**Matter and its Properties**

**What is matter? Use the following terms as part of your explanation: atom, molecule, element, volume and mass.**

**Sketch and Label Diagram:**

**Matter can undergo a Chemical Change**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ formed by the breaking or formation of new bonds between atoms. New substance has different properties than original substance – Must be chemical
* The change is \_\_\_\_\_\_\_\_\_\_\_\_
* There is a change in \_\_\_\_\_\_\_\_
* Gas bubbles are present
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are released
* A participate forms (solid)

Ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Matter can undergo a Physical Change**

* + No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ was created – Must be physical
  + The change can be reversed (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
  + The substance underwent a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ due to heating or cooling the substance (solid, liquid, gas)
  + The change is only in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The more characteristics of the above, the more likely the substances you are observing have gone through a physical change

Ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Try This:** Which of the following everyday activities are **physical changes (P)** and which are **chemical changes (c)**?

1. Burning leaves b. mixing sand with soil c. an iron nail rusts as it sits on the ground
2. using a glue gun e. a cake rises as it bakes f. a window cracks after a rock hits it on the road

**Describing Matter**

* Physical Properties – characteristics of matter that can be observed or measured table *p. 22 text*  
  **Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Qualitative Observations**

* + - The observation describes the look, smell, sound or feel of what is happening.
    - The observation does not involve \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_what is being observed.

Examples:

**Quantitative Observation:**

* + - The observation describes a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ made of what is happening
    - The observation involves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_what has been observed

Examples:

**Classify each of the following observations as Qualitative (Qual) or Quantitative (Quan)?**

* + 1. The bowling ball is heavier than the basketball\_\_\_\_\_\_\_\_\_\_\_\_
    2. John is 6 lbs heavier than Claire\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. The temperature increased by 5○C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    4. The colour changed from blue to green\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Matter Can be Classified as either a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Pure Substances –**a substance made up of only one kind of particle with the same properties throughout.

* + - **Element -** An element is a pure substance that consists entirely of \_\_\_\_\_\_\_type of atom. **An atom** is the smallest amount of a particular element that retains the properties of the element.

**Name 2 elements**

* + - **Molecule –** is a pure substance made of atoms that can either come from the same element or different elements in definite proportions

**Name 2 molecules**

* + - * + (made of one element)
        + (made of two or more elements)
    - **Compound -** a pure substance composed of at least two elements in definite proportions

**Name 2 compounds**



**Why are all compounds considered molecules but not all molecules are considered compounds?**

**Mixtures** – two or more pure substances mixed together in any proportions.

Example: salt water– ­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Try This:** Identify substance as either a pure substance (pure) or a mixture (Mix). If you know type of pure substance indicate this as well!

a. sodium chloride b. vinegar c . copper d. soup   
e. gasoline f. water g. nitrogen gas h. whipped cream

**What Physical States exist for matter?**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

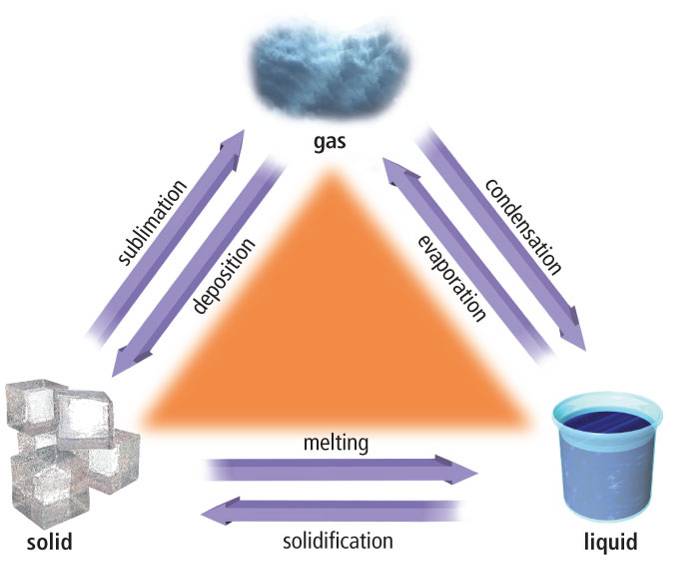
What causes substances to change Physical State?

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What two things happen to particles in a substance when the substance changes state?

**1)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Complete the diagram to show the appearance of the particles that make up each state of matter!**

**[](http://www.bcscience.com/bc9/pgs/videos_009_supercool.html)**

**Try This:** Mercury is a metal with a melting point of -39°C and a boiling point of 357°C.

What is its state at (solid, liquid, gas):

a. 0°C b. 500°C c. -1°C

***Read Bag of Change Lab!***