



Buoyancy Lab: Aluminum Foil Boat and Pennies

Participation (+4)

30

Introduction

This is a lab designed to experiment with ship shape and study buoyant force. Archimedes Principle is a law of physics stating that the apparent upward force (buoyancy) of a body immersed in a fluid is equal to the weight of the displaced fluid. More simply put, the buoyant force equals the weight of the liquid that is pushed up due to the object being submerged. Each group will be given aluminum foil and asked to design/build a boat that will hold as many pennies as possible without sinking.

Procedure

1. Obtain 2 pieces of aluminum foil.
2. Build 2 different boats. Describe your boat designs under the data section.
3. Make a hypothesis as to how many pennies the boat will hold in the data section Record it under the data section.
4. Place boat in water container 1 at a time. Add one penny to the boat at a time until the boat starts to sink. Record your number of pennies (minus the one that sank it) in the data section. Be sure to dry all pennies between trials!
5. Clean up any spilled water and your work area. Dry off the pennies and return them to the penny bucket.
6. Answer the questions in the data and conclusions sections.

Materials

- Pennies
- 2 - 5 inch x 5 inch squares of aluminum foil
- 1 - Ruler

Data (+1 per box)

Hypothesis: The boat will hold _____ pennies.	Description of boat design <u>and</u> why you chose that design.	Draw a picture of your boat.	What are the dimensions of the boat? (metric)	Actual Result: My boat DID hold _____ pennies.

Conclusion

1. Which boat design worked the best? Why do you think this design worked as well as it did compared to your other boat? (+2)

Name: _____ Date: _____ Hour: _____

2. The design of your boat would be your _____ variable because it is the main variable being tested. (+2)
3. What challenges did you face in creating a boat that was able to carry several pennies? (+2)
4. What does Archimedes Principle state? What is buoyant force? (+2)
5. A sealed 1-liter container is held halfway under water. How much water will be displaced? (+2)
6. A stone is thrown into a deep lake. As it sinks deeper and deeper in the water, does the buoyant force on it increase, decrease, or remain unchanged? (+2)
7. Now that you have tested different designs and have learned more about buoyancy. Explain why a ship's shape allows it to float. (+4)

