

Name: _____
Date: _____
Block: _____

Density Cube Lab

Objective:

To determine the density of certain materials and hypothesize which will float based on non-science related methods.

Formulas:

$$D = m/v \text{ (g/cm}^3\text{)}$$

$$\text{Volume} = l \times w \times h$$

$$1 \text{ mL} = 1 \text{ cm}^3$$

Materials:

Density cube set
Triple Beam Balance
250 mL PLASTIC beaker
Ruler

Procedure:

1. Take the mass of each cube using the triple beam balance and record in the table in the data section of this lab.
2. Take the volume of each cube by using the ruler and record in the table.
3. Hypothesize whether each cube will float or whether it will sink and record in table.
4. Fill your beaker to 150 mL with water.
5. Drop each cube in the water and record what happens.
6. Next, record the displacement of water (this is the volume)
 - a. Does it equal your recorded volume?
7. Repeat with other cubes
8. If the cube does not sink, then use a pencil to push it to the bottom of the beaker.
9. Calculate density for each cube.

Use the following formula: $Work = Force \times Distance$, calculate the answers to questions 22 and 23. Work is measured in Nm or Joules (J), force is measured in Newton (N) and distance is measured in meters (m).

22. A force of 15 N is used to push a book 3 meters, how much work was done?

- a. 5 J b. 45 J c. 12 J d. 18J

23. It took 50J of work to move a chair 5 m. How much force was used?

- a. 250 N b. 25 N c. 10N d. No force can be measured.

24. Several common metals are listed in this chart.

Common Metals

Metal	Density (g/cm ³)
aluminum	2.7
iron	7.9
lead	11.4
silver	10.5

Assuming equal masses of each, a cube of which metal would have the greatest volume?

- a. aluminum b. iron c. lead d. silver

25. This chart represents the melting points and boiling points for four substances.

Melting and Boiling Points of Substances

Name	Melting Point (°C)	Boiling Point (°C)
Chlorine	-34	-35
Nitrogen	-196	-183
Oxygen	-218	-183
Hydrogen	-253	-253

Which substance is a solid at -200°C ?

- a. Chlorine b. Nitrogen c. Oxygen d. Hydrogen

26. How does ice cool a warm drink?

- a. Cold flows from the ice to the drink. b. Heat flows from the ice to the drink.
 c. Cold flows from the drink to the ice. d. Heat flows from the drink to the ice.

27. Which of the following is an example of kinetic energy?

- a. a car not moving b. a rock resting on a ledge
 c. water falling over a dam d. a person sitting in a chair