

THE SGS - STUDY GUIDE SLIDE – CHEMICAL BONDS QUIZ

- Students must KNOW:

1. What happens when substances undergo Chemical Reactions, what can cause these Reactions, and WHY do certain Elements prefer to react with each other?
2. What is a Valence Electron? How many Valence Electrons does an Atom need to be “happy”?
3. How and Why do Atoms become Ions?
4. What kinds of Elements form Covalent Bonds & which form Ionic Bonds?
5. How are Chemical Formulas & Reactions written, what are the parts of each, and why/how must Reactions be Balanced?

- Students must be able to DO:

1. Differentiate between the “Bohr Model”, “Electron Cloud”, and “Space-Filling” Models for drawing Atoms
2. Draw Bohr Models & Lewis Dot Diagrams for Elements in Periods 1-4.
3. Compare & Contrast Molecules and Compounds.
4. Predict the number of Valence Electrons, Reactivity, and Properties of an Element based off of its Family/Group Name on the Periodic Table.
5. Compare & Contrast Ionic, Covalent, and Metallic Bonding/Compounds and the Properties of Each.



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• Students must KNOW:

1. Atoms are rearranged, since bonds are just broken and reformed. Heat, collisions, concentration, and “catalysts” can cause reactions. Endothermic Reactions take in heat, Exothermic ones release it. Elements prefer to react with an Element that will give them 8 Valence Electrons.
2. The outermost Electrons. Atoms need 8 Valence Electrons to be happy aka have a full outermost energy level.
3. By losing or gaining Electrons. Atoms do this to become more stable aka to get 8 Valence Electrons. Neutral Atoms have equal numbers of Protons and Electrons. Ions bonded together make “Ionic Compounds”.
4. Nonmetal + Nonmetal = Covalent. Metal + Nonmetal = Ionic
5. Formulas show a ratio of Atoms. Formulas can have Subscripts (little # after a symbol), Coefficients (big # before a symbol), and Parentheses. Reactions are written to show “Reactant” chemicals on the left turning into “Products” on the right. Reactions are written as Equations, they use Math Symbols, but the “Yield” Arrow (\rightarrow) instead of the = sign. Reactions must be balanced due to the Law of Conservation of Energy, and to balance them just add Coefficients before each Atom/Molecule.

• Students must be able to DO:

1. Bohr shows the Valence Electrons and can help predict how Atoms bond, the Electron Cloud is the most accurate representation of an Atom, and the Space-Filling is good for showing food molecules.
2. See your Jot-Down Notes on drawing Bohr and Lewis Diagrams. Note that both are good for predicting how Atoms will bond.
3. Molecule = Two or more Atoms. Compound = Two or more DIFFERENT Atoms. All Compounds are Molecules, but not vice versa.
4. Group Number can tell you the number of Valence Electrons. Groups 1-2 have 1-2 Valence Electrons, while 13-18 have the Group Number minus 10. Elements will react to get 8 valence Electrons, and whether or not an Element tends to react depends on its number of Valence Electrons (its easier to react if an Element only needs to gain or lose 1 Valence Electrons. Ex: Alkali Metals in Group 1 are very reactive, Noble gases in Group 18 are not).
5. Ionic tend to conduct electricity when dissolved in water. Covalent involve the sharing of Electrons. Metallic are good conductors since the Electrons can move around freely.

