**Unit 1 Study Guide**

1. What is matter?
2. **List the 3 steps of the Kinetic Theory of Matter / Atomic Theory:**

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

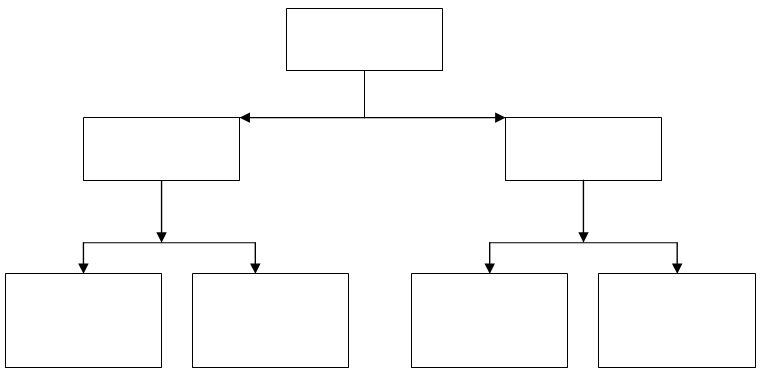
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Draw a picture**of what the particles of each state of matter would look like in the container | **Volume**:  Does this state of matter have a definite Volume? (Definite or Not Definite) | **Shape**:  Does this state of matter have a definite shape (Definite or Not Definite) | **Describe the movement of the particles.** (Slow? Fast? How do they move?) | **How closely are the particles packed?** (Close together? Spread apart?) |
| **Solid:** |  |  |  |  |
| **Liquid:** |  |  |  |  |
| **Gas:** |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase Change** | **Between what 2 states of matter?** | **What’s happening to the particles as they change from one state to another?** | **Example of Phase Change** |
| Condensation |  |  |  |
| Evaporation |  |  |  |
| Freezing |  |  |  |
| Melting |  |  |  |
| Sublimation |  |  |  |
| Deposition |  |  |  |

**Classification of matter:**



**Word Bank**: Mixtures, Compounds, Matter, Homogeneous, Element, Substance, Heterogeneous

1. \_\_\_\_\_\_\_\_\_\_\_\_ have only one type of matter and cannot be physically separated

2. \_\_\_\_\_\_\_\_\_\_\_\_ are made up of multiple things and the different parts are easily distinguishable.

3. \_\_\_\_\_\_\_\_\_\_\_\_ are two or more elements chemically bonded together.

4. \_\_\_\_\_\_\_\_\_\_\_\_ are made up of multiple types of matter and are classified based on how thoroughly blended they are.

5. \_\_\_\_\_\_\_\_\_\_\_\_ are defined as having all the atoms exactly the same. Cannot be broken down into smaller parts.

6. \_\_\_\_\_\_\_\_\_\_\_\_ contains multiple types of matter, but they are distributed evenly throughout.

**Chemical vs Physical Changes**

1. What is a physical property?
2. What is a physical change?
3. What are 3 signs that a physical change occurred?
4. What is a chemical property?
5. What is a chemical change?
6. What are 6 signs that a chemical change occurred?

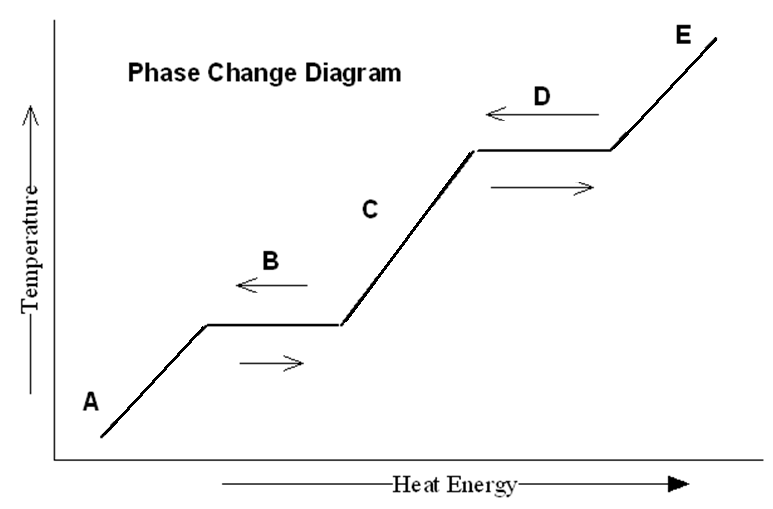
*Tell me if the following is a Physical or Chemical Change:*

1. Vinegar and baking soda volcano 10. Cutting a steak
2. Ice cream melting 11. Burning paper
3. Crushing a car at a junk yard 12. Rust forming

**Separating Mixtures:**

1. Do you separate an element by chemical or physical means?
2. Do you separate a compound by chemical or physical means?
3. Do you separate a heterogenous mixture by chemical or physical means?
4. Do you separate a homogenous mixture by chemical or physical means?
5. How can you separate salt water into salt and water?
6. How can you separate alcohol from water?

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

Phase Graph: Use the graph to the right for the following questions:

* + - 1. What is happening at point B?
      2. What is happening at point C?
      3. What is happening at point D?
      4. What is happening at point E?
      5. What does the horizontal line on the graph represent?
      6. When does the substance finally become entirely a liquid when it starts off as a solid?

**Gas Laws:**

1. If I am using Boyles law, what happens to pressure if I decrease the volume?
2. If I am using Charles law, what happens to the temperature if I increase the volume?
3. A sample of argon gas occupies 0.82 L at 1.34 atm. What will be its volume at 0.84 atm of pressure?

Law being used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **FORMULA WORK ANSWER**

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

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

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

1. A gas at 277 K occupies a volume of 0.76 L. At what temperature, in Kelvin, will the volume increase to 1.21 L?

Law being used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **FORMULA WORK ANSWER**

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

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

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

1. If it takes 0.25 L of nitrogen gas kept in a cylinder under pressure to fill an evacuated 3.5 L vessel in which the pressure is 0.8 atm, what was the initial pressure of the gas in the cylinder?

Law being used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **FORMULA WORK ANSWER**

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

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

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