M&M Probability

Which M&M color are you most likely to get? If you were to open a bag of Plain M&M's, what color would you most likely get? What color would you least likely get? Whenever you start to use the words "most likely" or "least likely", you are talking about probability.

I. Conducting the Experiment

Because we are not able to count all the different colors of M&M's that were created or will be created, we are not able to calculate the theoretical probability of all M&M's. So instead, we will find the theoretical probability of the M&M's in your individual bag.

1. Take one bag of M&M's and count the total number in the bag. Total is:_____

2. Separate the M&M's into each color.

3. Count how many M&Ms are in each pile and write below.
   Red: _____   Brown: _____

   Green:_____   Yellow:_____

   Blue: _____   Orange:_____

4. Answer the following Questions:
o Which color has the largest quantity?

o Which color has the smallest quantity?

o Is this what you expected to find? Why or why not?

II. Theoretical Probability

1. Fill in table below with information you found earlier.
2. Calculate the probability of picking a certain color of M&M for each category. The probability is found by creating a ratio. (Do you remember what this is?) The number of M&M's in a color is placed in the numerator, the total number of M&M's is placed in the denominator. (Example, If there are 6 red M&M's and 54 total M&M's, the probability of picking a red M&M is 6/54.) Add these values to your table.

2. Convert your fractions into decimals and percentages. Add these values to your table.

Color	Total	Ratio	Decimal	Percent
Total		1	1.0	100%

Notice the bottom row says total. Your columns should add up to equal that final number.

3. Remember, the more likely something is, the closer to 1 the probability will be. Answer the following questions:
• What color is most likely?

• Which one is least likely?

• Are there any that are equally likely? (This means the probabilities are the same.)

III. Predictions
Based on the results of your theoretical probability, how many times do you estimate that you should pick each color? Show your work.

Red: _____   Brown: _____

Green:_____   Yellow:_____

Blue: _____   Orange:_____

IV. Experimental Probability
1. Randomly pick an M&M out of your bag of M&M's 20 times. Keep a tally of the color you pick…

Red: _____   Brown: _____

Green:_____   Yellow:_____

Blue: _____   Orange:_____

2. Calculate the experimental probability of picking a certain color of M&M for each category.

3. Convert your fractions into decimals and percentages. Remember when converting into a decimal you divide the fraction. Also when converting into a decimal you either change the fraction to have a denominator of 100 and the numerator is your percentage OR you multiply the decimal by 100. Add these values to your table.

Color	Total	Ratio	Decimal	Percent
Total		1	1.0	100%

V.) Comparing Theoretical Vs. Experimental Probability
How does the experimental probability compare to the theoretical
probability? Use specific examples from your data.

EXTRA: Research to find out why there was a period of years that
no red M&M's were made. When did they start including red M&M's
in the packages again? Write a paragraph or more to share your
findings on a separate piece of paper.