**State Standards**

* 6.2.1.1 - 1. Pure substances can be identified by properties which are independent of the sample of the substance and the properties can be explained by a model of matter that is composed of small particles.
* 6.2.1.2 - 2. Substances can undergo physical changes which do not change the composition or the total mass of the substance in a closed system.
* 6.2.2.2 - 2. Forces have magnitude and direction and govern the motion of objects.

**MN Benchmarks/Local Standards**

* 6.2.1.1.1 - Explain density, dissolving, compression, diffusion and thermal expansion using the particle model of matter.
* 6.2.1.2.1 - Identify evidence of physical changes, including changing phase or shape, and dissolving in other materials.
* 6.2.1.2.2 - Describe how mass is conserved during a physical change in a closed system.For example: The mass of an ice cube does not change when it melts.
* 6.2.1.2.3 - Use the relationship between heat and the motion and arrangement of particles in solids, liquids and gases to explain melting, freezing, condensation and evaporation.
* 6.2.2.2.4 - Distinguish between mass and weight.

**Essential Questions**

* + How are the properties of matter related to the state of matter?
	+ How do atoms relate to the properties and state of matter?

**Instructional Details**

**Content**

* + The structure of the atom and the nature of subatomic particles: understand the basic properties of protons, neutrons, and electrons
	+ The characteristic properties of substances and the tests that define them.
	+ Physical properties and physical changes in solids
	+ Physical properties and physical changes in liquids
	+ That substances can exist in different states-solids, liquid, and gas- and that substances can change from one state  to another by heating and cooling.
	+ What components are related to density and the equation to calculate density.
	+ The comparisions between a mixture, solution, and suspension.
	+ How spacing of particles affects density
	+ Physical changes in terms of mass before and after a change
	+ When an object's shape changes, its mass remains constant
	+ The mass of an object is the same as the mass of the sum of the pieces of that object
* **Skills**
	+ Delta Science - Matter and Change: Activity 4 Atomic Structure
	+ calculate the number of protrons, nuetrons, and electrons in an atom, given its atomic number.
	+ interpret information on the periodic table.
	+ construct model atoms
	+ Delta Science - Matter and Change: Activity 1 The Density of Liquids
	+ measure the mass and volume of 3 liquids in order to determine their densities
	+ relate the density of a liquid to its ability to keep an object afloat
	+ observe that density can vary among liquids that appear to be similar
	+ Delta Science - Matter and Change: Activity 3 Solutions and Suspensions
	+ differentiate between solutions, suspections; heterogeneous and homogeneous mixtures.
	+ separate a suspended material from a solution
	+ separate a solute from water
	+ Delta Science - Activity 2 Pressure and Volume of a Gas
	+ explain common phenomena using the particle model of matter (ie. expansion, contraction)

Vocabulary

* + density
	+ dissolving
	+ compression
	+ diffusion
	+ thermal expansion
	+ particles
	+ phase change
	+ physical changes: melting, freezing, condensation, evaporation
	+ matter
	+ density
	+ mass (m)
	+ volume (vol)
	+ metric units (K, H, D, u, d, c, m)
	+ evaporation
	+ heterogeneous
	+ homogeneous
	+ solute
	+ solution
	+ solvent
	+ supension
	+ atom
	+ electron
	+ proton
	+ neutron
	+ nucleus
	+ periodic table
	+ molecule
	+ covalent bond
	+ chemical equation
	+ diffusion
	+ thermal expansion
	+ particle
	+ physical changes
	+ chemical changes
	+ solids
	+ liquids
	+ gases
	+ melting
	+ freezing
	+ condensation
	+ evaporation