

Name: Mendi White

Grade Level/Subject: Probability and Statistics

Topic: Mmmmm...Chocolate! (or m & m Count & Crunch) ... see attachment

Objectives (P.A.S.S.): Probability and Statistics, ratio and proportion, percentages, unit conversions, area, bar graphs, and pie charts.

Introduction: This project uses the different colors of M & M's to incorporate a variety of skills. Therefore, it is best used as an evaluation tool or to reinforce or review. The materials needed include 1 individual bag of M & M's per student or group, 1 1-lb. bag of M & M's, rulers, protractors, colored pencils or markers, and the student handout. This project will take about 3 to 4 class periods to complete so the m&m's will need to be saved at the end of each day. I suggest giving the students a clean piece of paper to put their m&m's on so that they can be eaten at the end of the project.

Instructional process: Give students an overview of the project. They will be using their probability skills to make a prediction on the number of candies for each color in the one-pound bag. They are not to eat any of the candy from their bag. They will be saving these from day to day until the project is finished. Ask them to keep their candy pieces on the clean sheet of paper and to wash their hands prior to working with the candy.

Part 1:

1. Have the students estimate the number of candies in their bag and the quantity of each color. On the chart they are to record their guesses in raw numbers and then calculate the corresponding percentages.
2. Each student or group is then to open their bag and count the actual number of each color and the total candies in the bag. These are to be recorded on the chart and the percentages calculated.
3. The students could create a bar graph representing their data.
4. The next step involves creating a pie chart. Be sure the angle measures are accurate percentages of 360 degrees.

Part 2:

1. Have the students the weight and diameter of a single candy. Make them think on their own how they might figure this one out and try a variety of strategies. The weight of an individual candy can be determined by dividing the number of actual candies by the total weight which is printed on the bag.
2. Step 6 of the project stresses unit conversions. Make sure that students know that, although there are 12 inches in a foot, there are 144 square inches in a square foot. In part 6d, assign each student or group one color to use to answer the question.

Part 3:

1. This part is the statistical study. Have each group share with the class their results and post it in the chart available for the data. Have students then calculate the mean, median, range, and mode for the class data.

2. Students are now asked to predict the quantity of each color in the one-pound bag. Do the calculations on the worksheet.

Part 4: (advanced)

1. For the probability experiment, it is helpful to assign each student or group a different situation to test. Each group will calculate the probability of their assigned situation for the small bag and record the relative frequency after making 50 trials.

Closure: Closure would include reinforcing the topics studied in this section and how the same principles could be used in "real" life... not just with colored candies.

Assessment: Completed tables, charts, and calculations.

Modifications/Accommodations: Modify by grouping students rather than having them work individually.

Reflection: The teacher should complete this project prior to assigning it to the class. This way the students have some sample calculations to see in order to better understand what they have been assigned to do. It also helps to decide which portions of the assignment could or could not be done for that group of students. (Part 4 may be too advanced for lower level classes studying probability as a portion of a chapter.)