**Lesson Plan Title: Introduction to Bonding**

**Teacher’s Name: Mr.Gomez Subject/Course: Chemistry**

**Unit: Bonding Grade Level: College Prep/Honors**

**Overview of and Motivation for Lesson:**

**Bonding will help students understand what is occurring in a chemical reaction**

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| **Stage 1-Desired Results** | | |
| **Standard(s):**  HS-PS1-2. Use the periodic table model to predict and design simple reactions that result in two main classes of binary compounds, ionic and molecular. Develop an explanation based on given observational data and the electronegativity model about the relative strengths of ionic or covalent bonds. Clarification Statements: \* Simple reactions include synthesis (combination), decomposition, single displacement, double displacement, and combustion. \* Predictions of reactants and products can be represented using Lewis dot structures, chemical formulas, or physical models. \* Observational data include that binary ionic substances (i.e., substances that have ionic bonds), when pure, are crystalline salts at room temperature (common examples include NaCl, KI, Fe2O3); and substances that are liquids and gases at room temperature are usually made of molecules that have covalent bonds (common examples include CO2, N2, CH4, H2O, C8H18).   * Click here to enter text. | | |
| **Aim/Essential Question:**   * Why | | |
| **Understanding(s):**  *Students will understand that . . .*   * Ionic Bonding involves transfer of electrons, typically between a metal and nonmetal * Covalent bonding involves a sharing of electrons which occurs between two nonmetals * Metallic Bonding involves a sea of delocalized electrons * Cations are positive ions and are the result of loss of electrons * Anions are negative ions and result of gain of electrons * Some molecules are polar and other molecules are non-polar | | |
| **Content Objectives:**  *Students will be able to . . .*   * Identify the difference between a covalent, metallic and ionic bond * Describe the difference between a cation and an anion * Calculate whether a compound is polar or non-polar | | **Language Objectives:**  ELD Level 2 *Students will be able to . . . in English*   * Recognize the different types of chemical bonds by listening for the key components of each   ELD Level 3 *Students will be able to . . . in English*   * Discuss with classmates why each ion is a cation or anion? |
| **Key Vocabulary**   * Ionic Bonding * Metallic Bonding * Covalent Bonding * Anion * Cation * Polar * Non-Polar * Molecule | | |
| **Stage 2-Assessment Evidence** | | |
| **Performance Task or Key Evidence**   * Students will answer the teacher’s questions and defend their reasoning why they believe their answer is correct * Students will do worksheet in pair or individually | | |
| **Key Criteria to measure Performance Task or Key Evidence**   * Students will hand in worksheet at the end of the class and answer at least 60% of the questions correctly | | |
| **Stage 3- Learning Plan** | | |
| **Learning Activities:**  Do Now/Bell Ringer/Opener: Day 1: What is electronegativity trend when going across a period? Day 1: What is electronegativity trend when going down a group? Day 2: What is the electron dot diagram for H2O? What type of bond occurs between Silicon Dioxide(SO2)?  Learning Activity Day 1:  Students will take out a piece of paper and start taking notes from the PowerPoint on bonding.  Students will do problems to identify the difference between a cation and anion. Along with problems on identifying the difference between each bond. Students will do problems to determine whether a molecule is polar or nonpolar  The teacher will talk about Ionic, Covalent and Metallic bonding, cations, anions. The teacher will ask students to defend their reasoning on why how they know each compound or ion is the one they said it was.  Teacher will then lead the students through problems on how to draw electron dot diagram for Ionic and Covalent Compounds?  Teacher will restate that each compound can only have 8 electrons  Students will respond to teacher by giving a Metal and nonmetal or 2 non-Metals from the periodic table  Learning Activity Day 2:  For Honors: Electron Dot diagrams for Polyatomic will be introduced.  Teacher will do three example of polyatomic electron dot Diagrams with the Class  NH4+, SO42-, SCN-  For everyone: Students will be give out a 2-sided worksheet in which they will Practice yesterday’s material  One side will be on cations and Anions and the other side will be on Electron Dot Structures and identifying the type of chemical bond it forms.    Application  Click here to enter text.  Summary/Closing  Click here to enter text.  **Multiple Intelligences Addressed:**   |  |  |  |  | | --- | --- | --- | --- | | Linguistic | Logical-Mathematical | Musical | Bodily-kinesthetic | | Spatial | Interpersonal | Intrapersonal | Naturalistic |   **Student Grouping**  Whole Class  Small Group  Pairs  Individual  **Instructional Delivery Methods**  Teacher Modeling/Demonstration  Lecture  Discussion  Cooperative Learning  Centers  Problem Solving  Independent Projects | | |
| **Accommodations**  None | **Modifications**  None | |
| **Homework/Extension Activities:**  None | | |
| **Materials and Equipment Needed:**   * Worksheet * Powerpoint * Projector * Colored Pencils * Electronegativity chart | | |

**Adapted from Grant Wiggins and Jay McTighe-*Understanding by Design***