

“In the Water”

Module 13, Adventure 1

The logo for "EXPLORE IT" is enclosed in a black rectangular border. The word "EXPLORE" is in a bold, sans-serif font, with the letter "O" highlighted in green and the letter "R" highlighted in purple. The word "IT" is in a smaller, simpler font to the right.

Prompt:

Starting with just a piece of aluminum foil, design a boat that can carry many passengers safely.

Materials:

- 1 Large bowl, plastic bin, or bathtub
- 30+ Small weights: pennies, washers ($\frac{3}{4}$ " or $\frac{5}{8}$ "), or small rocks - **whichever you choose, they all need to be the same!**
- Aluminum foil
- Explorer Notebook or a piece of paper
- Pencil or pen
- Ruler or measuring tape
- Scissors
- Additional boat materials, such as plastic containers, craft sticks, plastic bags, styrofoam, berry containers, rubber bands, duct tape, etc.
- *Optional: Old plastic tablecloth, tray, or outdoor space*

Instructions:

1. Cut a square of foil that is 8 inches x 8 inches (21 centimeters x 21 centimeters).
2. With the help of a grown-up, pick a good spot to do this activity. You might want to do this activity outside or put down a plastic tablecloth or a tray in case any water spills.
3. Fill the bowl or bin about $\frac{1}{4}$ full of water.
4. Fold the sides up slightly (about $\frac{1}{2}$ inch / 12 millimeters) on the piece of foil and put it into the water. See what it does.
5. Make a guess about how many passengers (the weights) the boat will hold. In your Explorer Notebook or on a piece of paper, draw your boat and your guess for how many passengers you think it will be able to hold before it sinks.

6. Carefully add one passenger at a time until the boat sinks, and keep a running count. Write the number of passengers in your notebook or piece of paper.
7. Using the same piece of foil (or one that is the same size) can you change the design of the boat so it is able to hold more passengers? Remember, you can exchange your piece of foil for a new one, but you can only use one piece of foil to design your new boat! Draw your boat design, write your guess for how many passengers it can hold, test it out, and record the number of passengers it did hold.
8. Continue improving your boat design or test out some other materials and design a new boat with different materials.
 - a. What's the largest number of passengers you can design a boat to hold?
 - b. How do the materials compare to the foil boat?

For explorers using an Explorer Notebook:

1. Keep track of your designs, guesses, and number of passengers that each design holds.

Check out the last page for a page design idea. You can use this or set up your page however you want!

Extensions:

The following are optional steps you can take if you want to extend this adventure:

1. Try using a smaller or larger piece of foil. Does that change how many passengers your boat holds?
2. Put the passengers in different spots on the boat. What happens if they are all in the center? What if they are all spread out? How does the location of the passengers change how many passengers can be on the boat?
3. Decide on a name for the boat and create a story about the boat and the passengers on it.
4. Go to the "In the Water" topic on Flipgrid and share your creation!

Explorer Notebook

You can use this to help you set up your Explorer Notebook!

Design a Boat Module 13, Adventure 1			
Design #	Boat Design (Draw)	How many passengers I think it will hold:	How many passengers it held:
1			
2			
3			
4			