

Tin Foil Boats

Grades: K-5

Subject: Density, buoyancy

NGSS: PS2.B: Types of Interactions
ETS1.A: Defining and Delimiting Engineering Problems

Skills: Active listening, critical thinking, engineering

Materials: Large tray or pool of water, pennies, aluminum foil

BACKGROUND

Density is a measure of how heavy something is compared to its size. One way to consider an object's density is to place it in water. If it is less dense than water, it will float; if it is more dense than water, it will sink. *Buoyancy* refers to an object's ability to float in water. Buoyancy is the force of water pushing up on an object. It relies on both how much water an object displaces and how dense an object is. The less dense an object is, and more water it displaces, the more buoyant it is.



ACTIVITY

1. Go over the background information with your students.
2. Give each student a sheet of aluminum foil with which to make a boat. Instruct them that they are trying to build a boat which will hold the most pennies before sinking.
3. After students are done building, direct their attention to the body of water. Put 15 pennies in some tinfoil and ball it up. Ask students if they think it will float, then test it.
4. Next, have them come up in small groups to test their boats.
5. Begin by placing the foil boats in the water. Add pennies one by one, keeping track of how many the boat can hold before sinking.
6. Compare the designs together as a class. What worked? What didn't?

EXPAND THE ACTIVITY

Teach students more about density with a saltwater density demonstration. Fill two glasses with warm water and add salt to one, mixing it up until it dissolves. Ask students if they think an egg will float or sink in regular water and saltwater. Then, place an egg in each glass. The egg in the saltwater will float while the other sinks. Adding salt to water makes the water denser; as the salt dissolves the water gains mass. Remember that objects float when they are less dense than the liquid they are in. When the water mixes with the salt, the egg becomes less dense than the mixture.

Information and Activity adapted from Little Bins for Little Hands



This activity is an excerpt from the Teacher's Guide to:

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