**Lesson Plan Title: Chemical Bond Properties**

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

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

**Overview of and Motivation for Lesson:**

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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). | | |
| **Aim/Essential Question:**   * How are properties of chemical bonds determined? | | |
| **Understanding(s):**  *Students will understand that . . .*   * Ionic Bonds have high melting points and boiling points * Covalent bonds have low melting and boiling points * Metallic bonds have high melting and boiling points * Metallic bonds and Ionic bonds are conductive * Covalent bonds are not conductive * Ionic bonds are soluble in polar molecules * Covalent Bonds are soluble in non-polar molecules | | |
| **Content Objectives:**  *Students will be able to . . .*   * Describe properties of Ionic Bonds * Describe properties of Covalent Bonds * Describe properties of Metallic bonds * Give examples of each chemical bonds | | **Language Objectives:**  ELD Level Choose an item. *Students will be able to . . . in English*   * Describe the conductivity of Chemical Bonds to a partner in their own words   ELD Level 3 *Students will be able to . . . in English*   * Use the following sentence structure:   \_\_\_\_\_\_\_\_\_\_\_ for\_\_\_\_\_\_ bonds is High or low |
| **Key Vocabulary**   * Conductivity * Solubility * Boiling Point * Melting Point * Texture | | |
| **Stage 2-Assessment Evidence** | | |
| **Performance Task or Key Evidence**   * The students will be lead in a discussion about the properties of Ionic Bond, Covalent Bond and Metallic bond and defend their reasoning. * Students will observe solubility and conductivity and predict what will happen. Students will check if their observations were right | | |
| **Key Criteria to measure Performance Task or Key Evidence**   * None | | |
| **Stage 3- Learning Plan** | | |
| **Learning Activities:**  Do Now/Bell Ringer/Opener: Students will grab plickers from their folders and answer the following questions What is the chemical formula for Calcium Phosphide? Calcium Selenide? What is the Chemical Name for LiF? AlN?  Learning Activity 1:  Teacher will show on the projector the graphic organizer on chemical bond properties through the elmo. The teacher will then discuss the properties and give examples for each property. Properties covered  Melting Point  Boiling Point  Texture  Conductivity  Solubility  Learning Activity 2:  Teacher will show videos about demonstration about solubility and conductivity through the PHET simulation and videos will be shown to demonstrate the properties. Potential in person demonstration(oil and water, sugar in water, salt in water)  Application  **Compare each type of chemical bond**  Summary/Closing  **How do you think covalent bonds would behave?**  **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:**   * NaCl * Conductivity Probe * Bunsen burner * Graphic organizer * Sugar * Oil * Water * Soap | | |

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