**Learning Goals**

* Describe the relationships between volume and amount of solute to solution concentration.
* Predict how solution concentration will change for any action (or combination of actions) that adds or removes water, solute, or solution, and explain why.

1. Explore the sim and discuss with your partner how this simulation compares (similarities and differences) to [Molarity PhET](http://phet.colorado.edu/en/simulation/molarity). Write down a few observations.
2. Understanding Molarity
   1. How many moles is
      1. 55 g of NaCl? \_\_\_\_\_\_\_\_\_0.025 g of NaCO­3? \_\_\_\_\_\_\_\_\_\_\_\_
      2. How many grams is 0.5 moles of NaCl? \_\_\_\_\_\_\_2.11 moles of NaCO­3?\_\_\_\_\_\_\_
   2. Research to find out what Molarity (mol/L) is measuring include citation. What is the common word used to describe the measure of Molarity in the simulation?
   3. Describe in your own words how mol/L compares to grams/liter. (similarities and differences)
3. Find at least 2 ways in the simulation to change each of the parameters:
   1. Volume of solution \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Amount of solute \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Concentration of solute in solution \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. How does volume affect concentration?
   1. Is dilution directly or indirectly related to Molarity? \_\_\_\_\_\_\_\_\_\_\_\_
      1. Explain how you used the sim to determine the relationship and give evidence of measurements you made to support your ideas.
      2. How is evaporation related to Molarity? Use your own words to describe why the relationship makes sense based on the data you used to support the dilution relationship.
   2. What is one way to change the volume without changing the concentration? Describe why the concentration doesn’t change.
5. Does the concentration change in the same way if you used solid or liquid to add solute? Explain why your observation makes sense using things from your everyday life like table salt.
6. What are all the things that affect Concentration measured in mol/L (parameters in the sim).

List here and identify if the variable is directly or indirectly related to the concentration: