

DENSITY

Worksheet



Name:

Class:



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LIVEWORKSHEETS



Why do some objects float on water while others sink?

- ☐ Because water always pushes objects upward.
- ☐ Because water sometimes holds up objects and sometimes does not.
- ☐ Because objects float if they are small, and sink if they are big.
- ☐ Because objects with lower density than water float, and those with higher density sink.



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● Learning Outcome

By the end of this lesson, you will be able to:

- Calculate density using given mass and volume values.
- Explain why objects float or sink based on density.
- Conduct a simple virtual lab to determine density.



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Watch this video

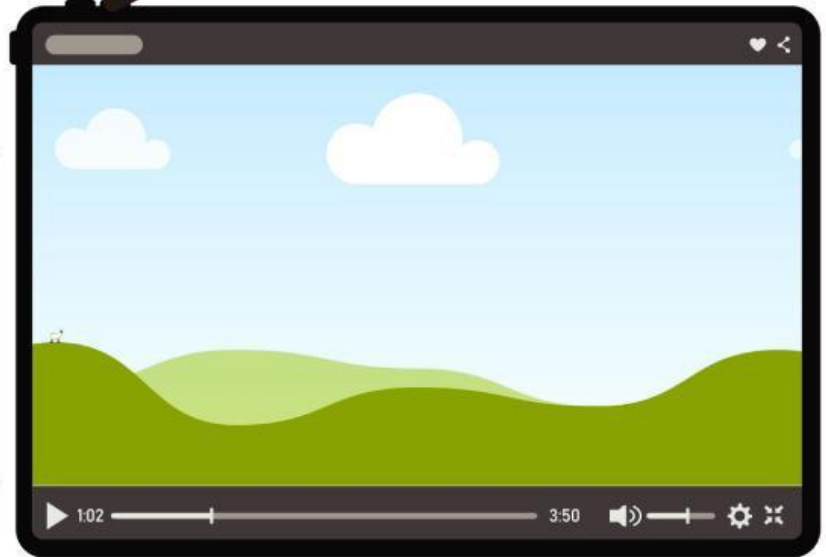
In this video, you will learn about density.

It explains how density is the relationship between mass and volume.

The video shows simple examples:

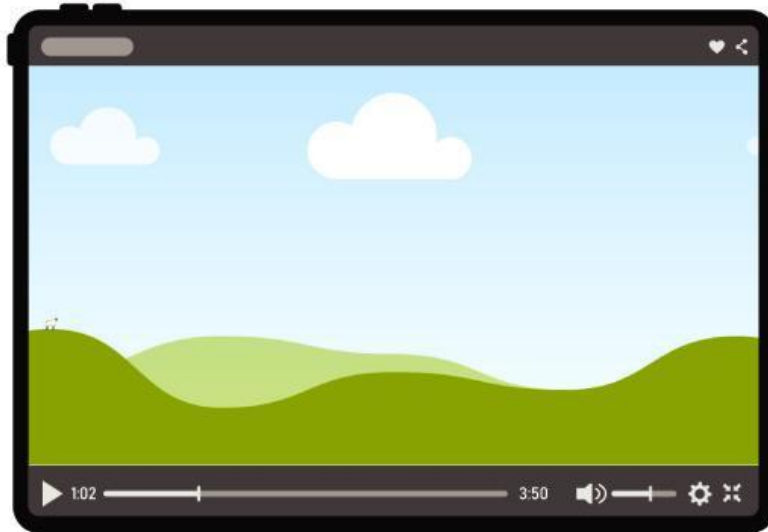
- Oil floats on water.
- Wood can float, but metal sinks

Watch carefully, because after this you will do some interactive exercises.





Watch this video



After watching the video,
answer this question

**Which of the following
best defines density?**

- ☐ The heaviness of an object compared to gravity.
- ☐ How much mass is packed into a given volume.
- ☐ How fast an object sinks in water.
- ☐ The size of an object regardless of its mass.



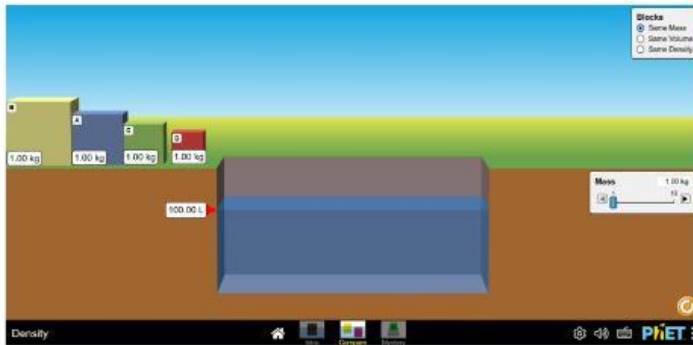
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DENSITY LAB

After learning the concept of density from the video, let's do this virtual lab activity to understand it better.

Observe how mass and volume impact to the density!

Open the simulation at: PhET Density Simulation



Experiment 1 – Same Mass

1. Click the same mass button
2. Drag the objects A, B, C, & D to water tank
3. Observe which objects float and which sink.

Experiment 2 – Same Volume

1. Click the same volume button
2. Drag the objects A, B, C, & D to water tank
3. Observe which objects float and which sink.

Experiment 3 – Same Density

1. Click the same density button
2. Drag the objects A, B, C, & D to water tank
3. Observe which objects float and which sink.

Based on the Experiment, choose whether this statement true ☒ or false ☐

Experiment 1: Objects with the same mass but different volumes

If all objects have the same mass, the object with the largest volume will always float higher. ☒ ☐

When mass is the same, objects with smaller volume have greater density. ☒ ☐

In this experiment, the sinking or floating behavior depends only on volume. ☒ ☐

Experiment 2: Objects with the same volume but different masses

If all objects have the same volume, the one with greater mass will have higher density. ☒ ☐

Objects with equal volume but different mass will always float at the same depth. ☒ ☐

In this experiment, the floating behavior depends on mass differences. ☒ ☐

Experiment 3: Objects with the same density

If objects have the same density, they will all either sink or float in the same way, regardless of their mass or volume. ☒ ☐

Larger objects with the same density as smaller objects will float differently in water. ☒ ☐

Density is a property of the material, not the size of the sample. ☒ ☐



BUILDING A DENSITY COLUMN

Density is a property of matter that compares the mass of a substance to how much space it takes up, or its volume. You can calculate the density of a substance by dividing the mass of the substance, in grams (g), with its volume, in milliliters (mL).

A density column is created by pouring liquids into a cylinder so they separate based on their density. Less dense liquids will float near the top while more dense liquids will sink to the bottom of the cylinder.

Complete the table below by using the formula $\text{density} = \text{mass} / \text{volume}$. Then drag the liquids at the bottom of the page to the cylinder in the correct order to create a density column.

| SUBSTANCE | mass (g) | volume (mL) | density (g/mL) |
|-----------------|----------|-------------|----------------|
| VEGETABLE OIL | 115 | 125 | |
| MILK | 154.5 | | 1.03 |
| RUBBING ALCOHOL | 98.75 | 125 | |
| HONEY | | 250 | 1.36 |
| WATER | 200 | 200 | |



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Matching Questions

Match the terms with the correct explanation.

mass

The formula of density

volume

Mass per unit volume

Density

The space an object takes up

$\rho = m/V$

Object that floats on water

High density object

The amount of matter in an object

Low density object

Object that sinks in water



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Well done!



You have completed the activities about density.

Now you know that **density** depends on **mass** and **volume**, and it explains why some objects float while others sink.

Don't forget that density is not only a formula, but also something we can observe in real life, like oil floating on water.



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