COMPARING ELEMENTS, COMPOUNDS, MIXTURES AND SOLUTIONS

One of the trickiest parts of understanding matter is understanding the differences between elements, compounds, mixtures and solutions. Your job today is to work together to study these terms. By the end of our class period, you should be able to explain each term accurately to someone who wasn't in our class.

STEP 1: DEFINING ELEMENTS, COMPOUNDS AND MIXTURES

Find at least three different definitions. Decide on the definition that is the easiest to understand. Include it in the table below. Include a link to the source where you found your definition.

Element	**Compound**	**Mixture** *(heterogeneous AND homogeneous)*

STEP 2: BRAINSTORMING A METAPHOR

Create a list of at least three different potential metaphors for each term. Remember that a metaphor is a comparison between two unlike things. **Example: A mixture is like a child's toy box**.

Element	**Compound**	**Mixture**

STEP 3: SELECTING A METAPHOR

Together, decide on the BEST metaphor for each of the terms that we are studying. Then, explain both the strengths and weaknesses of the metaphor. What part(s) of the science concept does it represent well? What part(s) of the science concept does it struggle to represent? ***Insert a picture that you can use for evidence.***

Element	**Compound**	**Mixture**
The science concept that this metaphor represents well is:	The science concept that this metaphor represents well is:	The science concept that this metaphor represents well is:
The science concept that this metaphor DOESN'T represent well is:	The science concept that this metaphor DOESN'T represent well is:	The science concept that this metaphor DOESN'T represent well is:
Insert a picture here:	Insert a picture here:	Insert a picture here:

STEP 4: DEFINING SOLUTIONS

Now, we are going to work with solutions. Start by using the internet to find easy-to-understand definitions of the following terms:

Term	*Definition*
Solution	
Solvent	
Solute	
Dissolve	

Answer the following question:

Is a solution a compound or a mixture? Explain your thinking	

STEP 5: WORKING WITH SOLUTIONS: Follow the steps below to create a solution of salt water.

1. Fill a beaker with 100 ml of room temperature water.
2. Record the mass, volume and density of the water.
3. Fill a second beaker with 8 even spoonfuls of table salt.
4. Record the mass, volume and density of the table salt.
5. Slowly pour about 1/4 of the table salt into the room temperature water. Mix the salt and water together. Record -- either in writing, in pictures, or both -- what you see happening.
6. Repeat step 5 until you have added all of the salt to your water.
7. Record the mass, volume and density of the salt water solution.

Data Table #1: Measurements to record BEFORE salt is added to water.

Object to Measure	**Mass** (Beginning of Experiment)	**Volume** (Beginning of Experiment)	**Density** (Beginning of Experiment)
Beaker of Room Temperature Water			
Beaker of Eight Even Spoonfuls of Table Salt			

Observations: Can be written descriptions of what you see OR drawings OR photos that you take.

After adding 1/4 of your salt:	After adding 1/2 of your salt:	After adding all of your salt:

Data Table #2: Measurements to record AFTER salt is added to water.

Object to Measure	Mass (End of Experiment)	Volume (End of Experiment)	Density (End of Experiment)
Beaker of Room Temperature Water after 8 Even Spoonfuls of Salt have been added			

ANALYSIS: Answer the following questions to reflect on what you learned during this experiment.

What do you notice about the mass, volume and density of the water AFTER you added your 8 spoonfuls of salt? Did it change in an expected way? In an unexpected way? Explain your thinking.	
What happened to the salt that you added to the water? Did it disappear? Has it been destroyed? How could you prove that your theory is correct?	
How do you think your results would change if we dissolved salt into boiling water? Freezing water? Explain your thinking.	