**Online Density Lab:**

**Name: Date: Period:**

**Pre-Lab Questions: Floating and Sinking**

You have a block, and you see that it floats in water. What could it be made of?

What do you think will happen if you make a bigger block out of the same material? Will it float or sink?

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You have another block that sinks. What could it be made of?

What do you think will happen if you make a smaller block out of the same material? Will it float or sink?

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Why do you think Block #1 floats and Block #2 sinks?

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**Go to:** <http://phet.colorado.edu/sims/density-and-buoyancy/density_en.html>

**Lab:**

1. Play around with the sim. What can you do? What happens? Talk about what you find with your partner.

2. Exploring different materials and different sizes:

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

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

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

Does the Mass change? Explain why this makes sense:

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 Does the Density change? Explain why this makes sense. Does floating and sinking change:

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3. Design your own block!

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

 What properties of the block can you change?

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

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

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4. 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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



1. What do you think is making them float differently?

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1. 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?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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Which object must have the most mass? \_\_\_\_\_

Which has the second most mass? \_\_\_\_\_\_\_

Which has the least amount of mass?\_\_\_\_\_\_\_\_

**Post Lab Questions:**

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1. You have 5 blocks that are the same size, but different masses. The lightest one is 1kg, the heaviest one is 5kg.

The picture shows how the 2kg and 5kg blocks float and sink in water.

**On the picture, draw where the other blocks would end up if you put them in the water.**

**Explain why you think it would look that way?**

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1. This picture shows a large block that sinks in the water, and a much smaller block of the exact same material sitting outside of the water.

**On the picture, draw what you think would happen if you put the smaller block into the water.**

**Would it float or sink, or does it depend?**

**The density of the smaller block is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the density of the larger block.**
 (smaller than, same as, larger than)