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| **Lesson Plan:** |

**Learning Outcomes:**

1. Recognize and correct mistakes in chemical formulas of ionic compounds
2. Draw Bohr models for ionic compounds written in their chemical formulas
3. Construct ionic compounds from at least 2 different elements
4. Describe the discoveries that shaped the model of the atom

**Big Ideas and skills**

1. Write compound names and chemical formulas of ionic compounds
2. Explain how ionic compounds are creating using the periodic table

**PLOs:**

**C3** write and interpret chemical symbols of elements and formulae of ionic compounds

**Skills developed to meet development goals**

1. Self-directed learning
2. Critical thinking
3. Collaborative skills
4. Asking questions
5. Creativity
6. Leadership

**Material and equipment needed**

**-** students' textbooks

- cotton swabs, dish soap, milk (2%), food coloring (at least 2 colors)

**Assessment Plan:**

**Formative -**

**Hook and Introduction**

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| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 10 min | * Milk, food coloring, and soap cotton swab | * Have milk under hover cam * Doing art project and need student's help * Ask volunteer to sprinkle food coloring over milk * Ask 2nd volunteer to dip cotton swab and ask what will happen? * Ask 3rd volunteer to take soap dipped cotton swap and dip it in the milk * Now move it around | Discussion:  What's going to happen if we just dip the cotton swab?  What if we have dish soap on it?  What is going on?  Is this physical or chemical change? |

**Development**

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| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 15 min | * Class directed note taking | * Introduce challenge to students * What roles are needed * Guiding questions help direct the note taking session * *Shortened version: 1 questions - to form an ionic compound, an element either loses or gains electrons. What determines how many electrons they lose/gain?* | * Can we answer the following questions: 1) Given a metal and a non-metal element, how do we write a chemical formula of these 2 elements as an ionic compound? (ex. Mg and Cl) **Mg loses 2 electrons and gives each to 1 other Cl so 2 Cl's have -1 charge. These ions would attract each other to form MgCl2.** 2) Why are they assigned the subscripts you gave above?  **How many of each ion needed to neutralize the charge on the other metal/non-metal. The charges on the ions depend on how many electrons lost.** **The number of electrons lost depends on which group on the periodic table the element is in. The losing and the gaining of electrons means each element wants to be like their stable noble gases.** |
| 10 min | * Class activity: musical ions * 3 of Al3+, N3- * 4 of Mg2+, O2- * 5 of K+, Cl- | * Each person gets an ion. * Music comes on and everyone mingles. * When music stops, everyone must form an ionic compound. * Incorrect ones are out. Lonely ones are out. * Few rounds until 1 ionic compound left | * Are students getting the right ions together to form an ionic compound? * What are the common mistakes? |
| 15 min | * Introduce multivalent/polyatomic ions as non-metals * Introduce Bohr with ions | * Teacher directed note-taking * Notes, example, question * Bohr - single atom only, can be in ionic form * Notes, example, question | * These have overall charge (negative) that is attracted to the positively charged metals * Subscripts + brackets |
| 10  min | * Count to 6 - each group has 4 * Come up with 1 good question as group with written solution | * Instructions + learning outcomes * Count students off * Get into groups * Craft 1 good question as group * Write question + solution on piece of paper + all names of group members * Have 4 copies of the question written, one for each group member | * Students hand in questions at end of class |
| 10  min | * Cross connecting group members - sharing | * Assign a, b, c, d to each member * A/B/C/D in different corners. Share questions and quiz each other. | * Students hand in questions at end of class |

**Closure**

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| **Time** | **Activity** | **Teaching notes** | **Assessment** |
| 5 min | * Check with class which methods they preferred? - student notetaking? teacher note taking? * Group questions in * Quiz next class * Class at room 319/320 next class for quiz and simulations | - Show learning outcomes | Quiz - 1 single-sided, handwritten notes, 8.5 by 11' paper ONLY |