

Student directions *Molarity* activity

Learning Goals: Students will be able to

- Determine the solubility for some solutes and explain why the solubility cannot be determined for others given experimental constraints.
- Identify the relationships for measurable variables by designing quantitative experiments, collecting data, graphing, and using appropriate trend lines.

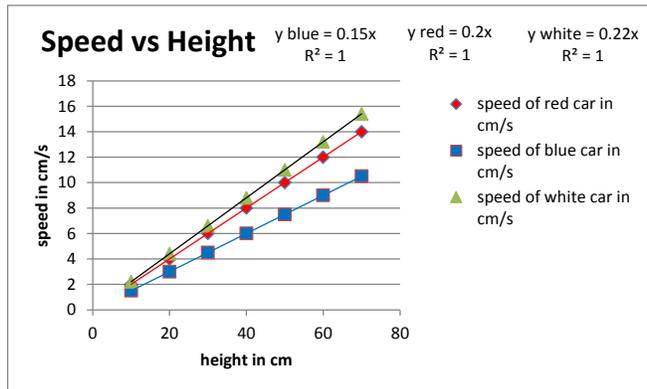
Prelab:

- When you were dissolving salt or sugar in a beaker of water, how did you know it was a saturated solution?
- If you designed an experiment for another student for them to see some saturated solutions and some unsaturated solutions, what might you have them do?

Directions:

- Make a list of all the solutes and determine the solubility if possible.
 - Explain how you know you have identified the solubility.
 - Explain why you couldn't determine the solubility for some substances. How does this explanation match your experimental ideas for Prelab #2?
- What are the variables for solutions in this simulation? Which are independent and which are dependent?
- Design an experiment to determine the relationship between one of the independent variables and the dependent one. Collect data for more than one solute so that you will have more than one trend line to support your conclusion about the relationship.
 - Excel hint: To graph more than one set of data and make multiple trendlines. First make sure that the independent variable values are consistent; put them in the A column. Then, you can put the dependent results in other columns. For example, a student may design an experiment to determine the speed of three toy cars at the bottom of a ramp released from a variety of heights. Their data table and graph might look like this:

Height in cm	speed of red car in cm/s	speed of blue car in cm/s	speed of white car in cm/s
10	2	1.5	2.2
20	4	3	4.4
30	6	4.5	6.6
40	8	6	8.8
50	10	7.5	11
60	12	9	13.2
70	14	10.5	15.4



- Design an experiment to determine the relationship between the other independent variable and the dependent one. Collect data for more than one solute so that you will have more than one trend line to support your conclusion about the relationship