MiSP Solubility Worksheet #2 L1

Name _____   Date _____

We have considered some conditions that allow solutes to dissolve in solvents, but we have not yet considered the solubility of a solute. **Solubility is defined as the maximum mass of solute that can dissolve in a certain quantity of solvent <u>at a specified temperature</u>.** Below is a data table that shows the solubility of ammonium chloride (NH_4Cl) at various temperatures. Use the data table to construct a line graph (page 2). Remember to set up your axes and label appropriately.

| Water Temperature (°C)	Maximum Mass of Ammonium Chloride that can be dissolved in 100 grams of water (g)
0	30
20	37
40	46
60	55
80	65
100	76

1. We want to know how many grams of ammonium chloride can dissolve in water at various temperatures. In this case, what are the independent and dependent variables?

      Independent variable _____

      Dependent variable _____

Graph the data:
- Label your *x*- and *y*-axes.
- An appropriate scale and increments should be chosen.
- The *x*-values range from _____.
- The *y*-values range from _____.
- You may use increments of 5, 10, 20, or whatever you think is appropriate. Remember that every data point does not have to fall exactly on one of the numbered lines.
- Plot the data points and draw a best-fit line through the data points.
- Add a title to the graph.
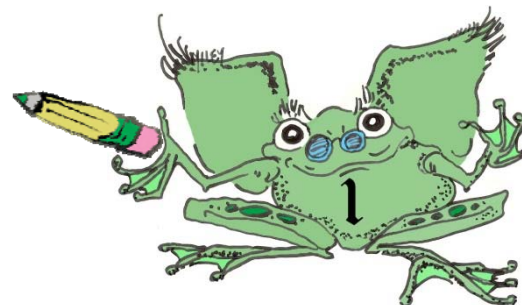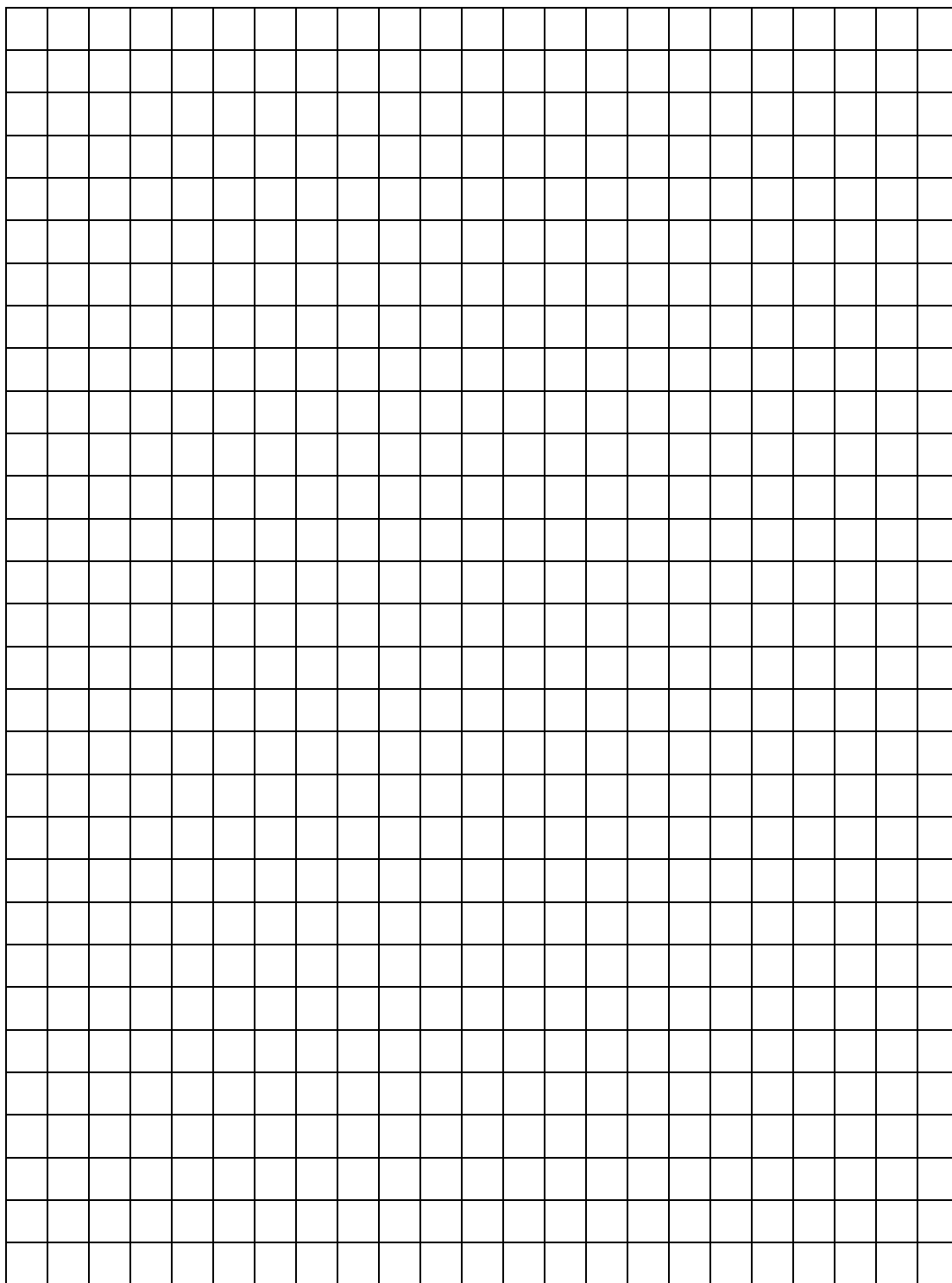
Discussion Questions:

1. Use your best-fit line to determine how many grams of ammonium chloride will dissolve at a temperature of 70°C. _____ grams

2. What temperature would be necessary to dissolve 50 grams of ammonium chloride? _____ °C

3. As the temperature increases from 20°C to 100°C on your best-fit line, the mass of the solute dissolved in grams increases by _____.