**Name: \_\_\_­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Grade \_\_\_/15**

**Exploring Floating and Sinking**

**Learning Objectives:**

1. Classify matter based on physical properties, including relative density (sinking and floating).
2. Be able to rank the relative density of objects after observing their floating behavior
3. Be able to determine density of an object through measurement

**Exploring different materials and different sizes. (2 point)**

Play around with the simulation and try changing the material and the size. Then answer the following questions.

a. Which materials sink? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Which materials float? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Design your own block!** (1 point)

Experiment with **making your own block out of your own material** with “**My Block**”.

What properties of the block can you change?

What makes a block more likely to sink? How does this change the block’s density?

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.** (2 point)

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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Investigate**: (2 points)

1. On the Blocks menu (top right) select Same Mass.
2. One at a time, take a block, lower it into the liquid, and record its volume. If it floats, you will need to hold it under the water to record its volume. Then calculate each block’s density.

|  |  |  |  |
| --- | --- | --- | --- |
| Blue | Mass |  | D = m/V |
| Volume |  |
| Yellow | Mass |  | D = m/V |
| Volume |  |
| Green | Mass |  | D = m/V |
| Volume |  |
| Red | Mass |  | D = m/V |
| Volume |  |

1. Repeat for Same Volume. (2 points)

|  |  |  |  |
| --- | --- | --- | --- |
| Blue | Mass |  | D = m/V |
| Volume |  |
| Yellow | Mass |  | D = m/V |
| Volume |  |
| Green | Mass |  | D = m/V |
| Volume |  |
| Red | Mass |  | D = m/V |
| Volume |  |

1. Repeat for Same Density (2 points)

|  |  |  |  |
| --- | --- | --- | --- |
| Blue | Mass |  | D = m/V |
| Volume |  |
| Yellow | Mass |  | D = m/V |
| Volume |  |
| Green | Mass |  | D = m/V |
| Volume |  |
| Red | Mass |  | D = m/V |
| Volume |  |

1. Repeat for Mystery. This time you will also have to take the mass of each object. After computing the density, select Show Table and identify each object. (4 points)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **A** | Mass |  | D = m/V | Identification |
| Volume |  |
| **B** | Mass |  | D = m/V |  |
| Volume |  |
| **C** | Mass |  | D = m/V |  |
| Volume |  |
| **D** | Mass |  | D = m/V |  |
| Volume |  |
| **E** | Mass |  | D = m/V |  |
| Volume |  |