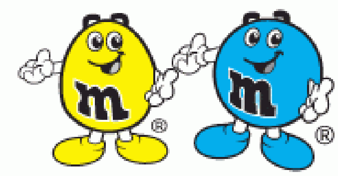
m&m's & Statistics

A statistical population is a group of similar things that a scientist is interested in learning about.

In this lab, what is our statistical population? ____

Statistical populations are composed of similar individuals, but these individuals often have different characteristics.

How are the individuals in the population the same? ____________ How are they different? ____________



- ➔ open up a fun-size bag of plain m&m's
- ➔ count how many of each color are in the bag
- ➔ record the number in the appropriate space according to your table number
- ➔ collect data from around the room to fill in the rest of the chart

A mean is the number obtained by adding up the data for a given characteristic and dividing this sum by the number of individuals.

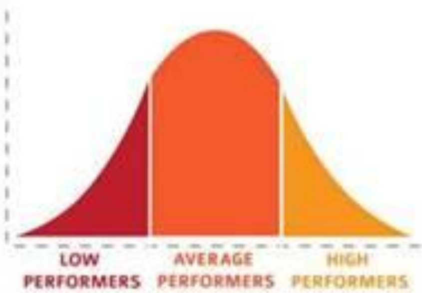
The mean provides a single numerical measure for a population and allows for easy comparison.

- ➔ total the number of each color for the class
- ➔ divide by 6 to calculate the mean for each color

Averages of colors of m&m's in a fun size bag

color	table 1	table 2	table 3	table 4	table 5	table 6	total	mean
red								
yellow								
blue								
green								
brown								
orange								
total in bag								

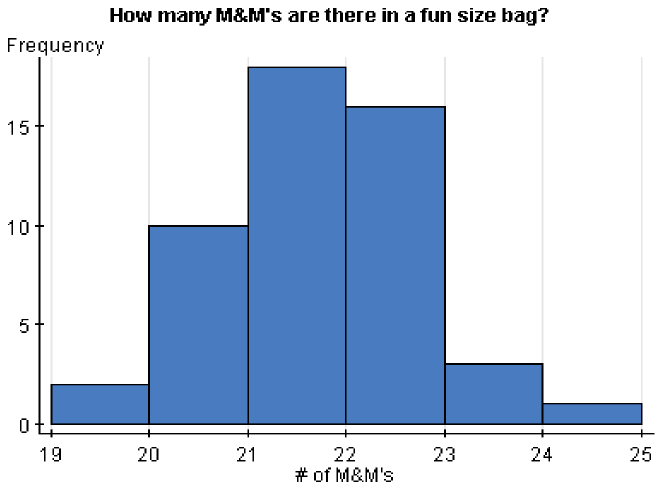
- ➔ make sure you have filled in the last row: total number of m&m's in each bag
- ➔ PUT YOUR m&m's BACK IN THE BAG!



Distribution is the relative arrangement of the members of a statistical population, and is usually shown in a graph.

A bell shaped curve indicates a normal distribution where the data is grouped symmetrically around the mean.

Below is a graph showing the distribution of the frequency of numbers of m&m's found in a fun size bag.



- ➔ does this illustrate a bell curve? _______
- ➔ put an x on the graph to show where your number in your bag is located
- ➔ according to this graph, what is an average number of m&m's found in a "normal" bag? _______
- ➔ is your number more or less than average?_______
- ➔ are "normal" people more likely to have more or less than average in a bag of m&m's?______
- ➔ this graph is a couple of years old – why do you think that our bags have less m&m's than average?

____

Probability is the likelihood that a possible future event will occur in any given instance of the event. Probability is usually expressed as a number between 0 and 1 and written as a decimal rather than as a fraction.
The closer a probability is to 1, the more likely it is to happen!

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.

- ➔ reach into the bag without looking and pick out one m&m
- ➔ use tally marks to record, on the chart, which color m&m was picked.
- ➔ put the M&M back in the bag.
- ➔ repeat steps 1-3 forty-nine more times. (You will make 50 different picks total.)
- ➔ record the data below.

m&m color	tally of times picked	total number of times picked
red		
yellow		
blue		
green		
brown		
orange		

use the equation: Probability = $\frac{\text{Total \# of Color}}{\text{Total \#}}$

You can keep your number as a decimal, in which case your total probabilities should add up to one, or convert to a percent in which case your total probabilities should add up to 100

YOUR RESULTS		
color	total number of times color picked / total number of times tried (50)	probability
red		
yellow		
blue		
green		
brown		
orange		
Total probability should = --→		1 or 100%

refer back to the table on the first page for your totals of each color and total in the bag
for this chart you will calculate the percentage of each color in your bag, which in this case, is also the probability

Theoretical Results – What SHOULD have happened!		
color	actual number of each color / total number of m&m's – (how many you had in your bag)	probability
red		
yellow		
blue		
green		
brown		
orange		
Total probability should = --→		1 or 100%

Remember, the more likely something is, the closer to 1 (or 100%) the probability will be.

M&M Probability – Results

1. Compare the two (yours & theoretical) results. Are they the same? If they are not, the same, are they close?

2. Should the numbers for the "Actual Results" be close to the "Theoretical Probability"?

3. What does this tell you about what should happen (probability & what actually happens (reality)?

4. Why was it important to have 50 different "picks" from the bag & not just one or two?

5. Explain, as if you were explaining it to a student who was absent, how to calculate the probability of an event.

In this section we also discussed the following models:
Physical models are three-dimensional models you can touch.
Maps and charts are the most common examples of graphical models.
Conceptual models are verbal or graphical explanations for how a system works, or is organized.
Mathematical models are one or more equations that represent the way system or process works.

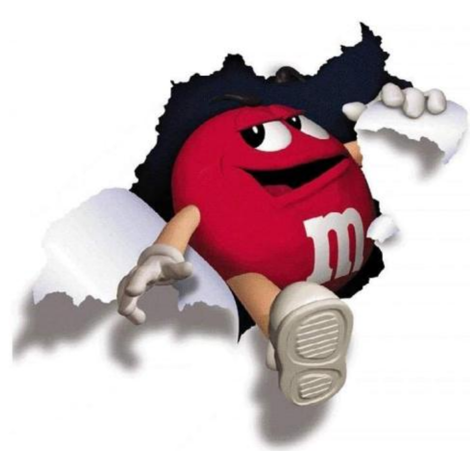
Explain how this type of model was used in this lab, or write "not used in lab" if it was not

Physical Model: ____

Graphical Models: ____

Conceptual Model: ____

Mathematical Models: ____



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