**Unit 1: Extra Practice Sheet**

**States of Matter:**

|  |  |  |  |
| --- | --- | --- | --- |
| **When you change from \_\_\_\_\_\_ to \_\_\_\_\_\_, what is happening:** | **Gas to Liquid** | **Solid to Liquid** | **Solid to Gas** |
| To the energy of the particles: |  |  |  |
| To the speed the particles are moving: |  |  |  |
| To the spacing between the particles: |  |  |  |
| To the temperature of the whole substance: |  |  |  |
| And what do we call that phase change from \_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_: |  |  |  |
| Real life example of this phase change: |  |  |  |

**List the 3 steps of the Kinetic Theory of Matter / Atomic Theory:**

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

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Matter:**

|  |  |  |  |
| --- | --- | --- | --- |
| Material | **Pure Substance or Mixture** | **Element, Compound,**  **Homogeneous, Heterogeneous** | **Separated Chemically or Physically?** |
| The AIR you breathe |  |  |  |
| Pure Helium Gas (He) |  |  |  |
| Sugar (C6H12O6) |  |  |  |
| Chex Mix |  |  |  |
| Carbon Dioxide (CO2) |  |  |  |

**Chemical vs Physical Changes and Properties**

In the table below, write YES in the box that matches with the corresponding scenario. The first 2 are done as an example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Physical Property | Physical Change | Chemical Property | Chemical Change |
| Ice Melting |  | YES |  |  |
| Bonds are broken, molecules are rearranged, new bonds form |  |  |  | YES |
| Color / Texture / Shape |  |  |  |  |
| Frying an Egg |  |  |  |  |
| Reactivity with Water or Acid |  |  |  |  |
| Gasoline burning |  |  |  |  |
| Chewing Food |  |  |  |  |
| Malleability / Ductility |  |  |  |  |
| Car Rusting |  |  |  |  |
| Flammability |  |  |  |  |
| Alka Seltzer put in water gives off a gas |  |  |  |  |
| Butter Melting |  |  |  |  |
| When you mix an acid and a base, a solid salt will appear as a product |  |  |  |  |
| Chopping a board in half at karate class |  |  |  |  |

**Density**:

1. What are the two different units for density?
2. I mix two different liquids together into a beaker, and observe. One liquid floats to the top, so that it is “sitting” on top of the other. What can you tell me about the densities of these two liquids?
3. Using the table to the right, if we were to place all 6 of these substances into a graduated cylinder to form a “density column”, which substance would end up on top? Which would be on the bottom? Place all 6 of these substance in order from top to bottom of your imaginary graduated cylinder, based on the densities listed in the table.

|  |  |
| --- | --- |
| **Substance** | **Density (g/ml)** |
| Corn Syrup | 1.38 |
| Vegetable Oil | .85 |
| Mercury | 13.6 |
| Corn Oil | .925 |
| Glycerine | 1.26 |
| Water | 1.0 |

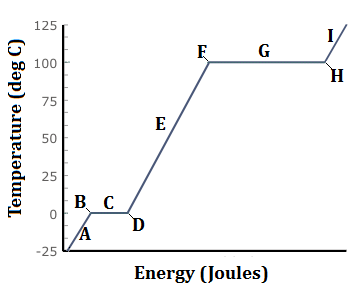
TOP

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

BOTTOM

1. Mercury has a density of 13.6 g/ml. Assuming that I have 3.8ml of it inside of an old school thermometer, what is the mass of that sample of mercury?
2. A brick that has a height of 0.1m a width of 0.25m, and a depth of 0.2m. It also has a mass of 575 grams. What is the density of this block?
3. A rock with a mass of 875 grams is dropped into a tank of water that has 500ml of water in it. When the rock enters the water, the water level rises to 670ml. What is the density of that rock?

**HONORS ONLY for the rest of the study guide:**

Phase Graph: Answer the following questions on the phase graph to the right: *(Note: B, D, F, and H are all the corners of the graph. A, C, E, G, and I are all the straight lines)*

* + - 1. Where is the substance ONLY a solid?
      2. Where is the substance ONLY a liquid?
      3. Where is the substance ONLY a gas?
      4. Where is the substance in transition between solid and liquid?
      5. Where is the substance in transition between liquid and gas?
      6. List every place on the graph where the substance is, either partially are completely, a liquid.?
      7. Could this be the phase graph for water (H2O)? Give evidence of your reasoning.

**Gas Laws:**

1. Helium gas in a balloon at 293 K occupies a volume of 1.2 L. What will be the volume of the balloon if the temperature of the balloon drops from 293 K to 275 K?

Law being used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quick Guess: Is volume going to increase or decrease? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FORMULA WORK ANSWER**

Given 1:\_\_\_\_\_\_\_\_\_\_

Given 2:\_\_\_\_\_\_\_\_\_\_

Given 3:\_\_\_\_\_\_\_\_\_\_

1. A sample of oxygen gas at 1.78 atm occupies 1.3 L. What will be its volume if the pressure drops to 0.68 atm?

Law being used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quick Guess: Is volume going to increase or decrease? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**FORMULA WORK ANSWER**

Given 1:\_\_\_\_\_\_\_\_\_\_

Given 2:\_\_\_\_\_\_\_\_\_\_

Given 3:\_\_\_\_\_\_\_\_\_\_