1. 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:

Does the Density change?

Explain why this makes sense:

Does the Specific Gravity change?

Explain why this makes sense:

Does the floating or sinking change?

Justify your answer:

2. 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?

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?

3. Your friend has three blocks (A, B, and C) of the same size, but they each float differently in water. Note that the density of water is 1.00 kg/L.



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?

Rank the objects in order of their density from least to greatest density.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ < \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ < \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

5. 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?

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

6. Calculating Density and Specific Gravity

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

The equations are  and 

Let’s try this using the “mystery tab”. Use the “show table” button to view a list of densities of materials. Use your observations and measurements to identify each block A, B, C, D, E as one of the materials on the list. You do not have to fill in every cell in the table, for materials that do not submerge completely you will not be able to determine the volume measurement using the tank volume change. Think about other observations you can make to figure out how the densities and specific gravities compare.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Object | Mass  (kg) | Volume  (L) | Density  (kg/L) | Specific Gravity | Sink or Float? | Approximate  % submerged | Material |
| A |  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |  |
| C |  |  |  |  |  |  |  |
| D |  |  |  |  |  |  |  |
| E |  |  |  |  |  |  |  |

Justify your choices of materials for each block.