Elements, Compounds, & Mixtures Reference Sheet

1. **Pure Substance** – a sample of matter that has definite chemical & physical properties.
2. **Element** – pure substance that cannot be separated into simpler substance by physical or chemical means.
3. **Atoms** - The smallest unit of an element that maintains the properties of that element.
4. **Molecules** – composed of two or more elements that are joined by chemical bonds
   a. Elements can be the same: Ex: H₂, O₂, N₂
   b. Elements can be different: Ex: C₆H₁₂O₆, H₂O
5. **Compounds** – pure substance composed of two or more different elements joined by chemical bonds.
   a. Made of elements in a specific ratio that is always the same
      i. Water is H₂O – It will always will have 2 hydrogen atoms and 1 oxygen atom joined together
   b. Can only be separated by chemical means, not physically
   c. Have their own physical and chemical properties
   d. Chemical and physical properties are different than the elements they are made from
      i. Example H₂O Hydrogen is a gas Oxygen is a gas Water is a liquid at room temperature
6. **Mixtures** – a combination of two or more pure substances that are not chemically combined. Substances held together by physical forces, not chemical
   a. No chemical change takes place
   b. Each item retains its properties in the mixture
   c. They can be separated physically
7. **Types of Mixtures** – There are two main categories
   a. **Homogeneous** – molecules are mixed up in an even distribution
      i. **Solutions** – a mixture that appears to be a single substance
      ii. **Solute** – the substance being dissolved
      iii. **Solvent** – the substance in which the solute is being dissolved Water is considered a universal solvent
      iv. Do not settle out over time
   b. **Heterogeneous** - molecules are not mixed up in an even distribution
      i. **Suspensions** – a mixture in which particles will eventually settle out

Write the answers to the activity in the spaces below:

<table>
<thead>
<tr>
<th>Elements</th>
<th>Compounds</th>
<th>Mixtures</th>
</tr>
</thead>
<tbody>
<tr>
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Liz LaRosa [www.middleschoolscience.com](http://www.middleschoolscience.com) 2009-2016
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Word Bank - Place the following words into the flowchart above

<table>
<thead>
<tr>
<th>Element</th>
<th>Homogeneous</th>
<th>Mixture</th>
<th>Matter</th>
<th>Compound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure Substance</td>
<td>Heterogeneous</td>
<td>H₂O</td>
<td>O₂</td>
<td>Lemonade</td>
</tr>
<tr>
<td>Snow Globe</td>
<td>Gelatin</td>
<td>CO₂</td>
<td>Kool-Aid</td>
<td>H₂</td>
</tr>
</tbody>
</table>