Elementary Engineering Activity Bag 2

Float Your Boat: Student Activity Guide

If you have ever seen or been on a boat, you know that they are designed to float and carry things. Today you will be a boat engineer. You will design, build, and redesign boats until you get one to float and carry things. Next, you will try to design a boat to carry more weight.

Materials From The Bag

- Foil Container
- Aluminum Foil
- Plastic Bag
- Modeling Clay (half of a stick for this activity, half of a stick for the tower activity)
- Glass Gems
- Index card

You Will Supply These Materials

- Water
- Paper Towels
- Scissors

Preparation: Cut the stick of modeling clay in half. Place one half in the plastic bag to be used for the tower activity.

Part 1: Aluminum Foil Boats

Your first challenge is to get a piece of aluminum foil to float.

1. Fill the container with water, leaving a little room at the top to float your boats.
2. The index card is your boat pattern. Place the card on the aluminum foil and cut the foil to match the pattern.
3. Mold the piece of foil you cut into a boat.
4. To test your boat, place your boat in the container with water. It is ok if your boat does not float at first. Change your boat design, and try again until your boat floats.
5. Draw a picture of your boat.

Part 2: Aluminum Foil Boats - How Much Can Your Boat Hold?

Your second challenge is to see how many glass gems your aluminum foil boat can support before sinking. At any point, if you want a new piece of aluminum foil, you can trace and cut out another piece to make a new boat.

1. Place your boat in the water.
2. Add one gem at a time until your boat sinks. **If your boat takes on any water it is sinking**. *How many gems did it hold?*
3. Continue to change your boat or try new ideas to make the boat hold more gems. Record how many gems your boat holds each time. *Describe what boat design held the most gems.*

Part 3: Clay Boats

Your third challenge is to get a piece of clay to float.

1. Cut the half stick of modeling clay into **two** equal pieces. You will use 1 piece for this part and 1 piece for Part 4.
2. Mold **one** piece of clay into a boat.
3. Test your boat. It is ok if it doesn't float at first. Change it and try again until it floats. *What is different about using clay than foil to make your boat?*
4. Draw a picture of your clay boat.

Part 4: Clay Boats - How Much Can Your Boat Hold?

Your final challenge is to see how many gems your clay boat can support before sinking.

1. Place your boat in the water.
2. Add one gem at a time until your boat sinks. *How many gems did it hold?*
3. Continue to change your boat or try new ideas. Record how many gems your boat holds each time. *Describe what boat design held the most gems.*

Did You Know?

A 20-foot cargo ship weighs around 4,800 pounds, but it can hold up to 48,000 pounds! Each gem weighs about 5 grams, *how many grams did your aluminum boat hold? How many grams did your clay boat hold?*

Boat Type & Weight	Weight Boat Holds (grams)
Aluminum Foil Boat less than 1 gram	
Clay Boat 25 grams	

When you are done with your clay, place it in the plastic bag for the other activities. Save a gem for the tower activity.