

FLOODS!



Flooding is the nation's most common, costly and deadly natural hazard. It is also a natural part of river processes. Floods occur when the river levels rise and the water overflows the banks. This happens during or after heavy rains, when snow melts too quickly, or when dams break. This creates a dangerous situation for anyone living near the river. Today, you will take to role of a civil engineer. Your job is to design and supervise the construction of roads, dams, bridges and systems for water supply. You are part of a team who will design a new flood protection system for your town.

Part I. River Shapes!

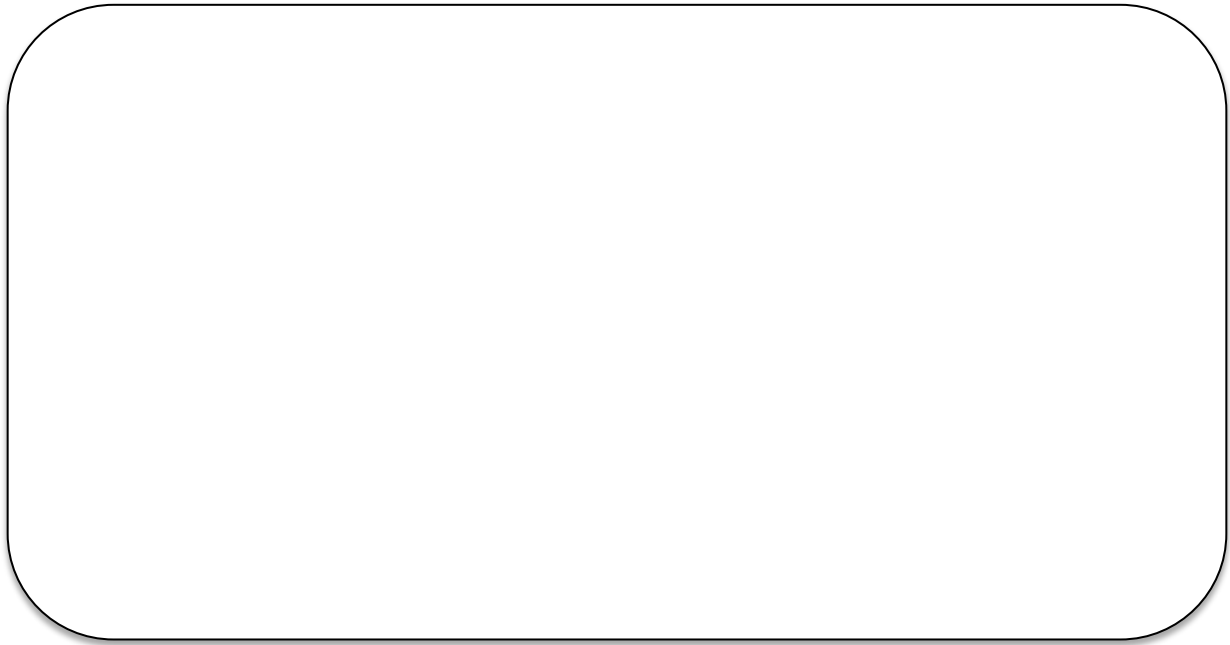
You will be given a small container with sediment in the bottom to test different river shapes. Your town will consist of small shapes that you can place near the river.

- Choose the shape of your first river from the 4 images provided. These are typical river shapes found around the world and are marked A, B, C, D.
- Form your river in the sediment from one end of the container to the other with a wood craft stick so that the river is about 1" wide.
- Place your town near the river bank.

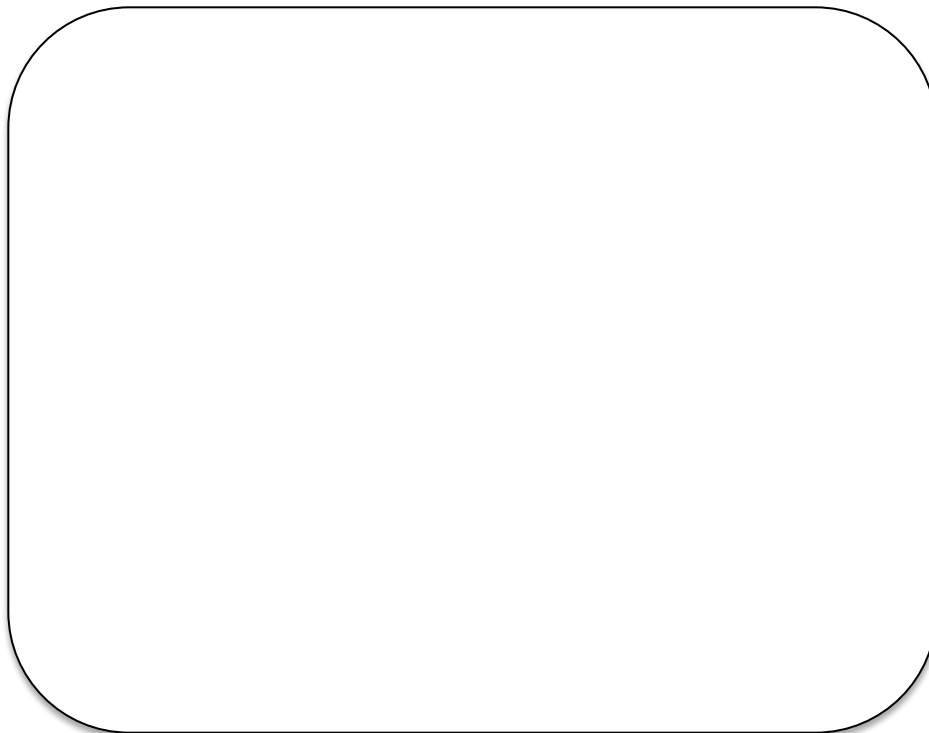
Prop up one end of your container on a wooden block of about 1". You will simulate rain at the higher end of your container with droppers. Discuss with your group how you will produce light and heavy rain. You can help see how fast the water is flowing with little plastic beads dropped in the river near where the "rain" is falling.

As you test the river, make observations about the water flow, the river bank changes, and the impact to the town's building and record them in Table 1. Do this test again with a different river shape.

Describe the procedure that you will use to test the river shape with different amounts of rainfall.



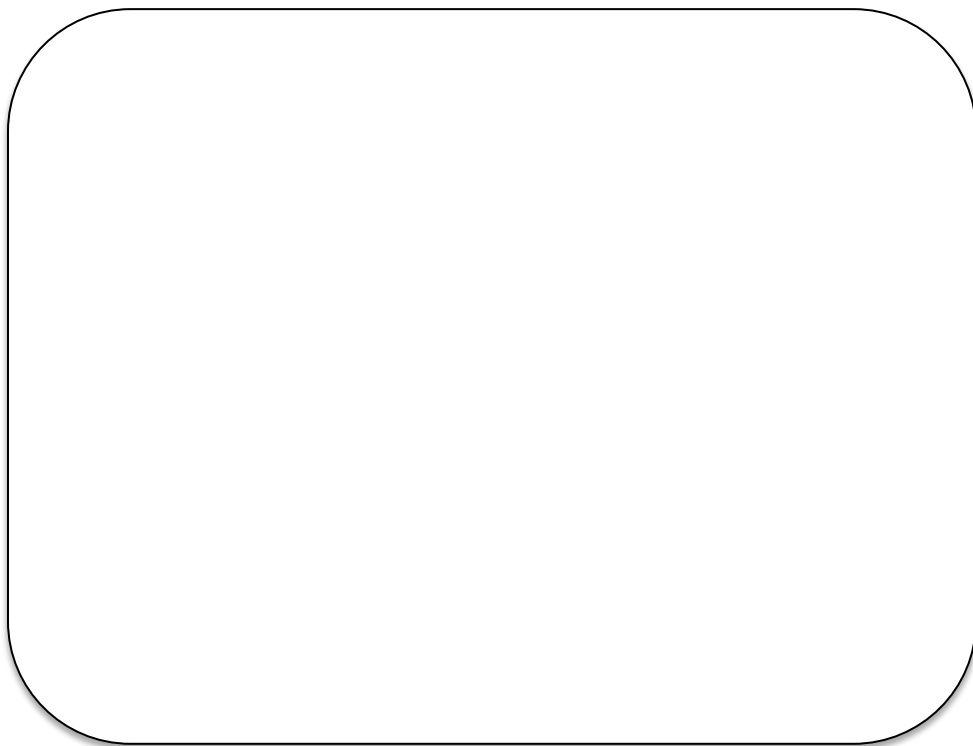
Map of the River and Town Before Rain
River Shape _____



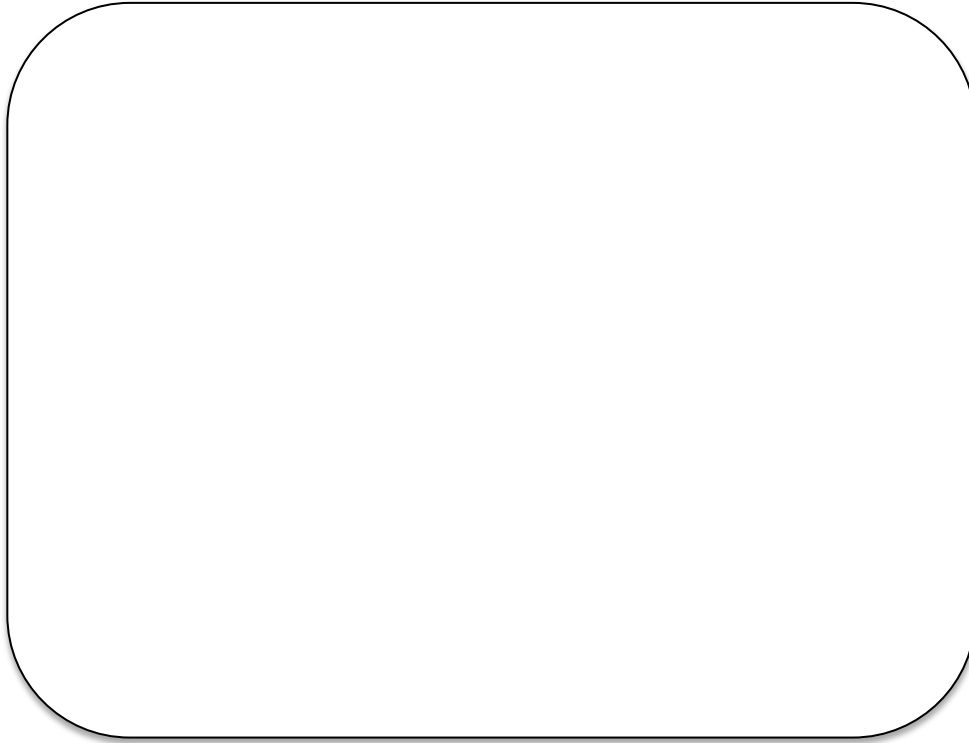
River Shape	Water Flow Observations	River Bank Changes	Impacts to your town

Map of the River and Town After Rain

River Shape _____

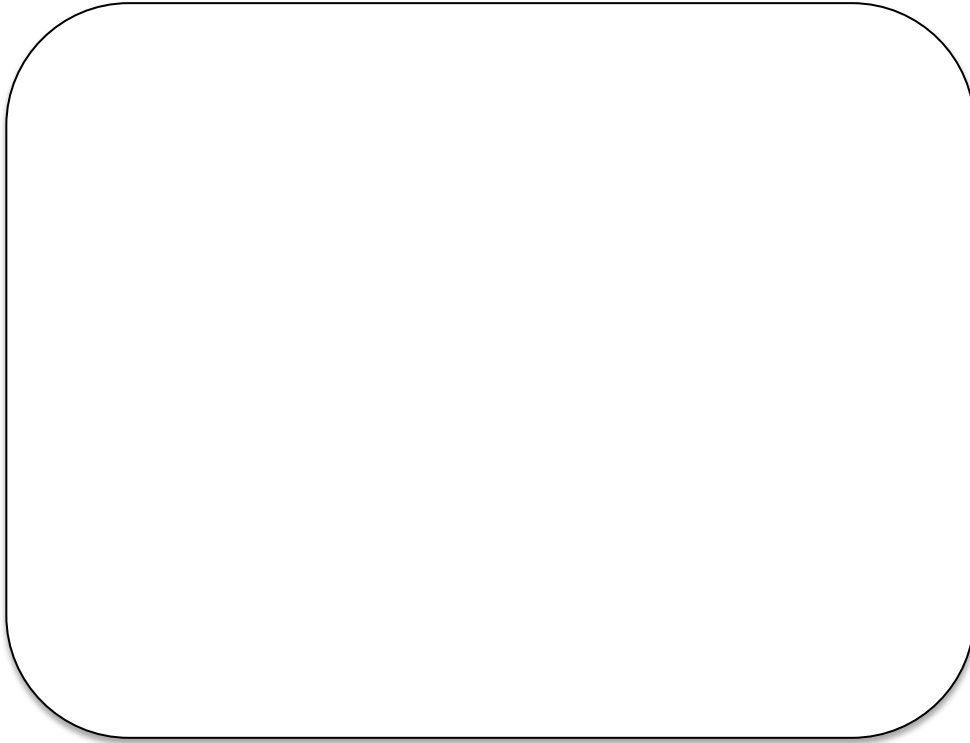


Map of the River and Town Before Rain
River Shape _____



River Shape	Water Flow Observations	River Bank Changes	Impacts to your town

Map of the River and Town After Rain
River Shape _____



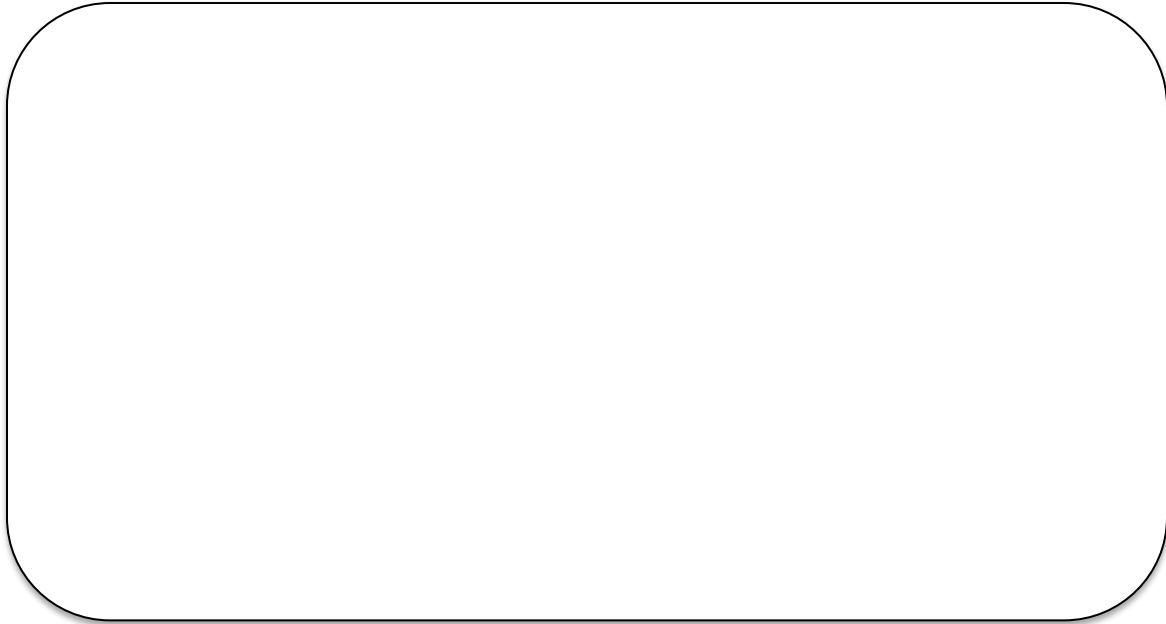
Part 2. Slow the Flow!

Now you will test different ideas to slow the flow of the river. Your teacher will show you some materials that you can use to slow down the river and help protect your town from floods. Work with your team to test at least 4 different ideas. Write down your observations below.

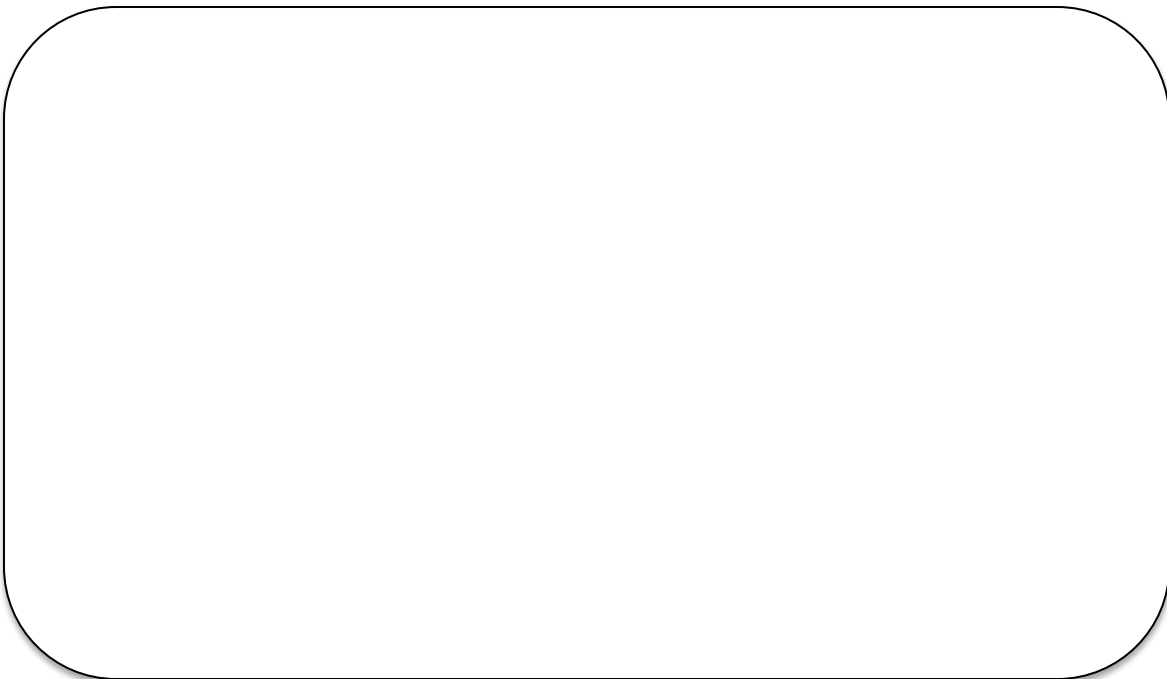
Idea	Water Flow Observations	River Bank Changes	Impacts to your town

Part 3. River Plan

Using evidence from your testing, explain what methods you will use to help protect the town from flooding.



Draw a diagram of your river, the town, and the methods you have chosen to protect the town from flooding.



Part 4. Flood Danger!



Flood stage is the height of the water at which the stream flows over the riverbank and begins to flow into the surrounding area. Keeping an eye on the river level and knowing your flood number will make you flood wise.

A flash flood is the fastest moving type of flood. They are most often caused by heavy rain that quickly collects in a stream or ditch.

Visit the National Weather Service at <http://water.weather.gov/ahps/> and zoom into the map by clicking the + button. Find a stream gauge that is in a stream or river near you and click on the dot. The different colors indicate what the water level is at that point of the stream.

What is the flood level at that stream gauge? _____

What is the level there now? _____

Is it in danger of flooding soon? _____

Flood Safety: Flooding may be only a few inches of water or it may cover a house to its roof. Even the smallest of floods can be dangerous if you are not prepared. It only takes six inches of fast-moving flood water to knock over an adult. Most cars will float and be swept away 18-24 inches of moving water. Trucks and SUVs are not much better with only 12 more inches of clearance.

Turn around and don't travel through flood waters!