



1) What are the three states of matter? Describe their basic properties.  
**Solid: definite volume and shape, no matter what container it is placed in. Cannot be compressed.**

**Liquid: definite volume but indefinite shape that conforms to the shape of its container. Difficult to compress.**

**Gas: indefinite volume and shape. Gases will expand to fit and fill their container or can be compressed to fit their container.**

2) Are the following elements, compounds, homogeneous mixtures or heterogeneous mixtures?

a) plastic                    **homogeneous mixture**

b) platinum                **element**

c) concrete                **heterogeneous mixture**

d) mayonnaise            **homogeneous mixture**

e) seawater                **heterogeneous mixture**

f) glucose                **compound**

3) Are the following processes chemical or physical properties?

a) oxygen and hydrogen react to form water                    **chemical**

b) hydrogen boils at  $-253\text{ }^{\circ}\text{C}$     **physical**

c) nitrogen dissolved in water    **physical**

d) oxygen and nitrogen react to form nitrogen oxide            **chemical**

4) Can elements be separated into smaller parts using chemical means? Why or why not?

**No, elements cannot be separated into protons, neutrons, and electrons by chemical means because the energy needed to do this is more than can be produced by chemical means. Also, elements cannot be created by combining simpler particles.**