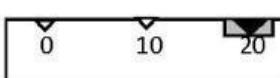


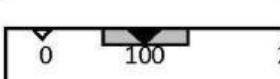
Name: \_\_\_\_\_

Teacher: G P S

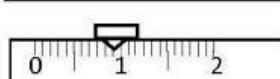
Period: \_\_\_\_\_

**Study Guide: CRM 2.3 - Properties & Changes of Matter****Activity 1: Measuring Matter**

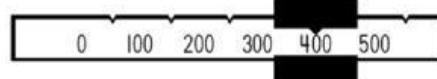
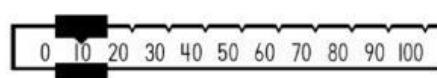
Using the sliders from a triple beam balance- include units...



What is the mass of the object to the left? \_\_\_\_\_



What is the mass of the object to the right? \_\_\_\_\_

**Mass vs weight....which changes with gravity?** \_\_\_\_\_

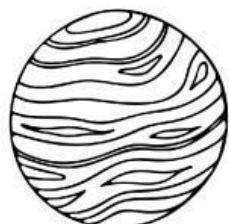
Which stays the same for the same object no matter where it is found? \_\_\_\_\_

On which planet would you have more mass? \_\_\_\_\_

On which planet would you weigh more? \_\_\_\_\_



Earth



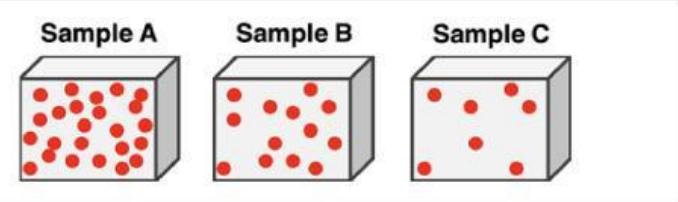
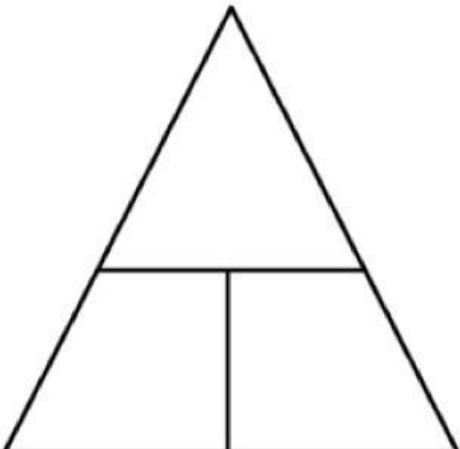
Jupiter

**Find the Volume for each of these objects**

Regular Objects	Liquids- 2 examples	Irregular Objects- the pebble
$V = \text{_____} \times \text{_____} \times \text{_____}$	Tool: _____	Technique: _____
Volume with units: _____	Volume with units: 1. _____ 2. _____	Volume with units: _____

## 2.3 Prop & Changes of Matter

### Activity 2: Density

	<p>Which has the greatest density? _____</p> <p>Which has the least density? _____</p>																
<p>Fill in the Density Triangle:</p> 	<p>1. Unknown A:</p> <table border="1" data-bbox="890 496 1457 608"> <tr> <td>Density:</td> <td>Mass: 1932 g</td> </tr> <tr> <td></td> <td>Volume: 100 cm<sup>3</sup></td> </tr> </table> <p>2. Unknown B:</p> <table border="1" data-bbox="890 669 1457 781"> <tr> <td>Density:</td> <td>Mass: 178.4 g</td> </tr> <tr> <td></td> <td>Volume: 20 cm<sup>3</sup></td> </tr> </table> <p>3. Unknown C:</p> <table border="1" data-bbox="890 842 1457 954"> <tr> <td>Density: 2.64 g/cm<sup>3</sup></td> <td>Mass:</td> </tr> <tr> <td></td> <td>Volume: 55 cm<sup>3</sup></td> </tr> </table> <p>4. Unknown D:</p> <table border="1" data-bbox="890 1015 1457 1127"> <tr> <td>Density: 3.52 g/cm<sup>3</sup></td> <td>Mass: 704 g</td> </tr> <tr> <td></td> <td>Volume:</td> </tr> </table>	Density:	Mass: 1932 g		Volume: 100 cm <sup>3</sup>	Density:	Mass: 178.4 g		Volume: 20 cm <sup>3</sup>	Density: 2.64 g/cm <sup>3</sup>	Mass:		Volume: 55 cm <sup>3</sup>	Density: 3.52 g/cm <sup>3</sup>	Mass: 704 g		Volume:
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	Volume:																
<p>For the Unknowns on the right, calculate the missing value and then use the Table of Densities below to identify each of the unknown substances.</p>																	
<b>Table of Densities</b>																	
<b>Solids</b>	<b>Density g/cm<sup>3</sup></b>	<b>Solids</b>	<b>Density g/cm<sup>3</sup></b>														
Marble	2.56	Copper	8.92														
Quartz	2.64	Gold	19.32														
Diamond	3.52	Platinum	21.4														
<p>5. Now let's calculate a half size sample of Unknown A:</p>																	
<table border="1" data-bbox="112 1724 827 1792"> <tr> <td>Density:</td> <td>Mass: 966 g (half of 1932 g)</td> </tr> </table>		Density:	Mass: 966 g (half of 1932 g)														
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<table border="1" data-bbox="827 1724 1468 1792"> <tr> <td></td> <td>Volume: 50 cm<sup>3</sup> (half of 100 cm<sup>3</sup>)</td> </tr> </table>			Volume: 50 cm <sup>3</sup> (half of 100 cm <sup>3</sup> )														
	Volume: 50 cm <sup>3</sup> (half of 100 cm <sup>3</sup> )																
<p>6. Did the density change?</p>																	

## 2.3 Prop & Changes of Matter

### Activity 3: Properties of Matter

Match the property to its best definition

1. Melting point

- a. How well electric currents move through a substance
- b. Ability to burn easily
- c. Amount of matter packed into a given amount of space
- d. Ability to be rolled or pounded into different shapes
- e. Force of attraction that can act at a distance
- f. Rate at which a substance transfers heat
- g. Ability of a substance to dissolve into another substance
- h. Temperature a substance changes from solid to liquid
- i. Ability to interact with another substance to form a new substance
- j. Temperature a substance changes from a liquid to a gas

2. Boiling point

3. Magnetism

4. Thermal conductivity

5. Electrical conductivity

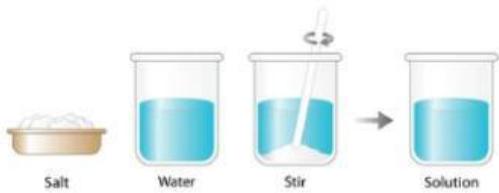
6. Malleability

7. Solubility

8. Reactivity

9. Flammability

10. Density



Making a Solution:

1. The salt is the \_\_\_\_\_
2. The water is the \_\_\_\_\_
3. The solution is \_\_\_\_\_

### Size Dependent or Size Independent?

Place the words from the word bank into the correct category. Remember size independent are characteristic properties.

**Word Bank:** melting point • solubility • volume • magnetism • conductivity • weight • malleability • density • reactivity • flammability • mass

Size Dependent	Size Independent

## 2.3 Prop & Changes of Matter

### Activity 4: Characteristic Properties

Use the table of characteristic properties and the descriptions to determine the identity of these mystery metals:

Property	Aluminum	Iron	Gold	Nickel
Density	2.70	7.87	19.3	8.90
Melting Point	660 °C	1538 °C	1064 °C	1455 °C
Thermal conductivity	237	79	315	91
Electrical conductivity	62%	17%	76%	22%
Magnetism	no	yes	no	yes

1. Mystery Metal A is not magnetic and is the best conductor of both thermal and electrical energy:
2. Mystery Metal B is the least dense, is not magnetic, and melts the fastest:
3. Mystery Metal C is attracted to a magnet and would be a liquid by 1500 °C:
4. Mystery Metal D has the highest melting point and is the worst conductor of electricity:

### Activity 5: Kinds of Changes

1. In a \_\_\_\_\_ change, you change how a substance looks or feels, but not what it is.
2. In a \_\_\_\_\_ change, you turn something into an entirely new substance with its own unique properties.

*Identify the type of change- Physical or Chemical?*

- |                         |   |   |                                 |   |   |
|-------------------------|---|---|---------------------------------|---|---|
| 1. Water boiling        | P | C | 6. Dissolving Kool Aid in water | P | C |
| 2. Baking a cake        | P | C | 7. Bike chain rusting           | P | C |
| 3. Lighting a candle    | P | C | 8. A firework exploding         | P | C |
| 4. Banana turning brown | P | C | 9. Boiling water for tea        | P | C |
| 5. Crushing a can       | P | C | 10. Digesting food              | P | C |

List at least 6 clues that can help you determine if a Chemical Change may have occurred:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

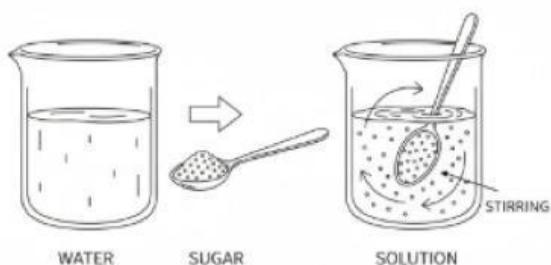
## 2.3 Prop & Changes of Matter

### Activity 6: Conservation of Matter

Complete the Law of Conservation of Matter:

1. Matter cannot be \_\_\_\_\_ or \_\_\_\_\_, it can only be \_\_\_\_\_.

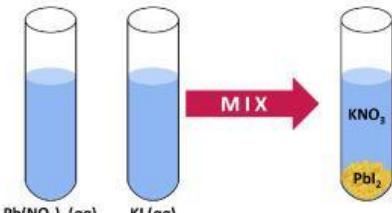
Kind of Change:



Start: 100g water + 25g sugar

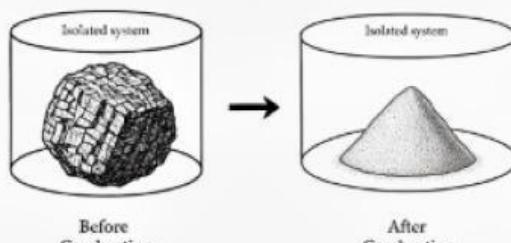
End: \_\_\_\_\_

Kind of Change:



Start: 100g + 100g

End: \_\_\_\_\_



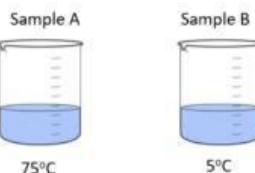
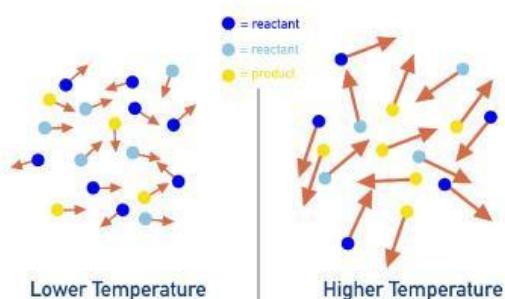
Start: 500g coal

End: \_\_\_\_\_

2. The mass of the \_\_\_\_\_ (or things you start with) is always equal to the mass of the \_\_\_\_\_ (or things you have at the end)

### Activity 7: Temperature and Reaction Rates

Circle the temperature where the particles move faster:



1. In which sample would Alka Seltzer dissolve faster?
2. In which sample would sugar dissolve slower?
3. In which sample would a glow stick last longer?