**GRASPS**

**TEACHER NOTE:** Please note that students should be exposed to compounds like calcium carbonate and sodium hydrogen carbonate but will only be required to name and write formulas for binary compounds. This is why the formulas are provided for the polyatomic compounds to students.

Product: You will write a technical report that will include data tables with analysis for each station.

Each station will be provided with beakers or plastic cups, thermometers, ph paper or a universal indicator, a heating unit, a stirring apparatus, ice cubes, a conductivity apparatus, massing paper, and a balance. A digital microscope or any other magnifying tools could be used to measure particle size.

A list of compounds that may be used on this activity is: two different size crystals of sucrose (table sugar C12H22O11 ), sodium chloride (salt NaCl), Calcium Carbonate (CaCO3) and Sodium Hydrogen Carbonate (NaHCO3), Potassium Chloride (KCl), Copper II Sulfate (CuSO4), Magnesium Sulfate (MgSO4), ascorbic acid (Vitamin C, C6H8O6), Sodium Carbonate (Na2CO3), Ammonium Chlorate (NaH4ClO3)

**Goal:** To develop a technical report on the properties of selected compounds, solutions, and reactions.

**Role:** Lab technician

**Audience:** The Lab Supervisor (the teacher)

**Scenario:** You are seeking employment with Chem Labs Inc, a company specializing in bonding properties and solubility. Your ability to perform basic chemical procedures will be evaluated as part of the hiring process. You will be provided with several compounds. To complete the evaluation you will move through a series of lab stations, completing the required processes at each station.

It must also include descriptions of the properties of the compounds and solutions, as well as a description of any reaction that may occur. Your conclusion will include generalizations of properties of bonding based on the observations from each station and the analysis of the results of the tests performed.

Station 1:

At this station, you will be testing the effect of temperature on the solubility of ionic versus covalent compounds. You will need to design a procedure to obtain the necessary data, develop a data table to record the information, and create a solubility curve.

Station 2:

At this station, you will be testing the effect of particle size and agitation on the solubility of ionic versus covalent compounds. You will need to design a procedure to obtain the necessary data and develop a data table to record the information.

Station 3:

At this station, you will be testing the effect of concentration on the conductivity for ionic versus covalent compounds. You will need to test each solution to determine if the solution is an acidic or basic. Based on these results explain how the properties of a solution, such as conductivity and acidity, are related to whether the solute is ionic or covalent. You will need to design a procedure to obtain the necessary data and develop a data table to record the information.

Your technical report should address:

• Potential problems with the test procedures used to identify the effect of the type of bonding on different solubility properties.

• Evaluate whether conclusions are reasonable by a review of the process.

• Should explain what you did, why you did it, what you discovered, and what is significant of your findings. The report should identify clearly what is novel about your work, and how it relates to prior knowledge.

• The report should include the following components: descriptive title, author name, date, informative abstract, list of keywords, body, and list of references. Additional separate appendices, where appropriate, may also be included.

• The standard four-part outline for the body of a technical report is motivation, methods, results, and discussion.