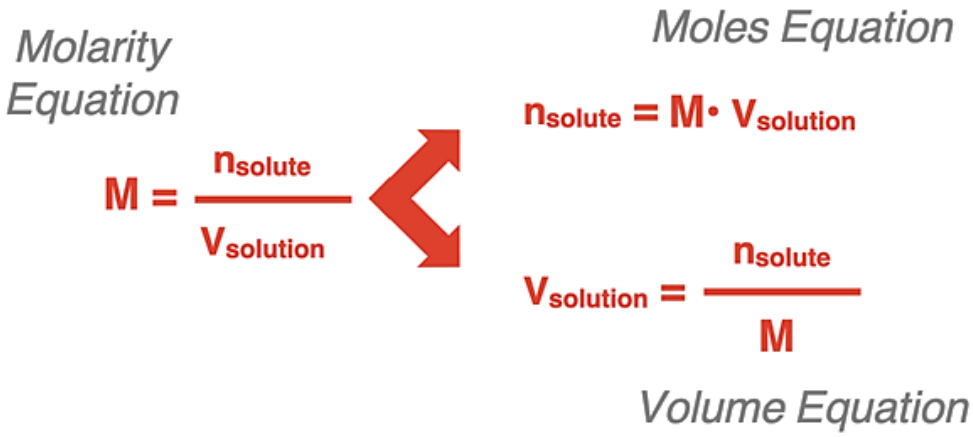
Solutions **Name**_____

Molarity

Read from **Lesson 2: Concentration Part a: Molarity** in the **Chemistry Tutorial Section, Chapter 13** of **The Physics Classroom**:

In chemistry, understanding how solutions are measured is essential, and one of the most important ways to express concentration is through molarity. **Molarity**, represented by the symbol **M**, refers to the number of moles of solute (the substance being dissolved) per liter of solution. It provides a clear and consistent way to describe how much of a substance is present in a given volume of liquid.

Here is the molarity equation, along with some variations. The equation that is used depends on what quantity needs to be calculated.



Molarity Questions: Please show your work!

1. What is the molarity M, of these solutions?
   a. 3.0 moles of magnesium sulfate are dissolved in 1 liter of solution.

   b. 1.5 moles of calcium fluoride are dissolved in 2000 mL of solution.

   c. 3.25 g of potassium hydroxide are dissolved in 500 mL of solution

2. What volume of the following solutions would contain…
   a. 1.8 moles from a 6.0 M solution of hydrochloric acid?

   b 20.0 g of sodium hydroxide from a 2.0 M solution?

Solutions

3. What mass of the following are needed to make:
   a. 2.00 L of a 0.500 M solution of sodium carbonate?

   b. 250 mL of a 6.00 M solution of nitric acid?

4. 27.74 g of magnesium phosphate are dissolved in 714 mL of solution.
   a. What is the molarity of the magnesium phosphate solution?

   b. What is the concentration of magnesium ions in solution?

   c. What is the concentration of phosphate ions in solution?

5. Which of the following solutions has the highest concentration of iodide ions?
   a. 0.20 M aluminum iodide solution or a 0.50 M potassium iodide solution

   b. 150 mL of a 0.050 M vanadium (V) iodide solution or 200 mL of 0.10 M potassium iodide solution

   c. A 2.14 M calcium iodide solution or a solution made by dissolving 60.2 g of lithium iodide in water to make 100 mL of solution.