This worksheet will take you through a calculation of molarity of products in solution similar to question 1 on homework 4 and quiz 3. As written, it calls for a large bag of snack-sized Halloween candy (Kit Kat, Hershey's, Reese's, and AlmondJoy). This worksheet could be equally well done with pieces of paper cut into different shapes.

Starting Materials:
1 KitKat → Break apart the sticks to have two KitKat anions charged -1. (3.79g/mol)
1 Hershey's Bar → Break apart the squares to have 4 Hershey's anions charged -1. (7.55g/mol)
Almond Joy → A 2+ metal cation (16.5 g/mol)
Reese's → A 4+ metal cation (17.5 g/mol)

Open your four pieces of candy. Balance the following reaction

___ Reese's$(Hershey's)_4$ + ___AlmondJoy$(KitKat)_2$ → ___Reese's$(KitKat)_4$ + ___ AlmondJoy$(Hershey's)_2$
Answer: 1,2,1,2

Imagine that each candy piece represents a mole (ie: you have 1 mole of Reese's and 4 moles of Hershey's). Now imagine that you crushed Reese's$(Hershey's)_4$ and created a solution in 300.3mL of water in beaker A. Imagine you also crushed up AlmondJoy$(KitKat)_2$ and created a solution in 200.8mL of water in beaker B. Assume that both reactants are completely soluble.

What is the molarity of:
Reese's$(Hershey's)_4$_____
AlmondJoy$(KitKat)_2$_____
Answer: 3.300M, 4.980M

How many ions of Reese's^{4+} are in beaker A?_____
How many ions of Hershey's^{-} are in beaker A? _____
How many ions of Almond Joy^{2+} are in beaker B?_____
How many ions of KitKat^{-} are in beaker B?_____
Answer: 1 mol, 4 mol, 1 mol, 2 mol

Now pour the solutions together into beaker C. A precipitate of Reese's$(KitKat)_4$ falls to the bottom of the beaker.
How many moles of Almond Joy^{2+} are in beaker C?_____
How many moles of Hershey's^{-} are in beaker C?_____
How many moles of the precipitate form at the bottom of beaker C?_____
How many grams of the precipitate form at the bottoms of beaker C? _____
How many moles of KitKat^{-} are in beaker C?_____
How many moles of Reese's^{4+} are in beaker C?_____
Answer: 1 mole, 4 moles, 0.5moles, 0.0153g, 0 moles, 0.5 moles

What is the molarity of:
AlmondJoy^{2+}in beaker C?_____
Hershey's^{-} in beaker C?_____
Precipitate in beaker C?_____
KitKat^{-} in beaker C?_____
Reese's^{4+} in beaker C?_____
Answer: 1.996M, 7.982M, 0M, 0M, 0.9978M