

Name: _____ Period: _____ Date: _____



Mammoth Cave National Park Lab: Saturation Point

Question: How much solute can water dissolve?

Materials:

- Distilled water
- Granular sugar
- 3 250 mL beakers
- Stirring rod or spoon
- 100 mL graduated cylinder
- Digital scale
- Hot plate
- Thermometer
- Masking tape
- Permanent marker

Procedure:

1. Label each of your beakers with the masking tape and permanent marker as "20° C", "40° C", and "60° C". Then, using the graduated cylinder, pour 100 mL of distilled water in each beaker.
2. Measure the mass of each beaker with the digital scale. Record your data in the chart.
3. Place the "20° C" beaker on the hot plate, put the thermometer in the water, and turn the hot plate on - do this slowly. When the temperature has reached 20° C, turn the hot plate on its lowest setting to keep a constant temperature.
4. Using just a little bit at a time, begin to put sugar in the water and stir so that it is all dissolved. Do this - again, very slowly - until no more sugar can be dissolved. Be careful not to spill!
5. Once the water in your beaker cannot dissolve any additional sugar, place it on the digital scale and record the mass in the chart.

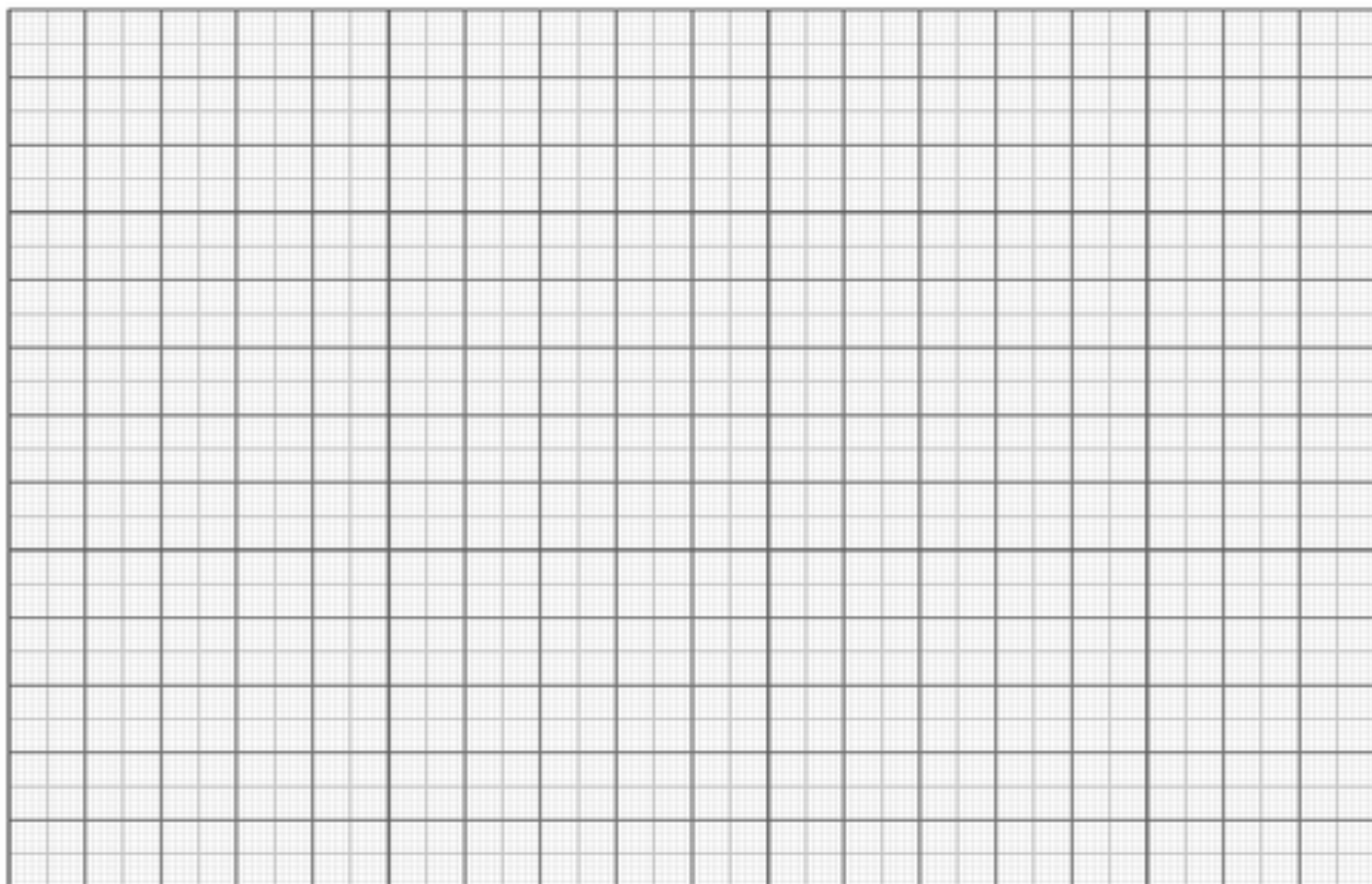
6. Calculate the amount of sugar you dissolved in the water by subtracting the mass of the beaker with sugar dissolved minus the mass of the beaker with only water. Record in the chart.
7. Repeat steps 3-6 with the other two beakers.

Data:

<u>Water temperature</u>	<u>Mass of beaker with 100 mL of water (g)</u>	<u>Mass of beaker with sugar dissolved (g)</u>	<u>Amount of sugar dissolved (g)</u>
20° C			
40° C			
60° C			

Analysis:

Graph your findings on how temperature of water affects the amount of sugar that can be dissolved.



1. Identify the solute and solvent in your solution.

2. Scientists describe the point at which a solution cannot dissolve any additional solute as the “saturation point”. How did the changing the temperature of water affect the saturation point of sugar?

Conclusions:

3. Explain how dissolved calcium carbonate can come out of solution to create cave formations such as stalactites and stalagmites such as the ones seen in Mammoth Cave.
