Chemistry Unit - Review of Major Concepts

Balancing Chemical Equations -

1) How many atoms of each element are in the compound $Fe(OH)_3$?
    a) # of Fe atoms **1**
    b) # of O atoms **3**
    c) # of H atoms **3**
2) Balance the following chemical equation - *Remember if unbalanced you have to change coefficients (#'s in front) to balance it.*
    a) **1** $FeCl_3$ + **3** NaOH → **1** $Fe(OH)_3$ + **3** NaCl What does the Law of Conservation of Mass state?

    That matter can neither be created nor destroyed it can ONLY be rearranged.
3) How does the Law of Conservation of Mass apply to chemical equations? *Think of what balanced and unbalanced mean*

    Chemical Equations that are balanced have the same number of atoms of each element on each side. So NaCl → NaCl . Both sides have the same number of Na's and Cl's.

Chemical Change vs Physical Changes -

1) List three examples of physical changes -

    Freezing Water / Tearing Paper / Mixing Paint - Those elements retained the same properties after the action.
2) List AND explain three PHYSICAL properties -
    a) **Boiling Point - Temperature at which liquid becomes gas.**
    b) **Density - Mass/Volume - In a given space, how much matter is in something.**
    c) **Melting Point - Temperature at which solid becomes a liquid.**
3) List three examples of chemical changes -

    Rust (oxidation) / Roasting a marshmallow / Burning Wood / Baking a Cake / Mixing baking soda and vinegar
4) List AND explain three CHEMICAL properties -
    a) **Oxidation** - **Oxygen reacts with metal to form rust.**
    b) **Combustibility - How likely something is to explode.**
    c) **Flammability - How likely something is to catch fire.**
5) What is the easiest way to tell if something is a physical or chemical change? *hint - think about making a cake*

    If you can reverse the change, it's physical, it you cannot, it's chemical. If something new is created, it's chemical.

Periodic Table -

1) Who came up with the idea of the periodic table? How did they come up with the idea? In other words what pattern did they observe that led to the formation of the periodic table? **Dmitriv Mendeleev. He realized that physical and chemical properties of atoms were related to atomic mass. - Related to Atomic Number - # of protons.**
2) How are elements organized in the periodic table? What is the pattern? **In order of increasing atomic number - number of protons. Number of protons determines chemical and physical properties.**
3) Where are the most reactive elements located? Why are they the most reactive and WHAT are they called? **On the far left. Because their valence electron shells are missing only 1 electron. They easily react by giving up or taking on one electron. Alkali metals.**
4) Where are the noble gases located on the periodic table? **Far right.**
5) What physical and chemical properties do they share? **Non-reactive because their valence electron shells are full. They don't want any electrons. Gas at room temperature.**
6) Elements belong to vertical columns labeled as Groups or Families. What do these groups or families have in common? In other words, elements in a vertical column are similar in what way? **Same number of missing electrons in their valence electron shell. Similar reactivity. Similar physical and chemical properties.**
7) What are the three basic parts of an atom? Draw and label a diagram **Protons - Positively charged in the nucleus. Neutrons - No charge in the nucleus. Electrons - orbit around the nucleus with a negative charge.**

Mixtures vs. Compounds -

1) What is a mixture? Give an example -
2) **A physical combination of two or more substances - Green and Blue paint mixing, a salad. Air is actually a mixture.**
3) What is a compound? Give an example (make sure to give the chemical formula for that example. *Sodium is NaCl) **Two or more elements chemically combined. Two or more compounds chemically combined. CaBr.**
4) What is the difference between a mixture and a compound? *Think of how they are separated* **Mixture can be physically separated, while a compound has to be chemically separated.**