Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class Period \_\_\_\_\_\_\_

Matter and Atoms Study Guide

States of Matter:

**Solid Liquid Gas**

  

Particles are close together Particles have space to move Particles are far apart

Low Kinetic Energy Moderate Kinetic Energy High amount of Kinetic Energy

 [particles vibrate] [particles move and bounce off [particles are far apart]

 Of each other]

Definite volume Definite volume No volume

Definite shape Takes the shape of its container No shape

**Mass**: how much matter something contains. We commonly think of this as weight [but remember weight is the measure of gravitational force on an object].

 Ways to measure this: triple beam balance, scale, etc

 Units: grams

**Volume**: a measure of the amount of space something takes up.

 Ways to measure this: measuring cups for liquid volume, length x width x height calculations for regularly shaped solids, water displacement in a graduated cylinder for irregularly shaped solids [see picture to right for clarification on water displacement]

 Units: mL or cm3



**Density**: comparing Mass and Volume. This measure tells you how tightly atoms are packed into a certain amount of space.

 Ways to measure this: mass/volume calculations

 Units: g/cm3

 \*\*\* things that are less dense will float on top of things that are more dense

**The Law of Conservation**: the mass you end with is the same as the mass that you begin with

Ex 1) If you chemically change a log by burning it, the mass of the log and the mass of the ash remains the same

**Chemical Change Physical Change**

When you create a brand new substance When you change aspects of the substance

 without creating something new

Ex) burning wood Ex) changing the state

 Wood 🡪 ash H2O Water 🡪 ice

 These two substances are made up of Liquid 🡪 solid

Different elements

Ex) rust and oxidation Ex) Crushing rocks

**The Periodic Table**: a model used to determine the properties of elements

This is arranged in rows which are called **periods**. These organize elements based on energy level. Each row corresponds to the number of electron shells each element organizes its electrons in.

The columns are called **groups**. Groups identify elements that have similar properties based on their structure.

**Metals Nonmetals Metalloids**

Shiny Dull Shiny or dull

Malleable [can bend] Brittle [break if bended] Malleable [can bend]

Ductile [can be made into wire] Not Ductile [Can’t be wire] Ductile [can be made into wire]

Best conductor of heat Bad conductor of heat Ok conductor of heat

Best conductor of electricity Bad conductor of electricity Ok conductor of electricity

Often a solid Often a gas Often a solid

**Mixtures Elements and Compounds**

The physical combination of 2 or more The chemical joining of two or more elements

substances. to create a new substance

Heterogeneous – least mixed Written with two or more capital letters

Can be separated using physical means Can only be separated chemically

Ex) evaporation of water to leave A reaction must occur to break the

other materials behind bond that holds the molecule together

 Coffee filters

 Using a magnet