Name_____ **Unit 5: Bonding** **I Can Statements**

____1. I can state the three types of chemical bonds.	The three types of chemical bonds are: _____, _____, and _____.
____2. I can state the number of valence electrons that an atom attains to be most stable.	Atoms are most stable when they have _____ valence electrons.
____3. I can state the two types of compounds.	The two types of compounds are _____ and _____.
____4. I can define ionic bond, covalent bond, and metallic bond in terms of the types of elements (metals, nonmetals) from which they are formed.	**Definition:** ionic bond covalent bond metallic bond
____5. I can define ionic and covalent bonds based on what happens to the valence electrons.	**Definition:** In an ionic bond, the valence electrons of the _____are _____ to the _____ so that each atom attains a stable octet (like noble gases). In a covalent bond, the valence electrons of the two _____ are _____ so that each atom attains a stable octet (like noble gases).
____6. I can explain TICS as it relates to chemical bonding.	TICS stands for _____. It helps me remember what happens to the electrons in each type of bond.
____7. In terms of valence electrons, I can find similarities and differences between the bonding in several substances.	Explain, in terms of valence electrons, why the bonding in methane (CH_4) is similar to the bonding in water (H_2O) ..... Explain, in terms of valence electrons, why the bonding in HCl is different than that bonding in NaCl.

____8. I can draw a Lewis dot diagram to represent an ionic compound.	Draw Lewis dot diagrams for the following ionic compounds. LiBr $CaCl_2$
____9. I can draw a Lewis dot diagram to represent a molecular (covalently bonded) compound.	Draw Lewis dot diagrams for the following molecular substances. H_2O CO_2 I_2 CH_4
____ 10. I can state the number of electrons that are shared in single and multiple covalent bonds.	In a single covalent bond, __________ electrons are shared. In a double covalent bond, __________ electrons are shared. In a triple covalent bond, __________ electrons are shared.
____12. I can state the type of bonding that occurs in the polyatomic ions (Reference Table E) and explain why they have that type of bonding.	Polyatomic ions have ____________________ bonding because ____.
____13. Given the chemical formula for a compound, I can determine the type(s) of bonding in the compound.	State the type(s) of bonding in the following compounds: NaCl_________________ CO________________ Hg_________________ Na_3PO_4___________&________________
____ 14. I can explain and apply the meaning of BARF as is applies to chemical bonding.	BARF stands for ____ This means that when a bond is FORMED, energy is _________________ and when a bond is BROKEN, energy is _______________________. - Given the balanced equation: $N + N \text{ -----> } N_2$

	Which statement describes the process represented by this equation? A) A bond is formed as energy is absorbed. B) A bond is formed as energy is released. C) A bond is broken as energy is absorbed. D) A bond is broken as energy is released.
____15. I can explain the difference between a polar covalent bond and a nonpolar covalent bond in terms of the types of nonmetals involved.	Polar covalent bonds are formed when _____ nonmetals share electrons unevenly. Nonpolar covalent bonds form when _____ nonmetals share electrons evenly.
____16. I can explain how to determine the degree of polarity of a covalent bond.	The degree of polarity of a covalent bond is determined by the _____ between the elements. .
____26. I can explain why one covalent bond is more or less polar than another covalent bond, based on electronegativity difference.	Explain, in terms of electronegativity difference, why the bond between carbon and oxygen in a carbon dioxide molecule is less polar than the bond between hydrogen and oxygen in a water molecule.
____28. I can state, in order, the three questions that are asked to determine if a MOLECULE is polar or nonpolar.	When determining if a MOLECULE is polar or non-polar, the first question to ask is_____ When determining if a MOLECULE is polar or non-polar, the second question to ask is_____ When determining if a MOLECULE is polar or non-polar, the third question to ask is_____
____29. I can explain and apply the meaning of SNAP as it applies to determining molecule polarity.	SNAP means_____ Why is a molecule of CH_4 nonpolar even though the bonds between the carbon and hydrogen are polar?

	A) The shape of the CH_4 molecule is symmetrical. B) The shape of the CH_4 molecule is asymmetrical. C) The CH_4 molecule has an excess of electrons. D) The CH_4 molecule has a deficiency of electrons. - · - · - · - · - · - · - · - · - · - · - · - · - · - Explain, in terms of charge distribution, why a molecule of water (H_2O) is polar.
____30. I can determine if a molecular is polar or nonpolar.	Determine which molecules are polar and which are nonpolar. Justify your answer. H_2O CO_2 I_2 CH_4
____32. I can define intermolecular forces and give examples of each.	**<u>Definition:</u>** Intermolecular forces Examples:
____34. I can list the intermolecular forces from STRONGEST to WEAKEST.	Strongest______________________> _________________________> ____ Weakest
____36. I can state the relationship between polarity and IMF strength.	As the polarity of the molecule _______________________, the strength of the IMF __________________________.
____38. Given the physical state of some substances, I can compare the relative strength of the IMF.	At STP, iodine (I_2) is a crystal and fluorine (F_2) is a gas. Compare the strength of the IMF in a sample of I_2 at STP to the strength of the IMF in a sample of F_2 at STP.

____39. Given the boiling points (or freezing points) of some substances, I can compare the relative strength of the IMF.	At STP, CF_4 boils at -127.8oC and NH_3 boils at -33.3oC. Which substance has stronger IMF? Justify your answer.
____40. I can explain and apply the meaning of "Hydrogen bonding is FON".	"Hydrogen bonding is FON" means_____ _____ Which compound has hydrogen bonding between its molecules? A) CH_4 B) CaH_2 C) KNO_3 D) H_2O