RIVER SCHOOL PROGRAMS

AT THE FRASER RIVER DISCOVERY CENTRE

River Champions

Grades 3-5

Program Overview:

In recent years, residents of the Fraser River Basin have witnessed several weather records: The village of Lytton reached 49.6°C in June of 2021, and the town of Hope received 252 millimetres of rain within the span of a weekend that November. These records are not just anomalies, they are a result of how climate change is affecting the *frequency* and *magnitude* of extreme weather events. River Champions seeks to introduce how climate change has been affecting flooding events across the Fraser River Basin. Increasing rainfall, decreasing snowpacks, and rising sea levels in coastal areas pose risks to communities who inhabit spaces close to the Fraser River. Students will participate in two different activities to explore how to design a sustainable floodplain that can adapt to extreme flooding events.

During the program, students will use a stream table to model flood barriers and design their own floodplain map. The program will end with a debrief to discuss what was learned and connect to real-life examples of flood management practices and research taking place along the Fraser.

Program Objectives

- To understand why humans choose to settle along a floodplain
- To understand how a river can change shape over time through erosion and deposition processes
- To explore different ways in which a river can be managed to adapt to more frequent and larger flooding events

Pre-Visit Activities:

Here are some short activities to help prepare your class for the program.

Central Question: *What can cause a flood?*

1. A flood is defined as when water reaches over the bounds of a channel. But what are some of the causes of flooding events?
2. Using the attached graphic organizer below, have students draw and/or write down four different predictions for potential causes of flooding.
    a. A prediction is a guess about what could cause a future event, written as a statement, such as "I predict… can cause a flood." When we make a prediction, we are also using our past knowledge or experiences

to help guide us. For example, since we know that snow from the mountains will melt when the temperatures rise in the spring and the summer, we can make a prediction that melting snow may cause a flood.

3. Go over the second page of the graphic organizer with the students.
4. Show the students this video from the YouTube channel Learning Junction (up until 1:50) describing what can cause a flood: https://www.youtube.com/watch?v=udRNUBHbE0o&t=28s
    a. Have students use the second page of the graphic organizer to record notes from the video.
5. After the video, discuss as a class about what each student learned, in case a student missed some information
6. Have each student write down something that they learned, and something that they want to learn more about.

Central Question: *Why do humans settle on a floodplain?*

1. A floodplain is an area that has been eroded over time by frequent flooding. But despite the risks of floods, why do humans frequently settle on a floodplain?
2. Using the attached graphic organizer below, have your students draw and/or write down four different predictions as to why humans would choose to live close to a river.
3. Go over the second page of the graphic organizer with the students.
4. Show your class this video from Darron Gredge's Geography Channel (up until 1:25) describing the use of floodplains: https://www.youtube.com/watch?v=70hQbRp_OSA
    a. Have students use the second page of the graphic organizer to record notes from the video.
5. After the video, discuss as a class about what they heard.
6. Have each student write down something that they learned, and something that they want to learn more about.

Background Information on the Fraser River:

In many Indigenous languages, the Fraser River was so important, it didn't need a name. It was simply called the river or "the great river".

In English, the Fraser River was named after Simon Fraser (1776-1862) who explored the river in 1808 on behalf of the North West Company in search of a navigable route for fur trading. Simon Fraser believed that he was traveling on the Columbia River to its ocean outlet.

First Nations people had lived along the Fraser River for thousands of years before Simon Fraser's arrival. Some of the archaeologists estimate up to 9000 years before. (A site under the Alex Fraser Bridge has been dated back that far).

The Fraser River starts as a trickle at Mount Robson (Headwaters) and ends in the Salish Sea in the Pacific Ocean. There are many tributaries that add water to the Fraser, including the Thompson River (22% of the total water flow).

The Fraser River is 1,375 kilometers long. If it was stretched out across Canada, it would span the distance between Vancouver and Regina, Saskatchewan. The Fraser River is the fifth largest river in Canada. It is less than 15,000 years old.

The characteristics and landscapes of the Fraser River change from the beginning of its journey to its end. As you exit the headwaters and enter the Upper Basin region, the river's sediment load increases, creating more turbulent waters with the water appearing grey or brown in colour. The river then passes through the drylands with low vegetation because of little rainfall and hot temperatures. In the canyon, the river is squeezed between the Coast and the Cascade Mountain ranges increasing speed and creating many impressive rapids.

The point at which the fresh water of the Fraser River meets the salty water of the Pacific Ocean is called the estuary, (also sometimes called "between land" by First Nations people because as the tides ebb and flow, the estuary changes from land that is covered with water to dry land).

The Fraser River estuary is as rich in its biodiversity as it is an ideal habitat for many organisms. A habitat can be defined as a place where an organism can get food, water and shelter. The major habitat types along the Fraser River include: brackish and freshwater marshes, salt marshes, tidal flats, sloughs, and flood-plain forests among others.

The Fraser River watershed is also home to 60% of BC's population, approximately 2.7 million people. A watershed is an area of land that drains all the water into one main river. The Fraser River watershed is also called a drainage basin, since it collects so much water and drains such a large area (25% of BC's area).

Helpful Vocabulary

Dike: an embankment for controlling or holding back the waters of the sea or a river.

Setback dike: a dike that is built further back from the riverbank or shoreline, allowing for floodwaters to spill into undeveloped land.

Rip-rap: an artificial structure made from angular stones or boulders that are used to protect against slope erosion on river banks and coastal shorelines.

Wetland: a low-lying area that is permanently inundated with water and able support aquatic plants and various wildlife.

Floodgate: gates used for the controlled flow of water between two different water bodies, able to prevent flooding on either side.

Wet-proofing: a flood-proofing method that allows for floodwaters to either pass through or enter the bottom portion of the structure, preventing damage to its greater extent.

Dry-proofing: a flood-proofing method that prevents floodwaters from entering a structure by installing watertight seals or gates.

Habitat: the natural home or environment of an animal, plant, or other organism.

Freshet: the addition of water to a river channel deriving from the spring thaw of ice and snow, causing flooding events.

Cutbank: the outside bend of a river that is formed through erosion.

Point bar: the inside bend of a river that is formed through deposition.

Meander: the sinuous curves of a river that are formed through erosion and deposition processes.

Watershed: an area or ridge of land that separates waters flowing to different rivers, basins, or seas.

Name: _____ Date:___/___/___

What Can Cause A Flood?

① I predict_____ can cause a flood. A drawing of my prediction	② I predict_____ can cause a flood. A drawing of my prediction
③ I predict_____ can cause a flood. A drawing of my prediction	④ I predict_____ can cause a flood A drawing of my prediction

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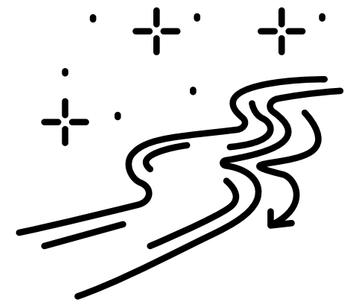
Name: _____ Date:___/___/___

Why Do We Live On Floodplains?



1 I predict humans settle on a floodplain because

_____

_____.

A drawing of my prediction

2 I predict humans settle on a floodplain because

_____

_____

A drawing of my prediction

3 I predict humans settle on a floodplain because

_____

_____.

A drawing of my prediction

4 I predict humans settle on a floodplain because

_____

_____.

A drawing of my prediction

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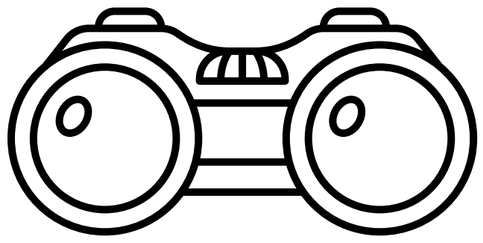
Name: _____ Date:___/___/___

My Observations



We observed that humans settle on a floodplain because there is access to:

What is something I learned?

What is something I want to learn more about?

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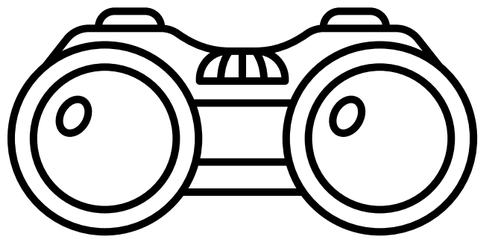
Name: _____ Date:___/___/___

My Observations



We observed that flooding is caused by:

What is something I learned?	What is something I want to learn more about?

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