

Summer Review Sheet #1

States of matter, elements, compounds, mixtures

Answers are provided on the second sheet. Please try to do the worksheet without referring to them, because you'll be expected to know this stuff the first day of school!

- 1) List the three states of matter and describe their basic properties:
 - **Solid: The molecules/atoms are locked rigidly in place. Solids are generally hard, brittle, cannot be compressed, do not conform to match the shape of the container they are stored in, and have fixed volume.**
 - **Liquid: The molecules/atoms are held loosely with intermolecular forces, but can generally move freely. Liquids have no fixed shape but do have fixed volume, conform to match the shape of a container they are placed in, are not hard, and are incompressible.**
 - **Gas: The molecules/atoms are essentially independent of one another and can move completely freely throughout the container. Gases have no fixed shape or volume and can expand to fill whatever container they are placed in. Gases have very low density and are highly compressible.**

- 2) Classify the following as either elements, compounds, homogeneous mixtures (solutions) or heterogeneous mixtures:
 - a) copper (II) sulfate **compound**
 - b) Kool Aid **homogeneous mixture**
 - c) wood **heterogeneous mixture**
 - d) plastic **homogeneous mixture**
 - e) lined paper **heterogeneous mixture**
 - f) gadolinium **element**

- 3) Why are homogeneous mixtures more difficult to separate than heterogeneous mixtures?

The components in a heterogeneous mixture are generally (though not always) easy to determine, making it easy to pull them apart, or at least devise a way to do so.

- 4) Why can't elements be separated into smaller parts using chemical means?

Too much energy is required, since you'd have to break them down into protons, neutrons, and electrons. You can get this much energy together with nuclear reactions, but not by chemical means.