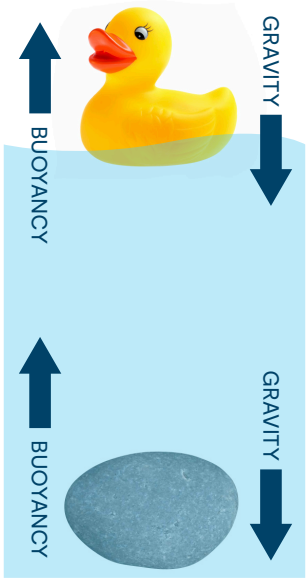
CURIOSITY AT HOME

BOATS AFLOAT

Buoyancy is the upward force of a fluid (liquid or gas) on an object that is fully or partially submerged in

Gravity is the downward force of a body or planet (Earth) has that pulls objects towards its center.



Using the Engineering Process of Design, Test, and Redesign, explore buoyancy and gravity by designing a boat.

MATERIALS

- Aluminum foil
- Scissors
- Shallow plastic or glass container (preferably clear)
- Pennies or metal washers
- Water

PROCEDURE

1. Fill the shallow plastic or glass container at least halfway with water.
2. Cut three to four 5 in. x 5 in. sheets of aluminum foil.
3. Try floating a flat sheet of aluminum foil on the water. Observe what happens. Record your results in the chart.
4. Can the aluminum foil sheet hold any weight? Add a penny or two to find out.

Trial #	Boat Design	Does it Float?	# of Pennies Carried	Observations
1	Flat sheet of aluminum foil			
2				
3				
4				
5				

Experiment continued on next page...

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Show us how you're being curious! Share your results with us.

PACIFIC SCIENCE CENTER

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Challenge: Build a boat that as hold as much cargo (pennies) as possible.

5. **Design**
   a. Think about the boats you have seen.
   b. Using a 5 in. x 5 in. sheet of aluminum foil, design and build a boat that can carry as much cargo (pennies) as possible.
6. **Test**
   a. Place your boat in the water to see if it floats.
   b. Add pennies until the boat begins to sink.
   c. Record your results in the chart below.
7. **Redesign**
   a. Redesign your boat to see if you can hold more cargo.
   b. Things to think about.
      i. Does the shape of the bottom of the boat change how much weight it can hold?
      ii. Does the shape of the bottom of the boat change how stable the boat is?
      iii. How does the placement of the weight affect the boat?
      iv. Are there materials that you could add to the aluminum foil to make the boat float better?

Experiment continued on next page...

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BOATS AFLOAT

K–2 GRADE EXPLORATION

Here are some questions you can explore together.

- Why did you choose to make your boat look like this?
- How did you change your boat to make it better?
- What are boats used for?
- Are boats that are used for different things shaped differently (examples: boats that carry lots of people, boats for fishing, boats for pushing other boats)
- Can you try another shape to see if it works better?