Unit 8 NAME

Class Work 3/29/14

8.7 Concentration

SPARK

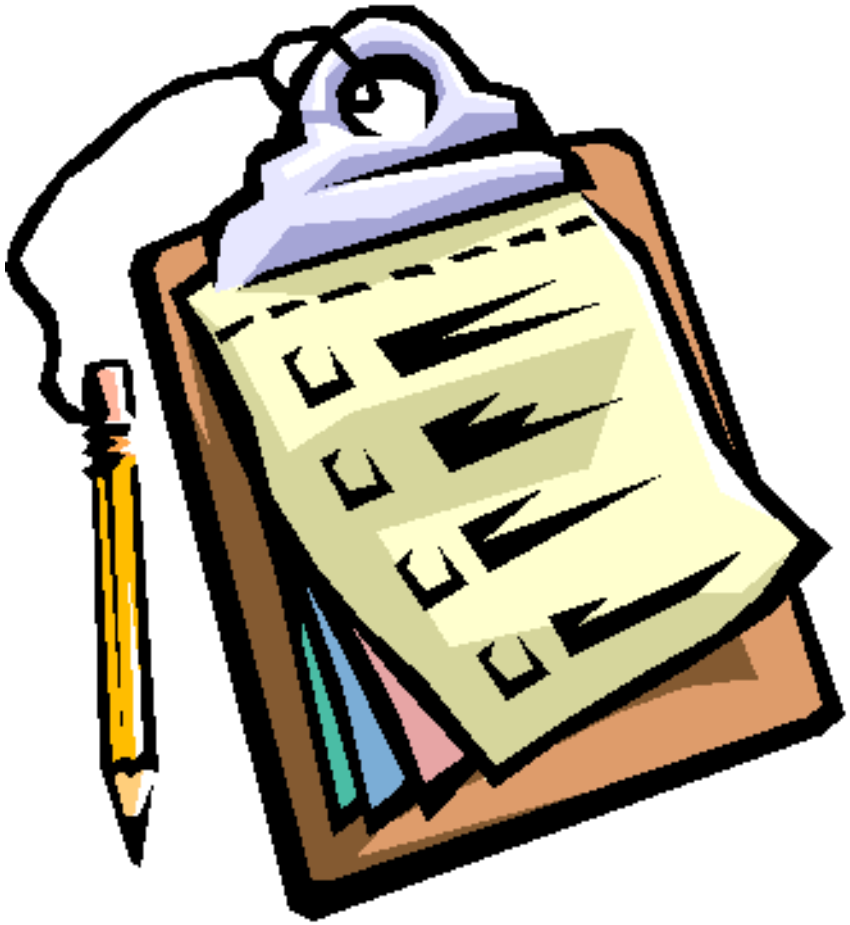
1. What symbol indicates a solution in a chemical equation?
2. If I have 2.5 g of $NaHCO_3$, how many moles of $NaHCO_3$ do I have? [GFM: 84 g/mol]
3. How many liters are in 200 mL of solution?

Objective

SWBAT calculate the concentration of a solution

Agenda:

- SPARK/Objective
- Hook
- Molarity
- Practice
- Homework



Objective: SWBAT calculate the concentration of a solution

Anions Quiz Shout Outs!

- Ramlah
- Ysabelle
- Rimsha
- Shayna
- Rahila
- Wyllana
- Monica
- Rasanya
- Chaynah
- Mahnoor
- **Videos are posted on the website!**

Objective: SWBAT calculate the concentration of a solution

Cations Quiz Shout Outs!

- Wendy
- Damani
- Nadia
- Geniever
- Mekhrangiz
- Nadira
- Shagufta

Videos are posted on the website!

Objective: SWBAT calculate the concentration of a solution

Juice from Concentrate

How do you make juice from concentrate?

What do you do if you want the juice to taste **juicier**?

What do you do if you are giving the juice to a baby who **shouldn't have too much sugar**?

Objective: SWBAT calculate the concentration of a solution

Observe and Answer…

- Given the two reaction systems with vinegar and baking soda as the reactant, what do you notice was the difference between the reactions and WHY do you think this happened?

In your table groups, discuss what you saw and why you think this happened!

Molarity is a measure of concentration

Check out Table T!

$$\text{molarity} = \frac{\text{moles of solute}}{\text{liters of solution}}$$

$$\text{Molarity (M)} = \frac{\textbf{moles} \text{ of solute}}{\textbf{Liters} \text{ of solution}}$$

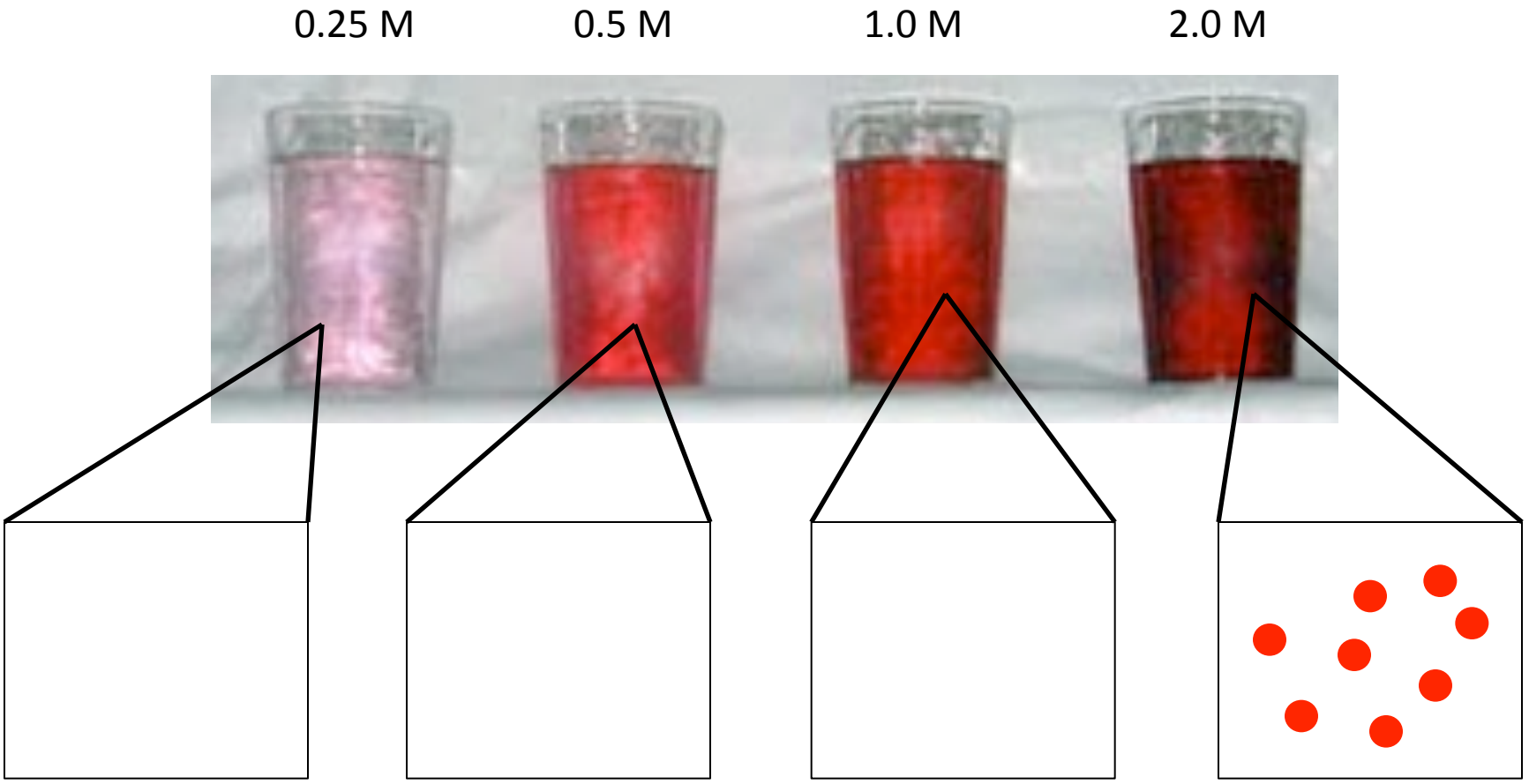
Objective: SWBAT calculate the concentration of a solution

Example 1

- What is the concentration of 200 L solution containing 600 moles of KNO_3?

Objective: SWBAT calculate the concentration of a solution

What does this mean?



Objective: SWBAT calculate the concentration of a solution

Example 2

Which solution is the most concentrated?
(1) 1 mole of solute dissolved in 1 liter of solution
(2) 2 moles of solute dissolved in 3 liters of solution
(3) 6 moles of solute dissolved in 4 liters of solution
(4) 4 moles of solute dissolved in 8 liters of solution

Objective: SWBAT calculate the concentration of a solution

Example 3

What is the total number of moles of H_2SO_4 needed to prepare 5.0 liters of a 2.0 M solution of H_2SO_4?

Objective: SWBAT calculate the concentration of a solution

Example 4

How many moles of solute are contained in 200 milliliters of a 1 M solution?

Objective: SWBAT calculate the concentration of a solution

What about when we talk about REALLY SMALL AMOUNTS OF SOLUTE?

- For small concentrations, we use **ppm (parts per million)**

Scientists use ppm mostly in an environmental context. (Ex. Pollution, concentrations of chloride in our drinking water, etc.)

Objective: SWBAT calculate the concentration of a solution

Parts per million calculation

$$\text{parts per million} = \frac{\text{grams of solute}}{\text{grams of solution}} \times 1\,000\,000$$

What do you notice is different about the molarity formula versus the parts per million formula?

Objective: SWBAT calculate the concentration of a solution

Example 5

A 3.2-gram sample of air contains 0.00074 gram of hydrogen cyanide. Determine the concentration, in parts per million, of the hydrogen cyanide in this sample.

Objective: SWBAT calculate the concentration of a solution

Why is concentration important?

Carbon monoxide levels	Response to CO levels
0-8 ppm	Non-smoker
20 ppm	Loss of oxygen to vital organs begin
35 ppm	Legal limit of 8-hour exposure in workplace
50 ppm	Urban "Air Pollution Emergency" alert
60 ppm	Headaches, nausea, mild central nervous system dysfunction

Smoking is NOT cool.

Objective: SWBAT calculate the concentration of a solution

Classwork

- Complete your 8.7 classwork!

Objective: SWBAT calculate the concentration of a solution

Exit Ticket

Complete your 8.7 Exit Ticket!

Objective: SWBAT calculate the concentration of a solution

HOMEWORK

Finish 8.7 Classwork/Homework

Objective: SWBAT calculate the concentration of a solution