

A – How are mass, volume, and density related?

1. Play around with the simulation. What can you do? What happens? Talk about what you find with someone at your table.

2. Class Discussion: Share all the things you found that you can do with the simulation.

3. Exploring different materials and different sizes.

a. Which materials **sink**?

b. Which materials **float**?

c. Keep exploring ...

In your own words, what you think the label "**Volume**" means?

What you think the label "**Mass**" means?

d. Explore what happens when you make the block bigger and smaller.

Does the **Mass** change?

Explain why this makes sense:

Does the **Density** change?

Explain why this makes sense:

Does the **floating** or **sinking** change?

4. Design your own block!

Experiment with **making your own block out of your own material** with "My Object".

a. What **properties** of the block can you change?

b. What makes a block more likely to **sink**? How does this change the block's **density**?

c. What makes a block more likely to **float**? How does this change the block's **density**?

Try to create a block with a very **HIGH density**.

Do you think your block will **sink** or **float**?

What is your block's **volume**? _____

What is your block's **mass**? _____

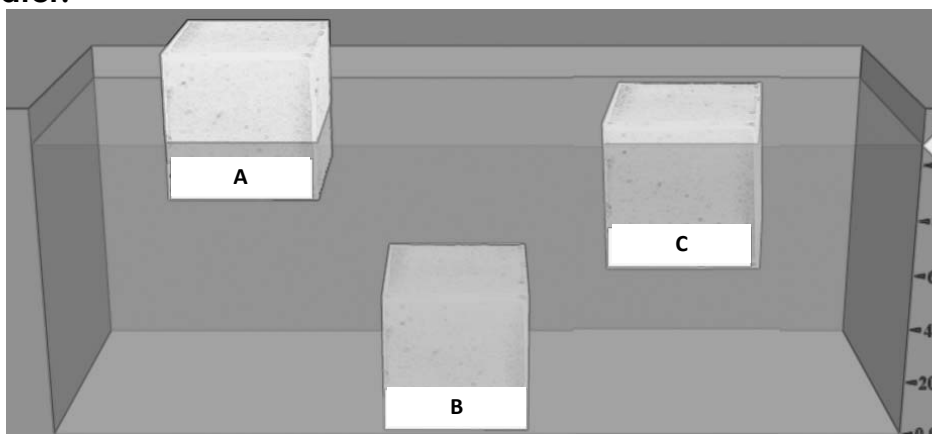
Try to create a block with a very **LOW density**.

Do you think your block will **sink** or **float**?

What is your block's **volume**? _____

What is your block's **mass**? _____

5. Your friend has three blocks (A, B, and C) of the same volume, but they each float differently in water.



a. What do you think is making them **float** differently?

b. Using "My Object", check your answer by playing with your block to make it behave like A, then B, then C.

Which slider did you need to change?

Could A, B, and C be made out of the same material? Why or why not?

Which object must have the **most mass**?

Which has the **second most mass**?

Which has the **least amount of mass**?

6. Test your ideas using the objects of "same volume".

a. All of these blocks are the same _____

b. Besides being different colors, the blocks also have different _____

7. Explore objects of the "same mass".

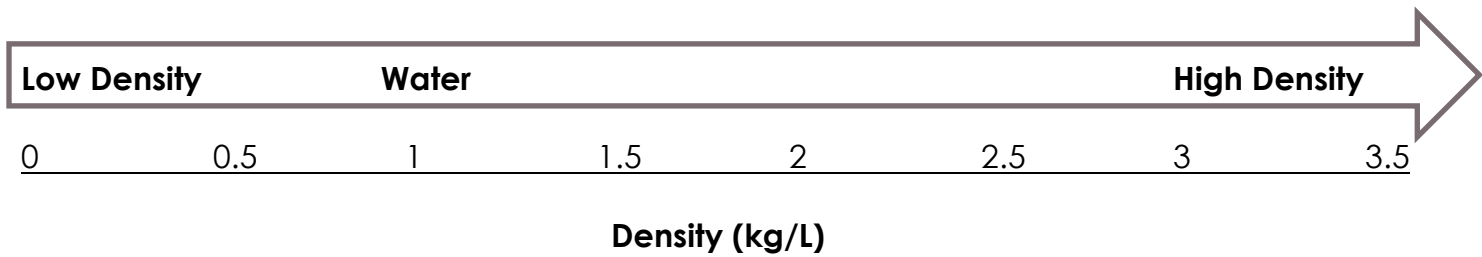
a. All of the blocks have a **mass** of _____ kg.

b. All of the blocks are different colors and different _____

c. Observe how they **float**. What do you notice?

d. If all of the blocks have the same **mass**, why do you think some are **floating** and some **sinking**?

8. Work in Partners:



Let's figure out where to write these labels on the density scale:

- Sinks quickly
- Barely sinks
- Barely floats
- Floats well

9. Calculating Density

We can figure out the **density** of blocks using division if we know their **volume** and **mass**.

The equation is $density = \frac{mass}{volume}$. Let's try this using the "mystery tab"!

Object	Mass (kg)	Volume (L)	Density (kg/L)	Sink or Float?
A				
B				
C				
D				
E				