutrients from the top of the ocean lower down. Also when they die, their bodies feed lots of other ocean animals. They are a vital part of the ocean community.

## Page 11-12 : Montreal

**Question** :

- What is a community?
- Who is in your community?
- Where is this? Do you recognize anything here?

**Explain** : Community is the people, animals and places that you care a lot about, and that care about you.

## Page 13-14 : Gratitude

### **Question :**

- Why might you be thankful towards the River?

**Explain :** Not only does the River benefit animals, it gives us water to drink, to grow our plants and food, to swim in, etc.

**Action :** Have students say “thank you” to the River.

**Explain :** Stewardship - to be grateful actively. To take care.

## Page 15-16 : Damage Done

**Action :** Observe the page closely.

### **Question :**

- What do you see in the water?
- Why might the River not like have garbage in its water?
- Why is the whale sad?

**Explain :** Garbage can get wrapped around wildlife, making it hard for them to swim. Sometimes, they accidentally eat it and get very sick. The whale is sad because the boat is very loud. Remember that whales love to talk and sing. When it is very loud, they can't hear each other! For belugas, who echolocate, sometimes the loud noise can damage their ears and make it very hard for them to feed themselves.

## Page 17-18 : Damage Repair

### **Question :**

- What are the people on this page doing?
- What can you do to help the river?

**Explain :** Putting garbage in the garbage is good, but even better is to make less garbage in the first place! Bring a tupperware instead of a bag, wear hand-me-down clothes, eat less fish and meat, etc. Also, talking about the issue with everyone you know! When we talk about things we show that they are important to us, and we can get others to help too. We can also try to limit what we order online, since it is often shipped in on big, loud boats.

## Page 19-20 : What I have Always Done

**Explain** : By helping the River, they also help all the animals that live within, and they help themselves and their families, since we all rely on this River.

**Action** : Check back on the glacial melt experiment. The water in the cup with rock should be higher now than in the cup with no rock, even though there was the same amount of ice in both.

**Question** : Do you remember which of these was an iceberg and which was a glacier? Do you remember how the St Lawrence was formed?

**Explain** : The glacier was the ice on rock - on land. When glaciers melt, they actually cause the sea level to rise, unlike icebergs. They add water from land into the ocean, whereas with icebergs it's the same amount of water, just in different forms. The St Lawrence was formed via glacial melt, thousands and thousands of years ago. This river has been taking care of people and animals and plants for all that time.

## Page 21-22 : Goodbye River

**Action** : Have students say and wave goodbye to the River.

**Question** : Are you a friend of the River now?

**Action** : Thank the students for listening so well. Ask if they have any questions.

**The End!**

