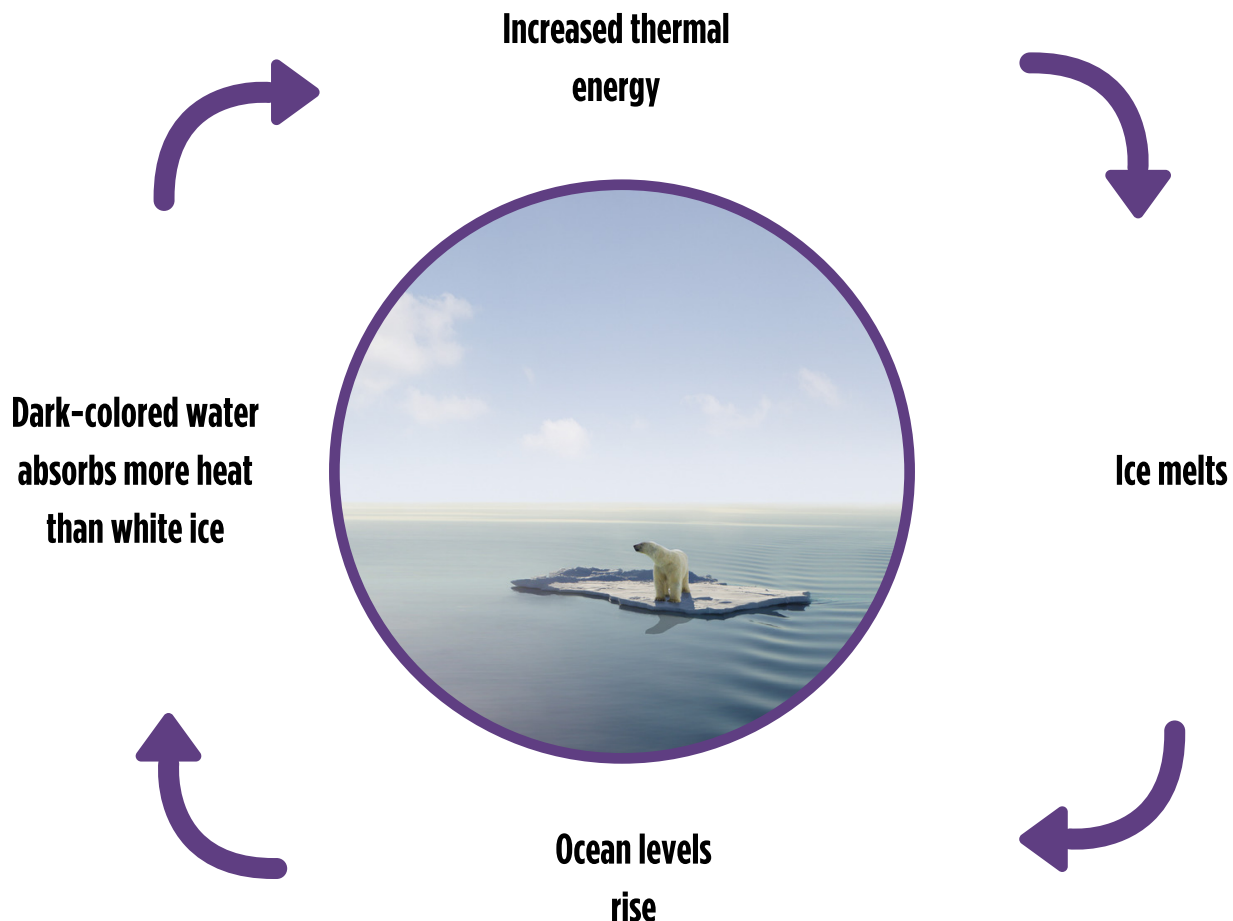


# Why More Flooding Will Occur

**Flooding will get worse as the temperature on Earth increases. Here is why:**

- As the Earth gets hotter there is more thermal energy on Earth's surface.
- Higher thermal energy makes the particles in glaciers (large pieces of ice) move faster and increase in temperature.
- When there is enough thermal energy, the ice melts, turning into water.
- Water flows into oceans.
- As ocean levels rise, there is more flooding along the coast during storms.
- Since ice is reflective, sunlight bounces off it. But because large pieces of ice are melting, less sunlight is reflected off of Earth's surface and more thermal energy from the sun is being absorbed by Earth's dark oceans.
- As more thermal energy is absorbed, Earth gets hotter.



# Examples of Flood Walls

### Automatic Flood Wall

These flood walls are made of metal. When there is no water, the wall stays hidden in the second floor of the building. When a flood is coming, the wall can be lowered to keep flood water from getting inside. The walls can be controlled by pressing a button or special sensors that detect when flood water is coming.



### Snap-Together Flood Wall

This flood wall can be set up when people know a flood is coming. It's made of pieces of strong plastic that snap into each other to build a long wall. After the flood is over, people take them apart, and they are ready for the next flood.



### Individual Flood Panels

Some people use individual flood panels made of strong metal to keep water from coming in through their doors. They put these up when they know a flood is coming and take them down when there is no danger of water coming into their building.



### Individual Flood Door

These strong, waterproof metal doors stay attached to a door opening all of the time. If there is going to be a flood, people just make sure the flood door is closed all the way and it stops water from coming into the building.



# Steps to Build Wall

Follow the steps below to build your own flood wall.

## Step 1: Choose a Location

Flooding near the ocean typically happens during hurricane season, so people have an idea of when they might need their flood walls. But as the ocean levels get higher, it is more likely that flooding can happen at any time. Keep this in mind as you choose one location that you would want to build a flood wall in.

### Technology store

Things to consider when building a flood wall near a technology store:

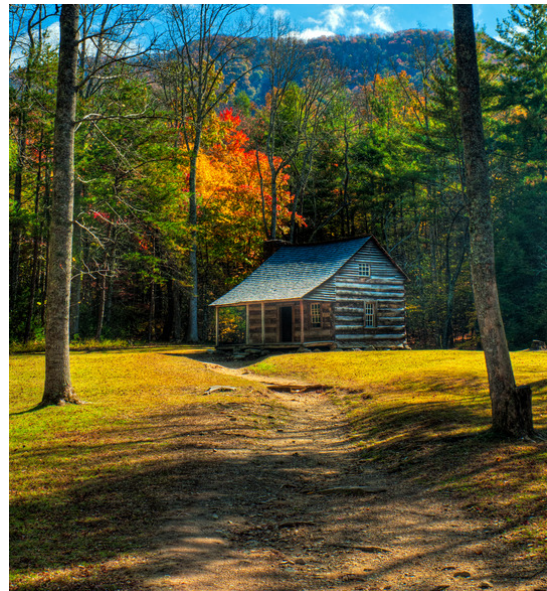
- There are large glass windows at the front of the store. The windows are over 10 feet long. The windows are waterproof, but they are not strong enough to stop flood water.
- The technology store is located in a busy shopping mall. All of the stores are close together, so there is not a lot of room for storage.
- People need to get in and out of the store! When a flood is coming, some people still want to get out of the store and get home to protect their own homes. The flood wall can't go up until right before the flood reaches the store and it has to come back down as soon as possible after the water is gone.
- The people who work in the store are very good at using technology.



## House near the beach

Things to consider when building a flood wall near this house:

- The home is 100 years old.
- The building is made of wood that is very old. The wood is strong, but there are many small openings in the wood where water can get through.
- The house is far enough away from the ocean that there is plenty of warning when flood waters are coming.
- There are plenty of wooded areas nearby for storage.
- There is always somebody at the house to put the flood wall in place. There is also a garage to store a wall.
- Flash flooding frequently occurs. This means that flooding begins within a few hours of heavy rain.



## Soccer field

Things to consider when building a flood wall near a soccer field:

- The soccer field is located next to an ocean. If salty ocean water floods the field, the grass will be ruined and kids won't be able to play soccer.
- The soccer field is 350 feet long. The entire soccer field needs to be protected from flood waters.
- Soccer players walk to and from the field, so you have to be careful where you store the wall.
- The soccer field is on a small hill near a beach. When flood waters come, they flood the beach first before they get high enough to reach the soccer field. If sensors are placed on the beach, they will detect flood waters before the water reaches the soccer field.
- If there is a flood at night, there is nobody at the soccer field to put the flood wall in place.





# Lesson: Building a Strong Structure

## Step 2: Understand Requirements

Read the following requirements before you build your wall.

### Design Requirements:

- Wall can be moved when there isn't a flood.
- Decide whether the wall will be moved manually or automatically and describe how it will work.
- Make sure your wall fits into the location where it will be built. Think about if there is room nearby to store the wall or if it needs to be hidden in the building or below ground when it isn't being used. If you can't find a way to hide it, think about decorating it to blend in with the surroundings.
- Decide how quickly your wall can be put in place. Are there a lot of pieces that need to be moved and put together by a lot of people or just a lever to pull? How much time will people need so they can protect their property?

### Building Requirements:

- Built using water-proof materials. (You will test whether your wall can block water, so it is important that your wall be built using water-proof materials.)
- Wall should be sturdy and strong so that when it is pushed on it doesn't fall apart or fall down.
- Built so that it works in the location that you chose.

## Step 3: Brainstorm Ideas

Discuss with your group how to design the wall and what materials you will use. Questions to think about:

- Is your material waterproof?
- Is your wall strong?
- How will your wall move into place when it is needed?
- How will your wall move when it is not needed?

## Step 4: Build a Prototype

Use art and building supplies to build your wall. Because you will be testing your wall in the next step, you should use water-proof materials. If you want to use a material that is not water-proof (like cardboard), you can wrap it in tinfoil or plastic wrap.