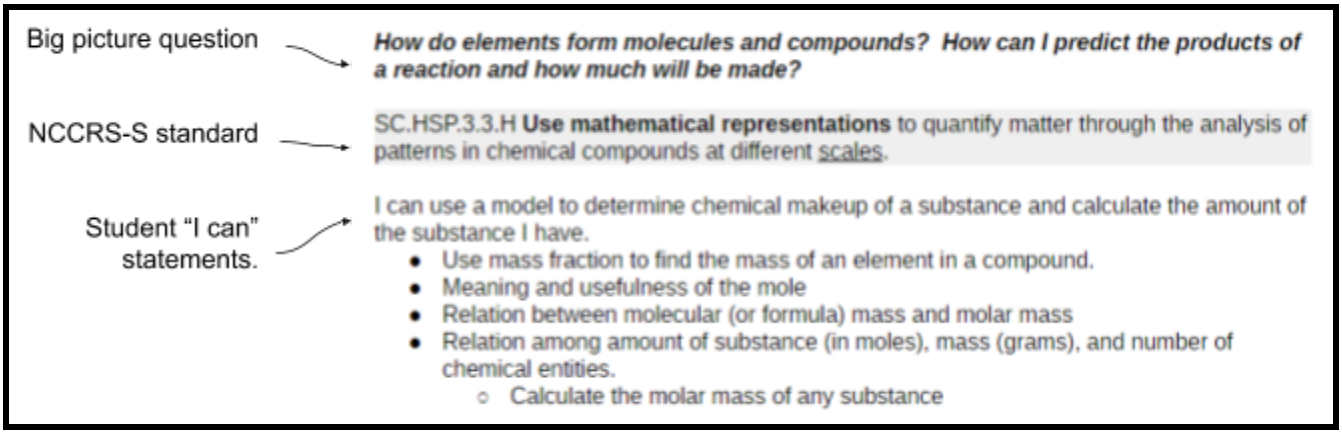
Unit 3 - Stoichiometry Essential Question and Skills

This document shows one method of creating a guiding document to guide students through a unit.

The big picture question guides the students through the unit and provides direction.

The NCCRS-S standard is in grey for students to reference with **SEP**, CCC, and DCI identified.

Following are the “I Can” statements which were taken directly from the chapter from our textbook.



Unit 3 - Stoichiometry Essential Question and Skills

How do elements form molecules and compounds? How can I predict the products of a reaction and how much will be made?

SC.HSP.3.3.H **Use mathematical representations** to quantify matter through the analysis of patterns in chemical compounds at different scales.

I can use a model to determine chemical makeup of a substance and calculate the amount of the substance I have.

- Use mass fraction to find the mass of an element in a compound.
- Meaning and usefulness of the mole
- Relation between molecular (or formula) mass and molar mass
- Relation among amount of substance (in moles), mass (grams), and number of chemical entities.
    - Calculate the molar mass of any substance

I can read a chemical formula and understand what all parts mean.

- Information in a chemical formula

Using mathematical models, I can determine the write the formula for a substance from the amount I have of each element.

- Procedure for finding the empirical and molecular formulas of a compound
    - Use mass percent to find the mass of an element in a given mass of compound
    - Determine the empirical and molecular formulas of a compound from mass % and molar mass of elements

SC.HSP.5.3.C **Use mathematical and/or computational representations** to predict and explain relationships within chemical systems.

I can balance an equation.

- Importance of balancing equations
- Mole-mass-number information
- Relation between amounts of reactants and products

I can determine how much I can expect to get and what will limit how much product I can make.

- Why one reagent limits the yield of products
- The causes of lower-than-expected yields and the distinction between theoretical and actual yield
    - Convert a chemical statement into a balanced equation
    - Write an overall equation from a series of equations
    - Recognize limiting reactant problems and choose the limiting reactant in reactions of pure and dissolved substances
    - Calculate percent yield

I can make a solution with the correct concentration and/or molarity.

- Meanings of concentration and molarity
- The effect of dilution on the concentration of a solute
- How reactions in solution differ from those of pure reactants
    - Calculate molarity and the mass of substance in solution
    - Prepare a dilute solution from a concentrated one