

Physical & Chemical Changes: Simulations

1. Logon as Username: Marshall, No Password
2. Go to <http://www.strangematterexhibit.com/>
3. Click on "Crush Stuff"
4. Choose a match & complete the table below.



Match # _____

Name the 2 competitors in the Smackdown: (1) _____ & (2) _____

What are the weaknesses of each competitor?

1. _____
2. _____

Click on the lever to crush them!

Describe the results:

1. _____
2. _____

Did the substance undergo a PHYSICAL change or a CHEMICAL change? _____

Explain:

5. Now click on "Transform Stuff".
6. Choose ONE raw materials & fill in the data table.



Raw Material	Heat	Beat	Treat	New Product	What is the new product used for?
	X	X			
		X	X		
	X		X		
	X	X	X		

Describe the properties of the raw material:

Did the material undergo a PHYSICAL or a CHEMICAL change? _____

Explain:

1 pt extra credit printing

Which are physical changes and which are chemical changes?

- a. boil
- b. burn (combustion) -
- c. condense -
- d. corrode -
- e. crumple -
- f. ferment -
- g. melt -
- h. rust -
- i. crush -
- j. freeze -
- k. oxidize -
- l. tarnish -
- m. explode -
- n. grind -
- o. rot -
- p. vaporize -
- q. photosynthesis -

Which are physical changes and which are chemical changes?

- a. perfume evaporating on your skin -
- b. butter melting -
- c. wood rotting -
- e. autumn leaves changing color -
- f. a hot glass cracking when placed in cold water -
- g. melting copper metal -
- h. burning sugar -
- i. mixing sugar in water -
- j. digesting food -

Conclusion: What did you learn from this lab? 3 sentences

Have extra time? Go back & crush some more stuff!!!

Virtual Lab : Click link On Web page or: http://glencoe.mcgraw-hill.com/sites/0078741858/student_view0/unit1/chapter3/virtual_labs.html#

Why do things float?

When an object is placed in a fluid such as water, forces such as buoyancy act on the object. Buoyancy acts against the weight of an object and pushes it upward. The upward force, called the buoyant force, opposes the downward force of gravity.

Archimedes, a Greek mathematician, made an important discovery about buoyancy. According to Archimedes' Principle, the buoyant force on an object is equal to the weight of the fluid displaced, or pushed away, by the object. Weight is the measure of the force of gravity on an object. Weight is determined by mass, the amount of matter in an object. Archimedes stated his principle in terms of weight and not mass because scientists in ancient times were not yet aware of the idea of mass.

Archimedes' Principle explains why an object will float or sink. If the object displaces an amount of water that weighs as much as or more than the object, the object will float. For example, even though a beach ball displaces only a small amount of water, the mass of the displaced water is greater than the mass of the beach ball. This is why the beach ball floats. An object that has more weight and mass than the water it displaces, such as a rock, will not float.

In this Virtual Lab, you will find the mass of an object using an electronic balance. You will then predict if an object will float by comparing its mass to the mass of the water displaced by the object.

To do this Virtual Lab, you will need to convert the volume of the water displaced from milliliters (mL) to grams (g). The mass of 1 mL of fresh water is 1 g. If you know the volume of water displaced, you also know the mass of the water displaced. For example, if the volume of water displaced is 5 mL, the mass of the water displaced is 5 g. If the volume is 2.7 mL, the mass is 2.7 g, and so on.

Objectives:

- State Archimedes' Principle.
- Describe Archimedes' Principle in terms of buoyancy.
- Predict whether objects will float or sink in water.

Procedure:

1. Find the mass of an object by dragging it to the electronic balance. Record its mass in the Table.
2. Drag the object above the tank and drop it into the water.
3. Read the graduated cylinder. Record in the Table the volume of the water displaced by the object.
4. Compare the mass of the object to the volume of the water displaced. Remember to convert the volume of the water to its mass in grams.
5. Hypothesize whether the object sank or floated by clicking the radio button next to "float" or "sink." Check your hypothesis by clicking Watch What Happened.
6. Did the object sink or float? Enter the results of the experiment in the Table.
7. Repeat steps 1-6 for each object.
8. Complete the Journal questions.

Virtual Lab: Data Table:

Material	Mass (g)	Volume of Water displaced in ml	Sinks or Floats	Explanation? Remember your formula
Wood				
Aluminum				
Plastic				
Lead				
Cork				
Steel				
Clay				
Rubber				
Candle				

Density Questions & Calculations: SHOW YOUR WORK!!

Density: $D = m/v$ (mass / volume)

You can also rearrange the formulas as:

Mass: $m = D \times V$ or Volume: $V = m/D$

1. Find the density of a substance with a mass of 5kg and a volume of 43 m³
Show your work!
2. Suppose you have a lead ball with a mass of 454g.
What is its volume? (density of lead is: 11.35 g/cm³)
Show your work!
3. What is the mass of a 15mL sample of mercury?
(density of mercury is: 13.55 g/cm³)
Show your work!
4. A block of pine wood has a mass of 120g and a volume of 300 cm³. What is the density of wood?
Show your work!