1) Obtain the fractional abundances for the two naturally occurring isotopes of potassium (K). The masses of the isotopes are: $^{39}\text{K}$ 38.963707 amu; $^{41}\text{K}$ 40.961825 amu. The atomic weight of potassium is 39.0983 amu.

2) Chlorine has two natural isotopes, $^{35}\text{Cl}$ and $^{37}\text{Cl}$. Hydrogen reacts with chlorine to form the compound HCl. Would a given amount of hydrogen react with different masses of the two chlorine isotopes? Does this result conflict with the Law of Constant Proportions? Why or why not?

3) Copper (II) sulfate pentahydrate has blue colored crystals. When heated carefully, it produces copper (II) sulfate anhydrous (= no waters), which has green crystals. What are the formulas of these hydrates? If 3.548 g of the pentahydrate yields 2.268 g of the anhydrous compound, how many grams of copper (II) sulfate monohydrate could have been obtained? (Possible if the heating was even more careful.)

4) An element X forms both a dichloride (XCl$_2$) and a tetrachloride (XCl$_4$). Treatment of 10.00 g of XCl$_2$ with excess chlorine forms 12.55 g XCl$_4$. What is the atomic weight of X? What is the identity of X?