M & M Project

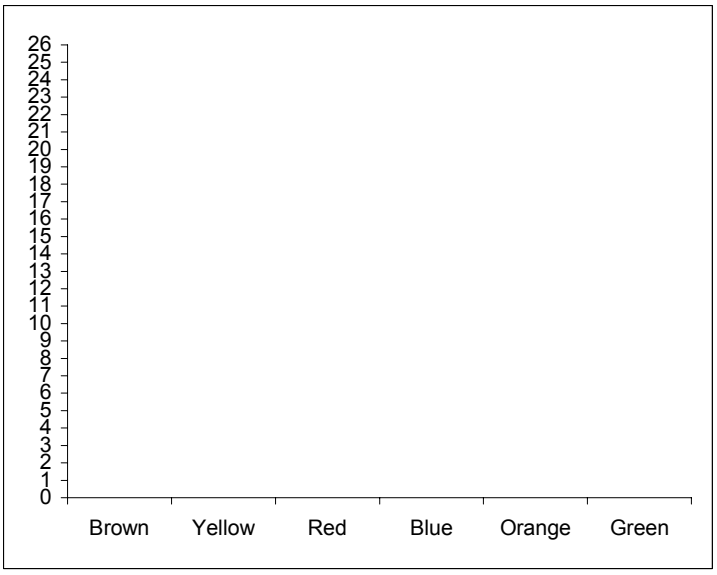
1. Sort the M&Ms by color and record the results in the table below. Also use the total count of M&Ms to determine the percentages of each color in the bag. In the expected column use the advertised color distribution to determine what the percentage of each color should be.

TALLY FOR M&M'S

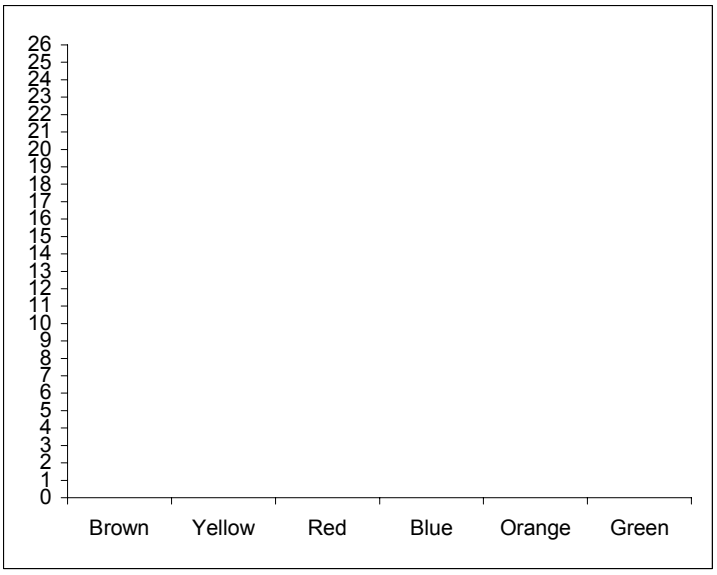
Color	Your M&M's	Percent	Expected M&M's
Brown	_____	_____	0.13 X Total =_____
Yellow	_____	_____	0.14 X Total = _____
Red	_____	_____	0.13 X Total = _____
Blue	_____	_____	0.24 X Total =_____
Orange	_____	_____	0.20 X Total =_____
Green	_____	_____	0.16 X Total = _____
Total	_____		

1. Use the above counts to make two bar graphs: A bar graph for your total count for each color, and a bar graph for the expected total count for each color.

Your Count Bar Graph



Expected Count Bar Graph

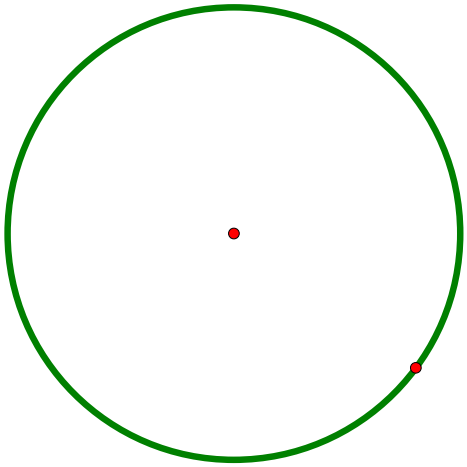


2. Is the bar graph of the expected count exactly like that of your count? Explain in what ways the graphs are different and in what ways they are the same.

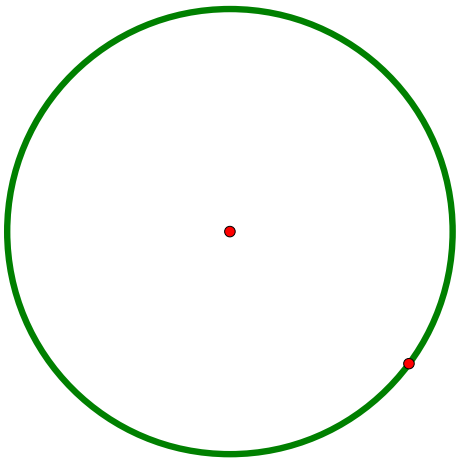
3. Why might your count and the expected counts differ?

4. Use the percentages of each color in your counts to make two pie graphs: One for the percentages by color for your count, a pie graph for the percentages by color for the expected count.

Your Count Pie Graph



Expected Count Pie Graph



Probability

Suppose that you placed the M&Ms back into the package and drew one candy out randomly. Find each of the following probabilities:

1. The candy drawn will be green.

2. The candy drawn will be red.

3. The candy drawn will be green or red.

4. The candy drawn will not be red.

5. The candy drawn will not be green.

6. The candy drawn will neither be red nor green.

M&M Questionnaire

Fill in this questionnaire and build equations to solve.

1. I would have to add (or eat) _____ red pieces of candy to have the same number of red pieces of candy as the expected.	
2. If I doubled the number of blue pieces of candy I have, then I would have _____ blue pieces of candy.	
3. If I tripled the number of yellow pieces of candy I have, I would have _____ more yellow pieces of candy than the expected.	
4. If I added 15 brown pieces of candy to my bag, the expected would have to have _____ more brown pieces of candy for us to have the same number of brown pieces of candy. How many brown pieces of candy do I have?	
5. If I ate 3 of my orange pieces of candy, then put my orange pieces of candy together with the expected orange pieces of candy, we would have _____ orange pieces of candy.	

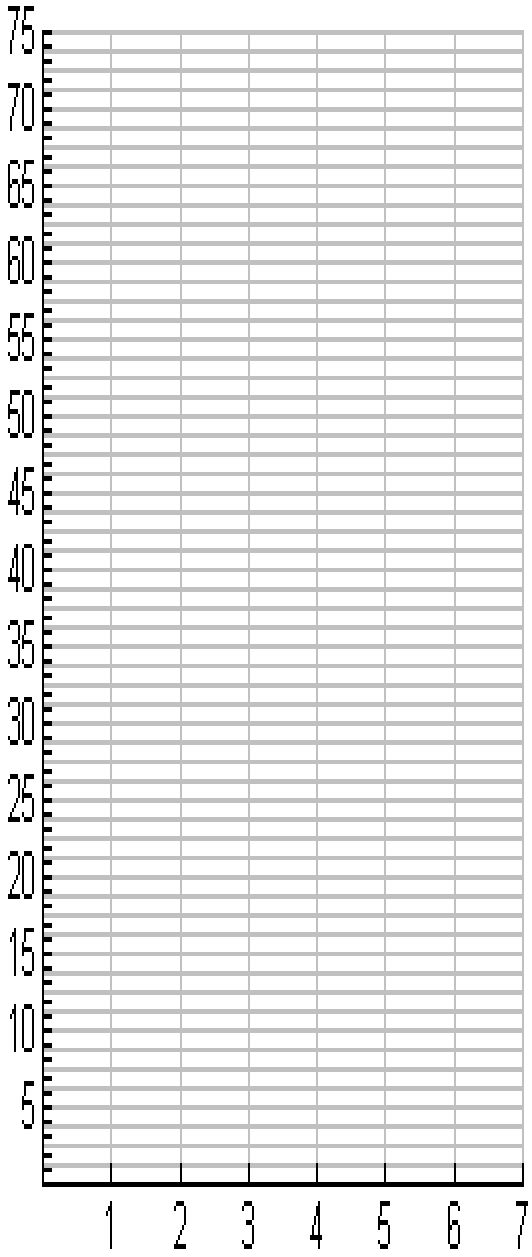
6. Suppose another student had a bag of M&M's exactly like mine. So we each started with the same number of each color candy, then I ate 5 of our red pieces of candy, we would have _____ red pieces of candy left.	
7. My brown, yellow, and green pieces of candy total _____. I have _____ more (fewer) brown pieces of candy than yellow pieces of candy. I have _____ fewer (more) green pieces of candy than yellow pieces of candy. How many brown pieces of candy do I have? How many yellow? How many green?	
8. I have a total of _____ pieces of candy in my bag. I have _____ more (fewer) brown pieces of candy than orange pieces of candy. If I eat all my brown and orange pieces of candy, I will have _____ pieces of candy left.	

What's Up?

1. Record your total number of M&Ms._____
2. Next put all of the M&Ms into your cup and carefully dump them out. Record the number of M&Ms that landed with the m side up._____
3. Dispose of all of the pieces of candy that landed m side up. Place all other M&Ms back into the cup. Shake the cup and carefully dump the pieces of candy out. Again note the number of pieces of candy that landed face up. Repeat this process until there is only one candy remaining. Record your results in the table.

Trial	Number of pieces of candy m side up
0	
1	
2	
3	
4	
5	
6	
7	

4. Plot the above data on the graph provided. Use the trial number as the x-coordinate and the number of pieces of candy m side up as the y-coordinate.


75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
1
2
3
4
5
6
7

5. Does there appear to be a relationship between the trial and the number of M&Ms that land m side up? If so what is that relationship?

6. Find an equation that models the relationship described in question 5.

7. If you start out with 120 M&Ms, predict how many will land m side up on the 3rd trial. Explain your reasoning.

The M&M Matrix

1. You have two bags of M&Ms: one plain and one peanut. Sort the pieces of candy by color and type and enter your result in the matrix below.

$$\begin{array}{c} \\ \textit{Brown} \\ \textit{Yellow} \\ \text{Red} \\ \textit{Blue} \\ \textit{Orange} \\ \textit{Green} \end{array} \begin{array}{c} \begin{array}{cc} \textit{Plain} & \textit{Peanut} \end{array} \\ \begin{bmatrix} & \\ & \\ & \\ & \\ & \\ & \end{bmatrix} \end{array}$$

2. Use scalar multiplication to determine how many of each color and type of candy you would have if you had exactly twice as many of each color and type. Show your work in the matrix below.

$$\begin{array}{c} \\ \textit{Brown} \\ \textit{Yellow} \\ \text{Red} \\ \textit{Blue} \\ \textit{Orange} \\ \textit{Green} \end{array} \begin{array}{c} \begin{array}{cc} \textit{Plain} & \textit{Peanut} \end{array} \\ \begin{bmatrix} & \\ & \\ & \\ & \\ & \\ & \end{bmatrix} \end{array}$$

3. Record your partners original count in the matrix below.

	Plain	*Peanut*
Brown		
Yellow		
Re*d*		
Blue		
Orange		
Green		

4. Use matrix addition to find the total of each color and type of candy for you and your partner. Enter the results in the matrix below.

	Plain	*Peanut*
Brown		
Yellow		
Re*d*		
Blue		
Orange		
Green		

5. If you had exactly 3 times as many of each color and type of candy and your partner had exactly 5 times as many of each color and type of candy, then how many of each color and type would the two of you have together? Use matrix operations and enter your results in the matrix below.

	Plain	*Peanut*
Brown		
Yellow		
Re*d*		
Blue		
Orange		
Green		