

- Teams will use various tests to characterize the substance. These tests are to be determined by the students, not the supervisor. It is recommended that students be given 25-35 minutes to do these tests. Data is to be recorded on a data sheet with the 1<sup>st</sup> colored writing implement provided by the event supervisor. It should be neat and organized.
- During testing and observation of their substance, students must record their data and number it sequentially as it is collected. Any mistakes or changes should be crossed out (with one line).
- A clean up time of  $\geq 10$  minutes will follow. The supervisor will collect all samples and announce the appropriate clean up procedures. A scoring deduction may be incurred for improper clean up procedures. The 1<sup>st</sup> writing implement will be collected before the questions are given to the team.
- Students will be given a 2<sup>nd</sup> different colored writing implement and a list of questions about the characteristics of their substance. The ability to answer these questions will depend on the quality and thoroughness of their investigations. Questions will have answers that derive from student observations. If the team has sufficient data and/or observations to support the answer to a question, they are to simply place the data number(s) recorded in 3 a. beside the question. Place a number for all data that supports your answer to the question. (15 minutes) Questions will not be asked about melting point
- Examples of Possible Substances:** baking soda ( $\text{NaHCO}_3$ ), borax, Epsom salts, sugar, alum, chalk, non-iodized table salt ( $\text{NaCl}$ ), sodium acetate ( $\text{NaC}_2\text{H}_3\text{O}_2$ ), starch, talc, calcium carbonate, ammonium chloride, boric acid, copper (II) chloride, copper (II) sulfate, etc. Note: colored, as well as white salts are permissible.

#### 4. SAMPLE QUESTIONS:

- Is the substance soluble in water?
- If soluble in water, is the solution capable of conducting a current?
- Does the substance react with an acid to produce a gas?
- If soluble in water, what is the approximate pH of the solution?
- If soluble in water, does the substance dissolve endothermically or exothermically?
- Using a hand lens, what is the shape of the individual particles or are they too small to see?

#### 5. SCORING:

- Each question is worth 5 points. The number of points awarded will depend on the quality of the data and/or observations. If the team remembers an answer to a question but does NOT have the supporting data and/or observations, they may write the answer to the question with their writing implement and receive a maximum of 2 points.
- Using the most answers that received 5, then 4, then 3, etc., will break ties. Time is not a tiebreaker! For instance if a student observes that when 0.1 g of the powder is put into 5 ml of water, the powder floats on the water until it is stirred, that observation would receive 5 points to the question of what happens when the substance is placed in water. But a 4 point answer might be that the substance floats on the water. If the student writes an inference instead of an observation, such as the density of the solid is less than water, the student would receive at most 3 points.

