



# Aluminum Foil Boat

## Building Activity

*Did you know that about 100 million years ago, Nebraska used to be covered by an inland sea? Design a boat to sail on the Western Interior Seaway that can hold the most mass without sinking. The catch is that you can only use one piece of foil!*

### What you need:

- Bathtub, sink or tub filled with water
- Towels
- Foil cut into 6-inch squares
- Pennies or washers
- Paper for a recording sheet
- Writing utensil
- Salt (optional)

### What you'll do:

1. Fill your bathtub, sink or a tub with enough water to float a small boat. Cut pieces of foil into 6-inch squares. Gather pennies or washers.
2. Find out what children already know about boats (see questions and prompt ideas below).
3. Present the challenge! Can you design a boat with one piece of foil that holds the most pennies/washers? Make sure child(ren) know that they will only get to use one piece of foil to make their boat!
4. Let children design their boat. You can ask questions or provide prompts as well as answering their questions.
5. When they decide that their boat is ready, help them test it! Ask them to make predictions as to how many pennies/washers they think their boat can hold. Have them place it in the water, and lay pennies/washers one at a time on the boat. Help them count the number if needed.
6. Once the boat sinks, have them write the total number of pennies/washers that it took to sink their boat. See how it compares to other boats.
7. If kids would like to make adjustments, redesign, or create a new boat, encourage them to do so! Then repeat the experiment.
8. Optional: Try dissolving salt into the water. After testing their boats in the fresh water, have them try the boat in the saltwater. How does the number of pennies/washers that their boat can support compare in saltwater versus fresh water?

BUILD



DISCUSS



TEST

### Learn More:

Discover more about Nebraska's past and the Western Interior Seaway to learn why we find so many fossils of sea creatures. Watch University of Nebraska State Museum Highway Paleontologist, Shane Tucker, discuss the Western Interior Seaway and ancient sea creatures found in Nebraska.





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### Questions and Conversation Starters:

- What do kids know about boats? What are boats made of? What materials float and what materials sink? You could include props such as marbles, straws, and the pennies/washers to show that some items sink in the water and some materials float.
- Make observations and ask questions while children design their boats, such as:
  - I like how you added [design feature].
  - What features do you think can help a boat hold a lot of pennies?
  - What is your thinking behind [design feature]?
  - Where will the pennies go on the boat when we test it in the water?
  - Why did you decide to do \_\_\_\_?
- Discuss water displacement. When a boat floats, it displaces water to make room for itself. Water also pushes back. The more water that a boat displaces, the more force will be pushed back on the boat. The force of the water helps to support the boat, so boats that are displacing more water can typically carry a heavier load than the boats that only displace a small amount of water. Boats that hold the same number of pennies displace the same amount of water.
- Help kids make observations about the boats while they place the pennies inside. Example prompts to get them started:
  - What do you notice happening to the boat?
  - How does the foil adjust when we load in the pennies?
  - Should we place pennies all in one place or distribute them evenly around the boat?
  - How does the location of pennies impact the number of pennies it can hold?
- If multiple people are working on their boats at once, you can discuss how the boats compare to each other. What features do boats that hold a lot of pennies have in common? Was there a ratio that seemed to work regarding size, strength, stability, etc.?
- Help children think about the steps that they took to engineer their boat to solve the problem and meet the challenge. Encourage them to make predictions and test them, communicate observations, discuss conclusions, and redesign to improve. Try multiple boat designs and see what happens!

