Solubility Solutions

Your teacher will assign groups to measure the solubility for one solid each and we will compile the information as a class.
Caution – you will need to wear gloves, and a lab coat for this activity. Please report any spills to the teacher.
You must work very efficiently to complete this lab properly.

Materials Needed:
Test Tube
Test Tube rack
Teaspoon measuring spoon
Rubber stopper

Lab procedure and data collection Instructions:

1. Use the graduated cylinder provided to measure 10 mL of water into your test tube
2. Measure one leveled teaspoon of your test solute and carefully pour it into the test tube. Add a tally mark to your observation table.
3. Use the rubber stopper to close the tube.
4. Using your thumb to hold the stopper in place, invert and mix the solute into the solvent.
5. Once the solute is dissolved completely , repeat steps 2-4 until the solute does not completely dissolve.
6. Using the mass provided by your teacher, calculate the TOTAL mass added to your test tube and enter it in the column provided for your group.
7. Collect the rest of the information from the other groups in the class and complete the TOTAL columns for each substance.

Solute Tested	Amount of solute added - tally or list	TOTAL Group 1	TOTAL Group 2	TOTAL Group 3	Average Mass in 10mL	Calculated mass in 100mL
Table Salt (Sodium Chloride)						
Sugar (sucrose)						
Baking Soda (sodium bicarbonate)						
Epsom Salts (Magnesium Sulfate)						

Calculations & Analysis Instructions

You have calculated the average mass that dissolved in 10mL of water. Now you need to calculate how much could be dissolved in 100 mL of water.

1. Using the Average Mass in 10 mL you have already calculated, multiply this by 10 to get your Calculated Mass in 100 mL. Use the space below to show your work. Enter these values in your table.

2. Compare your values in the Calculated Mass column to the values in Table 1.2 on page 20 in your textbook. Are your results similar? If not, were they higher or lower than the accepted values in the table? Give some reasons why you think your values were what they were.

3. Which solution used by the class was the most soluble in water? Which was the least soluble?

4. Based on your results, which solute used do you think has particles that are the most attracted to water?

Conclude and Apply:

5. Review the solubility graph shown in your textbook on page 23. The graph shows the solubility of ammonia, sylvite, and potassium nitrate in water.
    a. A student adds 50 g of sylvite to 100 mL of water at 60ºC. The resulting solution is best described as:

    b. A solution is prepared by adding 50 g of potassium nitrate to 100 mL of water at 50ºC. What type of solution has been created?

    c. Ammonia is a gas. Describe what happens to the solubility of ammonia as temperature increases from 20ºC to 80ºC.

    d. Which two substances have the same solubility at 28ºC?

Marking rubric

Criteria	A WOW!	B Yes!	C Yes, but…	D Not Quite
Data Collection	Observations are detailed yet concise and written in appropriate language. Measurements include units and are neat and complete.	Observations are detailed but may not be written in appropriate language. Measurements include units but are either incomplete or messy.	Observations are vague and are not written in appropriate language. Measurements are missing some units and neatness is questionable.	Observations and Measurements are sketchy or incomplete. The data collection does not accurately reflect the lab.
Conclusions **X2**	Questions are answered thoroughly, accurately and use data to provide convincing support for conclusions.	Questions are answered accurately and use data to support conclusions.	Questions are answered but may not be completely accurate. Data provides only partial support for conclusions.	Questions are incomplete and may not be completely accurate. Conclusions are not data.
Communication throughout lab	Communicates clearly with group members regarding instructions resulting in a seamlessly performed lab.	Communicates well with group members regarding instructions and the lab is performed well.	Communicates with members of the groups regarding instructions and the lab is completed.	Communication with group members is lacking and lab execution suffers as a result.

This lab assessment is:

FORMATIVE **SUMMATIVE**

You have achieved the ‘mark’ of:

Ach MP SR **A B C**

<u>Teacher Comments:</u>