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Biomanufaturing Lip Balm Project Reflection

Granite Technical Institute Biomanufacturing students produced lip balm as part of a natural products unit.

As part of this project, students first completed market research, investigating the ingredients in various lip balms already on the market. Part of this research included becoming familiar with the FDA regulations governing both cosmetics and drugs.

Second, students researched the natural ingredients they intended to use in their own lip balm to guarantee their product would be safe- students researched the MSDS sheet information and LD 50 (the amount that will kill half of the animals exposed to that amount) for any essential oils they intended to use.

Students then made their own individual formulations from a basic recommended recipe. During the formulation phase, students needed to perform a number of mathematical calculations including weight/weight % and percent compostion calculations from chemistry, conversions from percentages to ounces, ounces to grams, and metric conversions to microliters. Students needed to use the density of their individually chosen natural ingredients in order to calculate the proper very small measurement of their flavor or essential oils. The students were extremely motivated to 'get their math right", since this was their own individual formulation, and they wanted it to be safe and to succeed. The temptation to copy their neighbors answers was not as strong as their desire to create their own individual formulation of lip balm.

Lab skills that the students learned as part of this exercise included measuring mass using an analytical balance and proper use of micropipettes. Students also learned proper gowning and clean room procedures, and the smaller classes prepared their lip balm in the clean room.

In the final phase of this project , students created and designed their own labels for their lip balm according to the FDA labelling requirements for cosmetics. This final phase again included calculations: calculating the mean, standard deviation and coefficient of variance for the masses of their classes lip balm. The mean mass was reported as the "net weight" on the students labels. Students also listed the ingredients (botanical, INCI approved naming), warnings, and other information required by the FDA.

Althought students initially wanted to just jump in and make lip balm without the prepartory steps, when the students finally did produce their lip balm, they commented that they appreciated and understood why each of the preparatory steps were necessary. They also expressed their eagerness to improve their initial formulations and make another batch of lip balm. Many students even volunteered to help streamline the lip balm manufacturing process and write a Standard Operating Procedure for Lip Balm to use with the Granite District Junior High School students that will visit our class.