Analysis Questions

Directions: Look at the three areas labeled ***Element*** and answer the following questions…

1. What do the three areas have in common?

Each area has single type of "marshmallow" or atom.

2. Define the term ***element*** from your reasoning above.

Elements are substances that are made up of only one type of atom.

3. What other elements can you make with your marshmallows?

Na - Sodium
Cl - Chlorine

Directions: Look at the two areas labeled **Compounds** and answer the following questions.

4. What two things do the area contents have in common?

Each area has two different types of elements.
Each area has "bonds" holding the elements together.
Ratios of elements are the same in each "set" --- the number of colored marshmallows does not change in each small group.
**Each compound can only be separated by breaking the bonds (chemical means).*

5. Define the term ***compound*** from your reasoning above.

Compounds are two or more elements bonded together with the same ratio of elements in each part.

6. What other compounds can you make with your marshmallows? Are these compounds found in nature?

CO - Carbon Monoxide *CO_2 - Carbon Dioxide* *$C_6H_{12}O_6$ - Fructose* **Answers may vary here --- the above are common compounds found in nature.*	*HCl - Hydrochloric Acid* *NaOH - Sodium Hydroxide* *$NaHCO_3$ - Baking Soda* *H_2O_2 - Hydrogen Peroxide*

Directions: Look at the two areas labeled **Mixtures** and answer the following questions.

7. What do the areas contents have in common?

Each area has two or more different types of elements or compounds.
Each area has "bonds" holding some of the elements together but not all of the parts are bonded together.
**Each mixture can be separated by moving them apart (physical means).*

8. Define the term ***mixture*** from your reasoning above.

A mixture is a combination of two or more elements or compounds physically intermingled (mixed).

9. What other mixtures can you make with your marshmallows? Are these mixtures found in nature?

$H_2O + CO_2$ - Carbonated water
$C_6H_{12}O_6 + H_2O$ - Sugar water

**Answers may vary here --- the above are common mixtures found in nature.*

10. In your own words, what is the difference between elements, compounds, and mixtures? Use complete sentences.

Elements, compounds, and mixtures are ways to classify matter. Elements are the simplest form with only one type of atom. Compounds are elements that are bonded together in a specific way or ratio. These can only be broken apart by chemical means. Mixtures are the most complex form because they can have elements and compounds intermingling together. Mixtures can be separated by physical means. All matter can be categorized into one of the three groups, elements, compounds, or mixtures.

Extension

11. Explain the analogy: An element is to a compound as a letter is to a word.

Elements make up compounds. They connect together to form a "bonded" substance. This is like letters in a word. Letter "bond" together to form a word. The word has different properties than the letters that make it up.

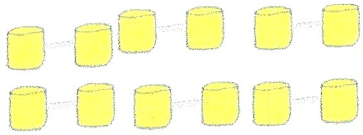
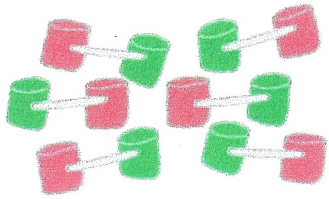
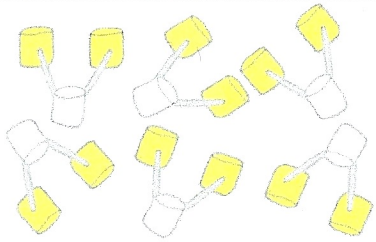
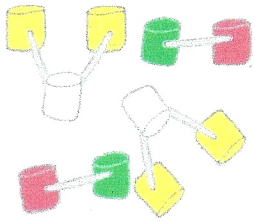
12. Complete your own analogy:

Elements and compounds are to mixtures as

- *letter and words are to sentences.*
- *lumber and houses are to neighborhoods.*
- *cells and organs are to an organism.*

DRAW & LABEL

Directions: Draw and label what you see in each area in the order you built them. You must use colored pencils to color the marshmallows the correct color.

#	Label	Draw
1.	***O_2 Element.***	
2.	***H_2 Element***	
3.	***C Element.***	
4.	***Salt (NaCl) Compound.***	
5.	***Water (H_2O) Compound.***	
6.	***Salt Water (H_2O + NaCl) Mixture .***	
7.	***Dissolved Oxygen (H_2O + O_2) Mixture***