DESCRIPTION OF MATTER (mass and occupies space) **Chp 1.1 & 1.2**

<table>
<tr><td>PURE (always homogeneous)</td><td colspan="2">MIXTURE (impure)</td></tr>
<tr><td>Elements – all atoms are the same

Represented by symbols of one element

Compounds – made from two or more elements

Represented by symbols of two or more elements</td><td>homogeneous
(uniform throughout – composition/properties)
<table><tr><td>brass</td><td>sugar dissolved in water</td></tr><tr><td>air</td><td>tap water</td></tr></table></td><td>heterogeneous
(not uniform composition/properties)
<table><tr><td>granite</td><td>fog (air water)</td></tr><tr><td>dirt</td><td>fresh squeezed lemonade (pulp in it)</td></tr></table></td></tr>
</table>

STATES OF MATTER - gas, liquid, solid **Chp 1.4**

TRANSFORMATION of matter **Chp 1.6**

<u>Physical – phase change</u>	<u>Chemical- transformation to new substance(s)</u>
ice melting	Hydrogen reacting with oxygen to produce water
grinding coffee beans	Hydrogen peroxide decomposing to water and oxygen

PROPERTIES of matter **Chp 1.6**

<u>Physical (*detected using the senses*)</u>:	<u>Chemical (*stability*)</u>:
Boiling point	Reactivity with oxygen
Melting point	Stability in air
Shape	Heat stability
Color	

HOW ARE PROPERTIES AND TRANSFORMATION OF MATTER STUDIED?

- HYPOTHESIS – TENTATIVE EXPLANATION OF AN OBSERVATION THAT CAN BE VERIFIED BY EXPERIMENT. *Experiments must be conducted under carefully controlled conditions so that they can be reproduced over and over. This separates science from pseudo science.*

- THEORY – AN EXPLANATION OF AN OBSERVATION THAT IS SUPPORTED BY EXPERIMENTAL DATA AND WHICH IS USED TO PREDICT OTHER OBSERVATIONS. PHYSICAL OR MATHEMATICAL MODELS ARE FREQUENTLY DERIVED FROM A THEORY. *At any time, a new experiment may be done that invalidates the theory.*

- LAW – A STATEMENT OF OBSERVATION OF A NATURAL PHENOMENA (Law of Conservation of Mass - "The total mass of reactants is equal to the total mass of products in a chemical reaction.") *Laws do not ever change because they are based on observations of natural phenomena.*