



Cuyahoga County  
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# Summer Learning

## Aluminum Foil Boat and Density Challenge

- Hands on experimentation with Density and Fluid using aluminum foil, marbles, and water.
- Create and test a boat using aluminum foil.



### You'll need:

- A large container filled with water (large plastic storage bin, sink, or tub can work).
- Aluminum foil.
- Marbles (or any small equally weighted objects like pennies).
- A towel (in case of splashes).

### What to do:

#### **DENSITY DEMONSTRATION:**

Dense objects have more mass than less dense objects that take up the same amount of space or volume. If two objects have the same amount of mass but have different volumes the object with a greater volume is less dense. Dense objects tend to sink in water and less dense objects tend to float.

1. Using two equal sized sheets of aluminum foil. (At this point both sheets have equal mass, volume, and density.) Fold one sheet neatly and firmly in half as many times as you can.
2. Crumple the other sheet into a ball. (At this point the folded foil has the same amount of mass, a smaller volume, and is more dense than the crumpled ball of foil.)
3. Make a prediction about what will happen to the folded piece of foil and what will happen to the crumbled ball of aluminum foil when they are dropped into water.
4. Drop both aluminum objects into the water and observe what happens.
5. Discuss:
  - a. Did one sink and one float?
  - b. Why do you think that happened?
  - c. Which one is more dense and why?

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## ALUMINUM FOIL BOAT CHALLENGE:

Experiment and have fun with making marbles float in water using aluminum foil and creating a boat (or boats).

1. Drop a marble into water and observe what happens. How does this relate to density?
2. What do you think will happen if you crumple a marble into an aluminum foil ball and drop it in water? Try it and discuss.
3. How many marbles do you think you can crumple into an aluminum foil ball, drop it in water, and still have it float? Try it.
4. Using as much foil as you would like, create an aluminum boat and try to float as many marbles as possible.
5. Put your boat on the water and then count as you place marbles into the boat noting the number that sinks the boat.
6. Discuss:
  - a. How does this relate to density?
  - b. Do you think the shape of the boat matters? How?
  - c. Try to improve your marble score by making a new boat. Discuss your results and observations and compare with your previous boat.



Don't forget to take a photo of your creation, and share it on social media to with **#CCPLSummerSTEAM** to get credit for our Summer Reading Game!

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