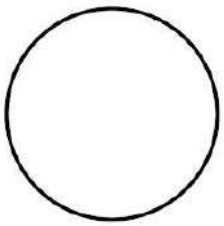
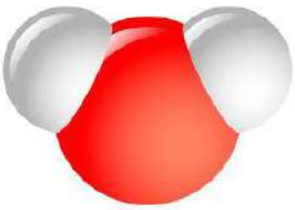
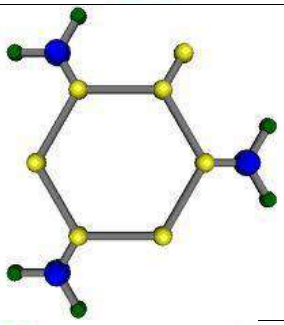
Chemistry Unit Test #1 Review 2012-2013

Name:_____

Answer the following questions by circling the correct choice.

1. Which subatomic particle is located in orbits around the nucleus of an atom?
    a. Protons
    b. Neutrons
    c. Electrons
    d. Gluons

2. Which of the following represents an atom?

a.	
b.	
c.	
d.	

3. Which of the following is a chemical property?
    a. Malleable
    b. Inert
    c. Ductile
    d. Density

4. Making lemonade is an example of
    a. A physical property
    b. A physical change
    c. A chemical property
    d. A chemical change

5. Which of the following is a chemical change?
    a. Chewing your food.
    b. Digesting your food.
    c. Refrigerating your food.
    d. Cutting your food.

6. Baking a cake is an example of
    a. A physical property
    b. A physical change
    c. A chemical property
    d. A chemical change

7. Which of the following is a physical change?
    a. A nail rusting.
    b. A lump of sodium reacting with water.
    c. Solubility.
    d. Painting your toenails.

Use the attached Periodic Table of the Elements to answer the following questions.

Symbol	Name	Atomic #	#Protons	#Neutrons	#Electrons	Mass	Charge
Si	8.	9.	10.	11.	12.	13.	0
14.	15.	16.	9	17.	18.	19	-1
Mg^{+2}	19.	20.	21.	12	22.	23.	24.
25.	Copper	26.	27.	28.	29.	64	+2
30.	31.	94	32.	33.	34.	238	0
35.	36.	37.	38.	121	79	39.	+1

Label the following compounds as ionic or covalent.

40. NaCl _____

41. CO_2 _____

42. H_2O _____

43. Fe_2O_3 _____

44. P_2O_5 _____

45. Cr_2O_3 _____

Essay Question (10 Points) ***<u>One of the topics below will appear on the test.</u>***

Explain the difference between metals and nonmetals including their placement on the Periodic Table of the Elements.

Explain the difference between elements in a Group and elements in a Period on the Periodic Table of the Elements.

Explain how the number of valence electrons dictates which charge an atom will take when it becomes an ion.

Answers and Explanations

1. The correct answer is C. Electrons orbit the nucleus of the atom which contains the protons and neutrons.

2. The correct answer is A. Atoms are represented as single things; a circle in this case. Choices B & C are both molecules. Choice D is obviously a clown. I couldn't think of a fourth thing that wouldn't look like the others so I went with a joke.

3. The correct answer is B. Inert mean nonreactive. Chemical properties describe the "behavior" of substances similar to the personality of a person. Physical properties describe things that can be measured or that you use your senses on. Malleable means easily shaped and ductile means able to be pulled into wire. Both are physical. Density is a measure of how much mass is in a given volume. Again, this is physical.

4. The correct answer is B. Physical changes occur when the substances you start with are the exact substances you end up with. Chemical changes happen when you start with a substance and end up with a new one after the change occurs. With lemonade, you have the same sugar, water, citric acid, etc. before and after the mixing. They don't become something new even if we call it something different. Chemically they are still the same as before.

5. The correct answer is choice B. Chewing, refrigerating or cutting food only changes on thing about the food (size or temperature depending on the choice). Digesting the food changes it from the food to something entirely new afterwards.

6. The correct answer is D. If you examine the properties of cake batter and the cake after baking there is a whole list of properties that are different. When you have a lot of differences this is due to the chemicals being different.

7. The correct answer is choice D. Painting your toenails does not change the toenail outside of coating it in polish.

#8-39 can be found using information in the students notes about the Periodic Table, ions and isotopes. Students have completed several practice pages of similar problems. If they have issues, please have them come to me for help if you are unable to help them.

Symbol	Name	Atomic #	#Protons	#Neutrons	#Electrons	Mass	Charge
Si	8. Silicon	9. 14	10. 14	11. 14	12. 14	13. 28	0
14. F^{-1}	15. Fluorine	16. 9	9	17. 10	18. 10	19	-1
Mg^{+2}	19. Magnesium	20. 12	21. 12	12	22. 10	23. 24	24. +2
25. Cu^{+2}	Copper	26. 29	27. 29	28. 35	29. 27	64	+2
30. Pu	31. Plutonium	94	32. 94	33. 144	34. 94	238	0
35. Hg^{+1}	36. Mercury	37. 80	38. 80	121	79	39. 201	+1

Ionic bonds are the bonds between metals and nonmetals.

Covalent bonds are bonds between nonmetals and other nonmetals.

40. Ionic Bond. Sodium (Na) is a metal and Chlorine (Cl) is a nonmetal.

41. Covalent bond. Both Carbon (C) and Oxygen (O) are nonmetals.
42. Covalent bond. Both Hydrogen and Oxygen are nonmetals.
43. Ionic Bond. Iron is a metal while Oxygen is a nonmetal.
44. Covalent Bond. Phosphorous and Oxygen are nonmetals.
45. Ionic Bond. Chromium is a metal. Oxygen is a nonmetal.

Essay questions. Only one will be on the test.

1. Metals tend to be malleable, shiny, and are excellent conductors. They are on the left of the "stair step" on the Periodic Table. Non-metals are usually dull, brittle, and very poor conductors. They are to the right of the "stair step" on the Periodic Table. The "stair step" is formed by Boron, Silicon, Germanium, Arsenic, Antimony, Tellurium and Polonium.

2. Elements in a group have very similar, though not exact, properties. They have the same number of valence electrons which means they react in a similar way as well. They can be compared to members of a family and sometimes a group is even called a Family. Elements in a Period may or may not share properties. They can be compared to students in the same class period at school.

3. Valence electrons are the electrons that are in the outermost shell of an atom. This means they are the ones available to form bonds. The Octet Rule says that atoms will try to get either zero or eight in the outermost shell so that the shell is full in a way similar to the Noble Gases. Electrons are either gained or lost by atoms to reach this goal of zero or eight depending on which is easiest to reach. Elements in group 1, for example, find it easier to lose the one valence electron they have to reach zero. Elements is group 17, on the other hand, have 7 valence electrons and find it easier to just find and "take" the one electron they need to get to 8. Normally the number of electrons (negatively charged particles) and

protons (positively charged particles) are equal. When the atom gains or loses electrons to meet the Octet Rule, this creates an imbalance in the numbers and thus an ion is generated. If there are more electrons than protons you wind up with an anion (negatively charged atom). If there are fewer electrons than protons you wind up with a cation (positively charged atom). How many electrons are gained are lost tell you the number that goes with the charge.