

Phet Interactive Solutions

Density

My Block Material
Mass 4.99 kg
Volume 5.00 L
Density 1.00 kg/L
Wood Ice Brick Aluminum

Virtual Density Lab

1. Go to: <https://phet.colorado.edu/en/simulation/legacy/density> (Click the link on Google Classroom)
2. You will see a block of wood in water.
3. Using the table at the top left and clicking on the drop down menu at the top find the following information:
4. What can you say about the density and the material's ability to float?

Material	Mass	Volume	Density	Float or Sink?
Styrofoam				
Wood				
Ice				
Brick				
Aluminum				

- Structure & Properties of Matter
 - Calculating density
- Science & Engineering Practices
 - Analyzing & Interpreting Data
 - Using Mathematics & Computational Thinking
 - Measure mass, volume, & calculate density.
 - Use information along with data in a table to identify the materials each cube is made up of.
 - Use evidence to explain observations & draw additional conclusions.

PhET Interactive Solutions: Density

- I used this resource with 10 students who require additional support in core subject areas. Students were 10th & 11th graders enrolled in Chemistry or Earth Science.
- Material is relevant to both subject areas and provides support in mathematics & computation.
- Graphics are simple and did not distract my students.
- Groups completed the “Virtual Density” lab simulation in under 30 minutes.
- This simulation was easy to navigate; the lab worksheet provided very clear instructions as well as screenshots to follow. My students did not become frustrated attempting to use this simulation.



Block	Mass	Volume	Density	Material
A	65.14	13.38	19.272	gold
B	0.64	1.0	0.64	apple
C	4.09	5.830	0.6998	gasoline
D	3.10	3.38	0.917	ice
E	3.53	1.00	3.53	diamond

3. Which of these blocks floated? C, D, and B

4. Which of these blocks sank? E and A

5. Why did they do this?
All the blocks under 1.0 floated mostly. The 3.53 and 19.272 sank.

PhET Interactive Solutions: Density

- The only time students requested my intervention was in Part 3, when they had to enter the volume of the mystery blocks through water displacement. In the earlier stages of the lab, the volume was provided to them. Now, they had to mass the blocks, put them in the water to determine volume, calculate density, and use information from a table to determine each block's material.
- Once I modeled how to drag the block under the water and subtract the difference from the original water volume, they quickly edited the information in their table and recalculated the density.
- Both groups correctly determined the material of each block using their data and were able to explain why some objects sink and others float.
- Students completed a follow-up where they used physical objects, balances, & water to determine which objects would float the best.

