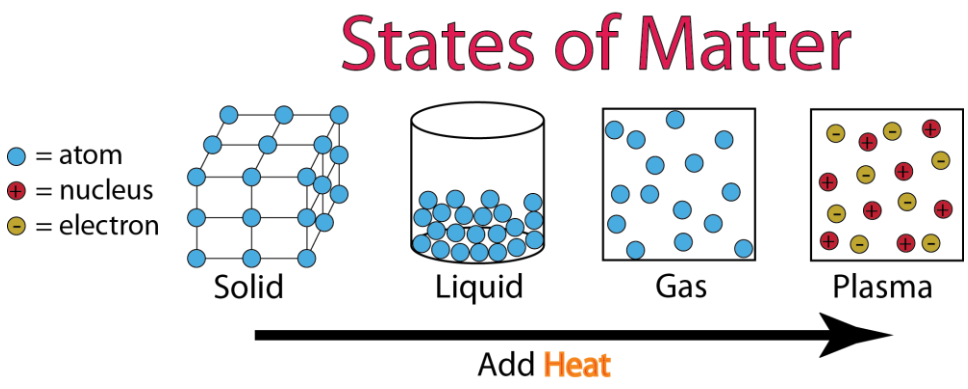
Matter and Its Properties Vocabulary

Skills Videos - http://mrsalbro.weebly.com/matter.html

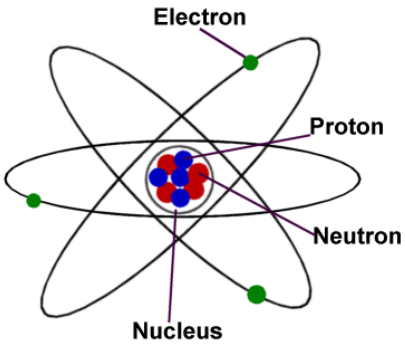
matter	Anything that has mass and takes up space.
mass	The measure of how much matter is in an object. **Note:** Weight is different from mass. Weight is the measure of the force of gravity on an object. The mass of an object will never change, but the weight of an item can change based on its location. For example, you may weigh 100 pounds on Earth, but in outer space you would be weightless. However, you will always have the same mass on Earth as you have in outer space.
volume	The amount of space an object takes up. • measured in milliliters (mL) and liters (L)
atoms	The smallest units of matter. Tiny particles that make up all matter. Atoms can only be seen with an extremely high-powered microscope.
molecules	When two or more atoms join together. • **element** – when two or more of the same atoms combine together. • **compounds** are two or more different elements combine together. Example: water H20 – two hydrogen atoms and one atom of oxygen
physical property	Anything that you can observe about an object by using one or more of your senses. Ex. color, texture, hardness, size, shape, volume, etc.
solid	The state of matter that has a definite shape and a definite volume. The molecules are tightly packed.
liquid	The state of matter that has a definite volume, but not a definite shape. It takes the shape of the container it is in, and the particles are loosely packed and slide past each other.
gas	The state of matter that does NOT have a definite shape or volume and fills a container. Its molecules are very loose and spread out.
plasma **(a 4th state of matter)**	Plasma is an electrically charged gas. stars, lightning, the Northern Lights, fluorescent light bulbs
evaporation	When a liquid becomes a gas.
condensation	When a gas changes into a liquid. When cool air turns water vapor back into a liquid.
precipitation	The liquid and solid water particles that fall from clouds. Ex. Rain, snow, hail, sleet, mist.
temperature	The measure of how hot or cold something is.
energy	The ability to do work. Work is defined as the transfer of energy.
heat	The movement of thermal energy. Heat moves from warmer objects to cooler objects.
displace	To move a substance to make room for another.

Unit 3: Properties of Matter and States of Matter
What should my student be able to do if they master this standard?
Read the temperature on a thermometer in both Celsius and Fahrenheit to measure heat energy.
Measure and compare temperatures of various samples of solids and liquids using a thermometer (Celsius and Fahrenheit).
Investigate mass and volume as measurable properties of matter.
Match appropriate tools and units of measure associated with mass and volume.
Measure mass and volume of solids and liquids using appropriate tools.
Measure the volume of solids (e.g., rock, shell, marble, pencil, etc.) using the water displacement method.
Compare the mass and volume of different solids and liquids as measured by the same group of students (e.g., the marble displaced more water than the penny – the rock has a greater volume than the marble).
Compare measurements of solids and liquids made by different groups using the same tools and seek reasons to explain the differences across the groups.
Explain that two objects of the same volume may have different masses.
Identify physical properties of matter (observable and measurable) used to describe objects (e.g., size, shape, color, texture, hardness, length, weight, temperature).
Classify objects according to similar properties.
Compare the physical properties of matter (e.g., size, shape, color, texture, hardness).
Review the three states of matter (solid, liquid, gas).
Review the properties for each state of matter (e.g. a gas fills its container, a liquid takes the shape of its container, and a solid keeps its shape).
Investigate melting, freezing, boiling, evaporation, and condensation of water.
Infer based on observations made during the water investigations (e.g., an increase or decrease in heat energy is needed to bring about a change of state).
Describe how water changes its state through heating and cooling (e.g., condensation occurs when water vapor loses heat, so it will then change from a gas to a liquid).

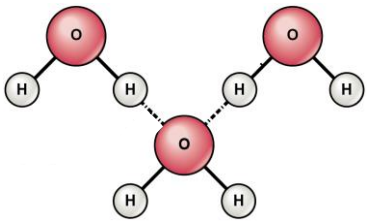
Freezing Point of Water	Boiling Point of Water
0° C	100° C
32° F	212° F



Mater can change from one phase to another with the addition or removal of heat energy. Matter changing from one state to another is a physical change.		
evaporation	**Liquid → Gas** • water changes into a gas called water vapor • heat energy is added • particles move faster and faster Examples include: a puddle disappearing, boiling water and clothes drying	
condensation	**Gas → Liquid** • water vapor turns into droplets of liquid water • heat energy is removed • particles slow down Examples include: morning dew and a foggy mirror after a hot shower	
freezing	**Liquid → Solid** • liquid water turns to ice • heat energy is removed • particles slow down Examples include: rain turning into hail and juice freezing into a popsicle	
melting	**Solid → Liquid** • ice turns into liquid water • heat energy is added • particles move faster Examples include: a snowman thawing out and wax dripping down a candle.	



atoms	The smallest units of matter. Tiny particles that make up all matter. Atoms can only be seen with an extremely high-powered microscope.
nucleus	The center of an atom that contains the protons and neutrons.
proton	Positively charged particle. Found in the nucleus.
neutron	Atomic particle that has no charge. Found in the nucleus.
electron	Negatively charged particle that spins around the "shell" of an atom.



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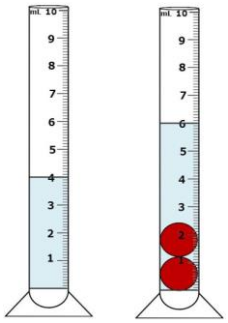
Displacement Method for Measuring Volume

Step 1	Add water to a measuring container such as a graduated cylinder. Record the volume of the water.
Step 2	Place the object in the water in the graduated cylinder. Measure the volume of the water with the object in it.
Step 3	Subtract the first volume from the second volume. The difference represents the volume of the object.



Beginning Level: 4 mL

Level w/Object: 6 mL

6 mL – 4 mL = 2 mL

The volume of two marbles is 2 mL

Physical Change	Chemical Change
Matter changes shape or form, but the molecular structure remains unchanged. Pressure, changes in temperature, and the transfer of energy can all result in a physical change. Many physical changes can be undone.	Matter changes on a molecular level and results in a new chemical substance. Chemical changes involve breaking bonds between atoms. Chemical changes cannot be undone.
Changes of State • melting • freezing • boiling • condensation • evaporation **Examples:** • melting ice • chopping wood • cutting a sheet of paper • shaping modeling clay • mixing trail mix	**Examples:** • digestion • rusting • decomposition • burning wood • rotting fruit • cooking an egg • baking a cake • gasoline fueling a car (combustion) • fireworks • photosynthesis **Chemical reactions usually create:** • gives off heat (exothermic) • bubbles (gas) • fire • change in color • odor • light is given off