WATER WARRIORS

JASON Learning

Floods can be devastating. They can put lives in jeopardy, destroy property, and displace people. However, we are not powerless against floods. We can apply ideas from science, technology, engineering, and math (STEM) to solve problems related to flooding. Scientists can monitor the strength and trajectory of major storms to warn the people in their paths. Engineers can design buildings and even cities to help prevent major flood damage. We can use technology to coordinate relief and rescue efforts after a major storm.

Scientists and engineers are always working to design better solutions for areas that are in danger of flooding. These are complex problems, and they require complex thinking. Design thinking is a powerful way to develop solutions to complex problems. It starts with defining the problem and understanding how that problem affects people. Then it requires brainstorming many, many ideas and designing and testing prototypes of those ideas. In this type of design, failure is just part of the process. There is room for improvement in every design.

There is much we can already do to help lessen the effects of major storms. But there is also much more we could do. And that is where you come in. By applying your understanding of STEM skills and knowledge and by using design thinking, you can come up with new and innovative solutions to the many problems caused by storms and flooding. You might be part of a team that develops new ideas for building houses that can better withstand flooding. You might help improve our ability to predict storm surges. You might design new ways to evacuate large groups of people to safety during flooding.

Imagine - just a hundred years ago, we didn't even know it was possible to predict when a major storm would strike. What solutions will you design that will help to save lives and protect property during major storms in ways that we can't yet imagine?

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THE WATER WARRIORS DESIGN THINKING BADGE

*To earn the **Water Warriors Design Thinking Badge** you must design and test a flood barrier that could help fight floods in your community, and then submit a description of how your prototype might work, together with photographs or a short (maximum 1 minute) video.*

YOUR CHALLENGE

*Your **Day of Design Water Warriors Challenge** is to design a solution that will protect a small house from flooding.*

PART 1. IMAGINE A SOLUTION

STEP 1. Imagine an "Ideal" Solution

Talk to your team. What do you think the "perfect" solution is to protect a small house from flooding?

Sketch your idea here:

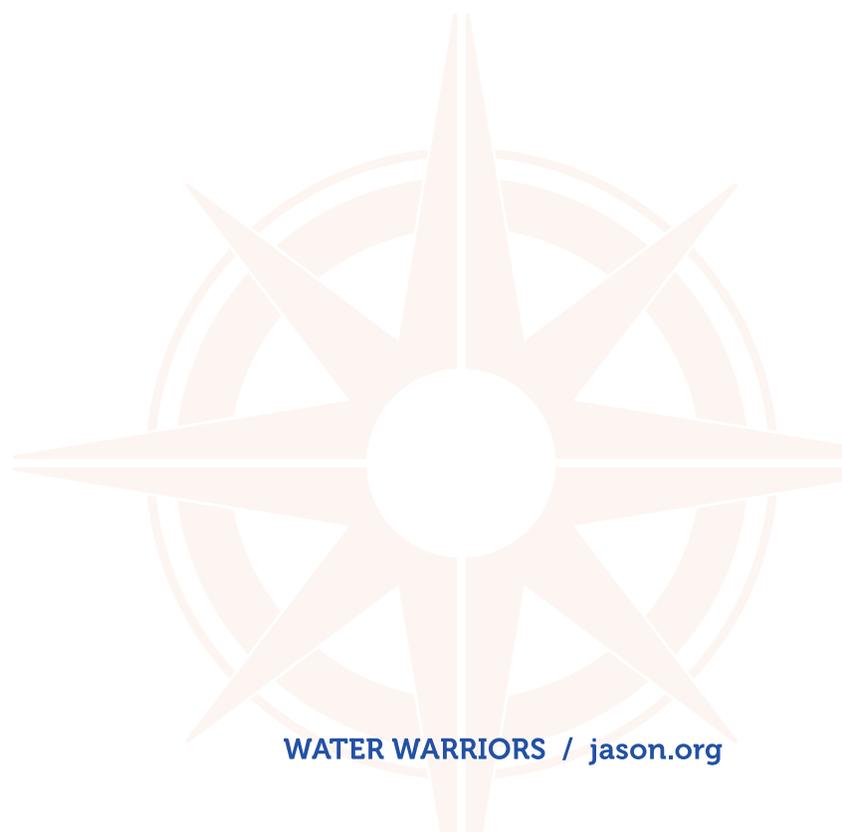### STEP 2. Dig Into The Problem

Now do your research on the problem of flooding. Go online, or if possible, interview someone who owns a small house, or who is responsible to manage flooding in your community. These are your "users".

What do they currently do for flood protection?

Capture what you learn here:

Why does this work or why does it not work?
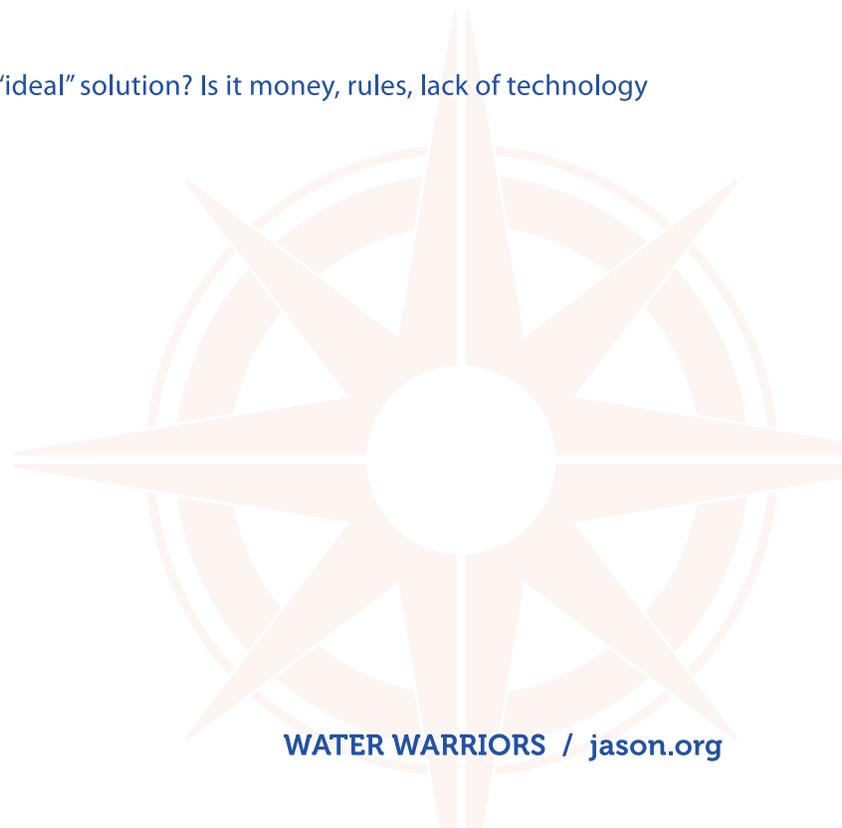
Capture what you learn here:

What does their "ideal" solution for flood protection look like?

Sketch it here:

What is stopping them from making or using their "ideal" solution? Is it money, rules, lack of technology or materials?

Capture what you learn here:

What were the key findings from your research?

Capture what you learn here:

What features of your "ideal" solution do you think will work and which won't? Why?

Capture what you think here:

STEP 3. Create Alternatives to Test

Imagine at least 3 different ways to meet your "users" needs. Make sure that each is as different as possible from the next.

Sketch your 3 or more ideas here:
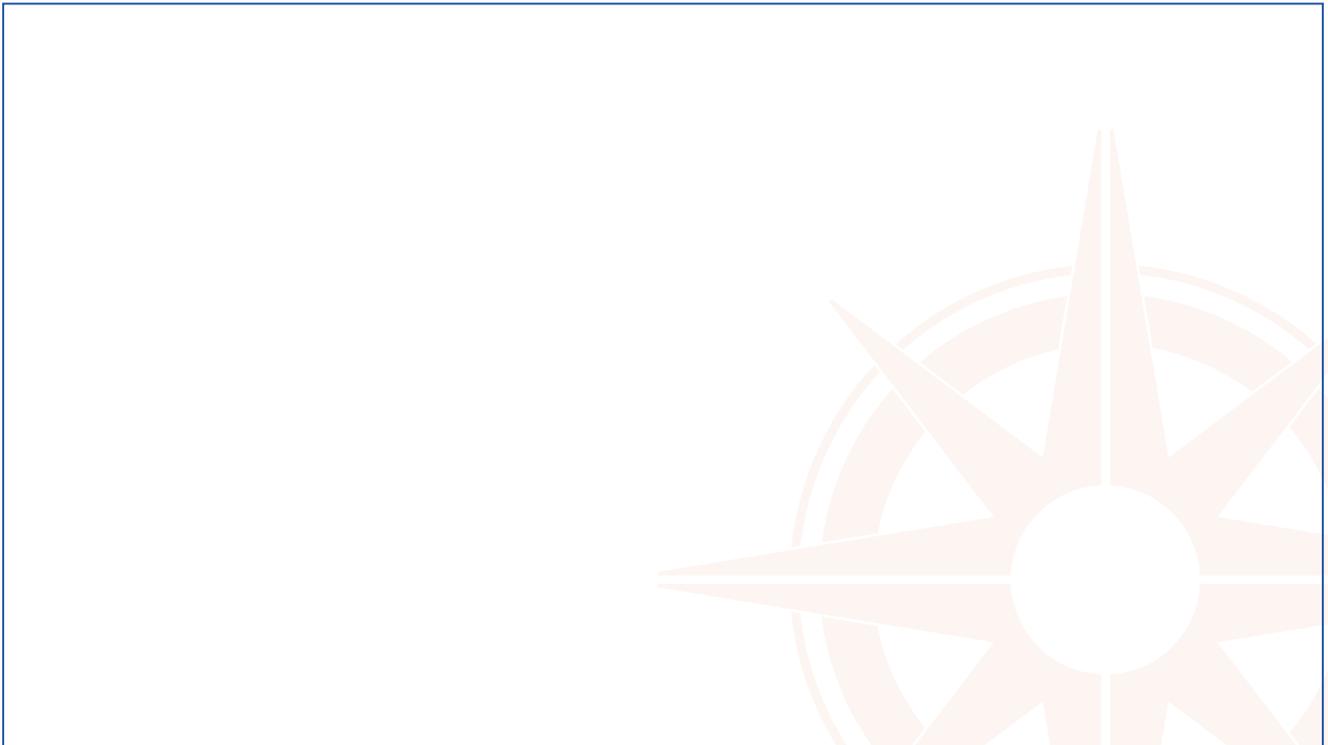
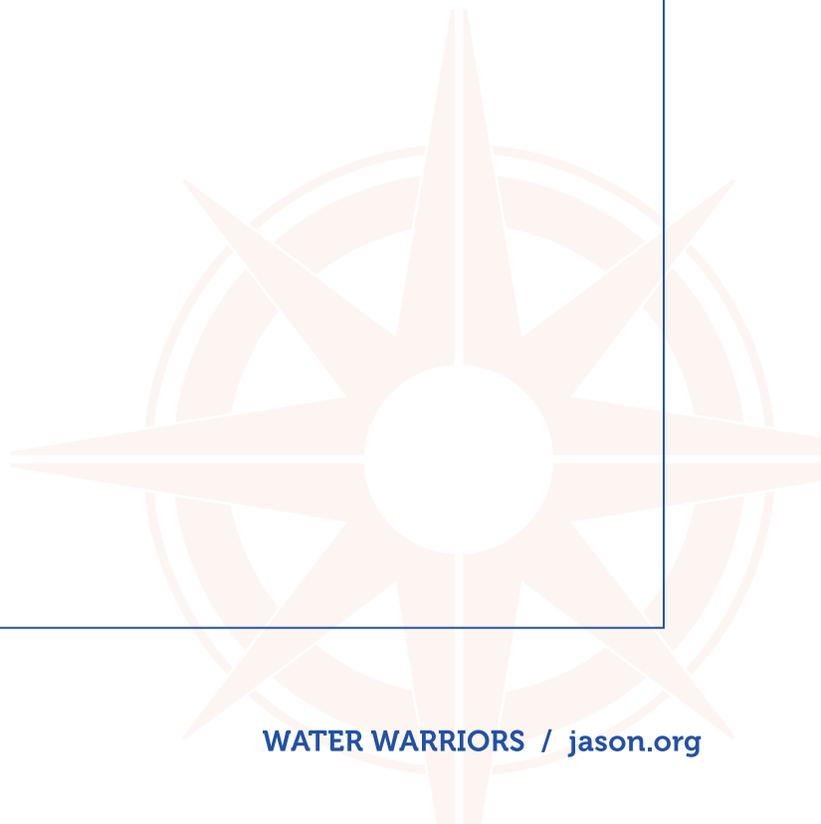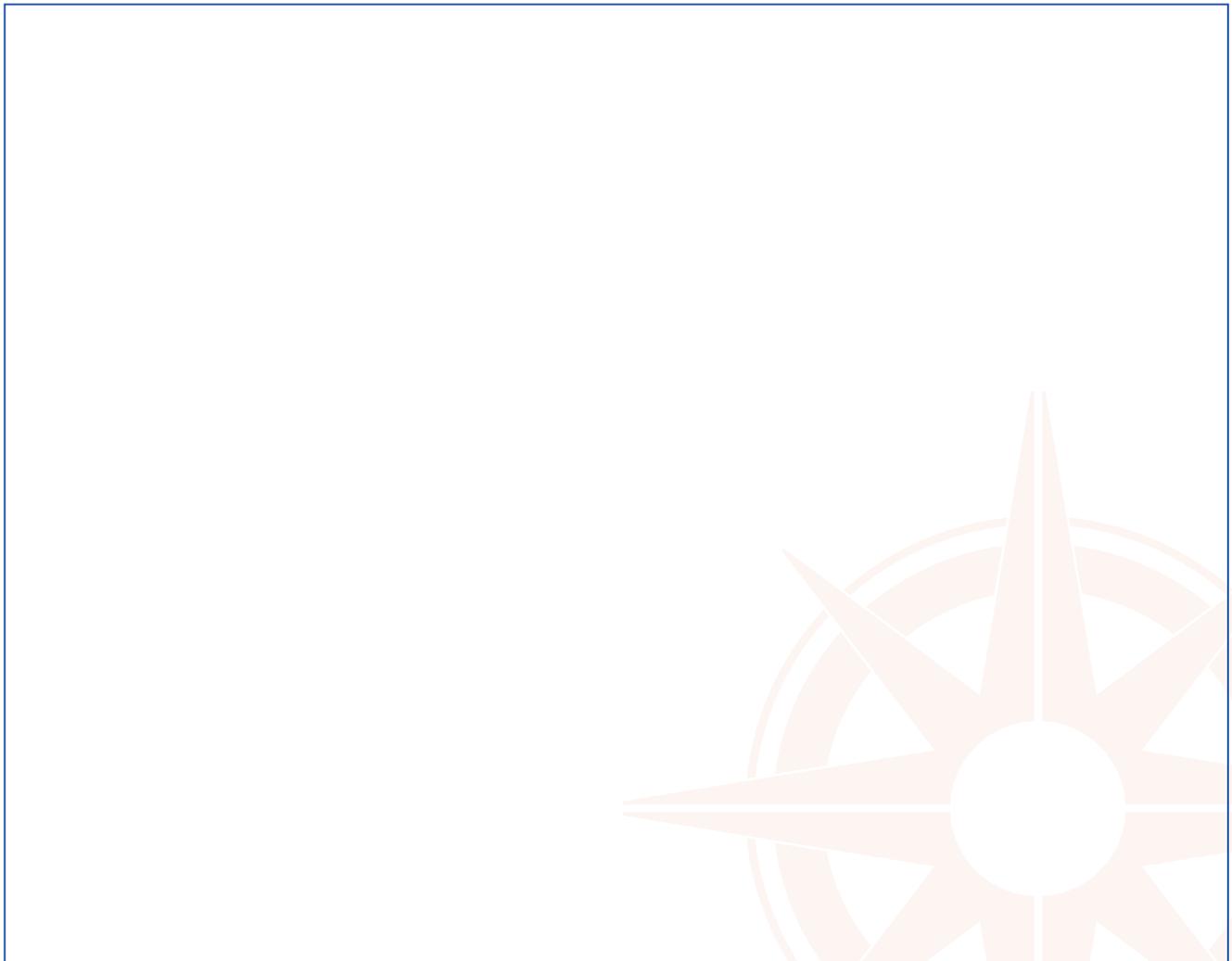Ask your "users" or other teams in your classroom what they think of your ideas.

Capture what you learn here:

PART 2. PROTOTYPE YOUR SOLUTION

STEP 1. Reimagine Your "Ideal" Solution

Based on all the insights you have gained, what do you NOW think a workable solution is to protect a small house from flooding?

Sketch your idea here:

STEP 2. Create a Prototype

Using the resources available to you, create a prototype of your solution. It might not match your ideas completely. But it should help bring your ideas to life for your users, and allow you to start testing them.

Describe how you will create your prototype here:

STEP 3. Test Your Prototype

Using the resources available to you, test your prototype. If possible, ask your "users" what they think.

Describe how you will test your prototype here:

Capture what you learn here:

STEP 4. (OPTIONAL). Refine Your Prototype

If you have the time and the resources, use what you have learned by testing your prototype and improve your solution. You can do this once, twice, or as many times as possible.

PART 3. SHARE YOUR SOLUTION

STEP 1. Reimagine Your "Ideal" Solution

Now it's time to tell your users and your community about your solution. Using the resources available to you, create a digital presentation (with pictures if possible) or a short (1-minute video) that describes your solution, how it works, and anything you have learned about it. Don't be afraid to share ideas or designs that didn't work. These are important because they tell you what the tough challenges are and help you make better solutions for the future

*Ask your teacher to upload your presentation / video to the **Day of Design** so that you can get your **Water Warriors Design Thinking BADGE.***