

MATH 312 – m & m ACTIVITY

We are going to use graphs to display data and explore relationships among the data. m & m plain chocolate candies come in six colors: brown, green, orange, yellow, red, and blue. Work in groups of approximately 5 –6 people.

Before you open the bag of m&m's , answer the following:

1. Which color of m&m's do you think will occur most often in the bag? Why?
2. Which color of m&m's do you think will occur most often in your sample? Why?
3. Which color of m&m's do you think will occur least often in the bag? Why?
4. Which color of m&m's do you think will occur least often in your sample? Why?

Each person in the group should now take a sample of m&m's using the scoop provided. Do not eat any of the m&m's. Arrange the m&m's in your sample on Graph 1 found on the next page. This type of graph is sometimes called a *real graph* because the statistical data are displayed using real objects.

5. Record the number of m&m's of each color, and the total number in your sample.

Brown: ____, Orange: ____, Blue: ____, Green: ____, Red: ____, Yellow: ____, Total: ____

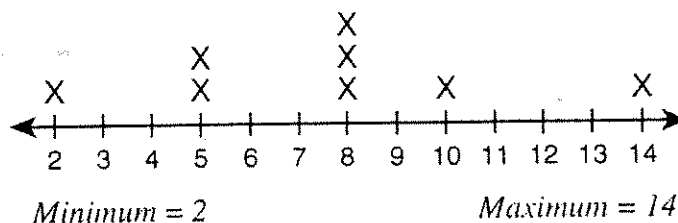
6. What color occurred most often and what color occurred least often in your sample? How do these colors compare with your predictions?
7. As you remove the candies from the graph, color its circle the appropriate color. This type of graph is called a pictograph because each picture represents one or more of the objects being compared.
8. Compare your pictograph with your classmates' pictographs. Describe any similarities and differences and explain why these may have occurred.
You may now eat your sample of m&m's.

We are now going to make line plots for each color of m&m. Line plots provide a quick, simple way to organize numerical data. They work best when there are fewer than 25 data points.

9. We will be collecting information for our group beginning with the yellow m&m's.
 - a. What is the maximum number of yellow m&m's in anyone's sample?
 - b. What is the minimum number of yellow m&m's in anyone's sample?
 - c. Title one of the line plots on the following page as "yellow", and use the minimum and maximum values found above to label the scale on the number line.
 - d. Each time a person reports the number of yellow m&m's in his or her sample, record an x above that number of the number line as shown in the example below.

Example:

Yellow m&m's®



10. Repeat exercise #9 for each color of m&m's.
11. Use the line plots to describe the data for each color. Rather than just looking at individual numbers, describe the shape of the data – any patterns or special features such as clusters or gaps in the data and isolated data points – that tell how the data are distributed.
12. Use the line points to find the total number of each color of m&m's in the samples:
 Brown: _____, Orange: _____, Blue: _____, Green: _____, Red: _____, Yellow: _____, Total: _____
13. There are approximately 450 m&m's in a 14oz. bag of candy. Use the information from problem number 12 to predict the number of each color that you would expect to find in the entire bag.
 Brown: _____, Orange: _____, Blue: _____, Green: _____, Red: _____, Yellow: _____, Total: _____
14. Describe the procedure you used to make your predictions.

19. Which graph, the pictograph or the bar graph, was easier to construct? Why?

20. Which graph is easier to read? Why?

We will now look at our totals, and using this information as our new sample data, we will try to make predictions about the entire population of m&m plain chocolate candies.

21. Record the number of each color of m&m's in the entire bag in the table below. Determine the percent of each color. These percentages are your predictions for the actual percent of each color m&m made.

Color	Brown	Green	Orange	Red	Blue	Yellow	Total
Number							
Percent							

22. Assuming that there are 450 m&m's in a bag, that would lead us to believe that there is about a 5% error factor involved. Make a confidence interval for the actual percentage of each color of m&m.

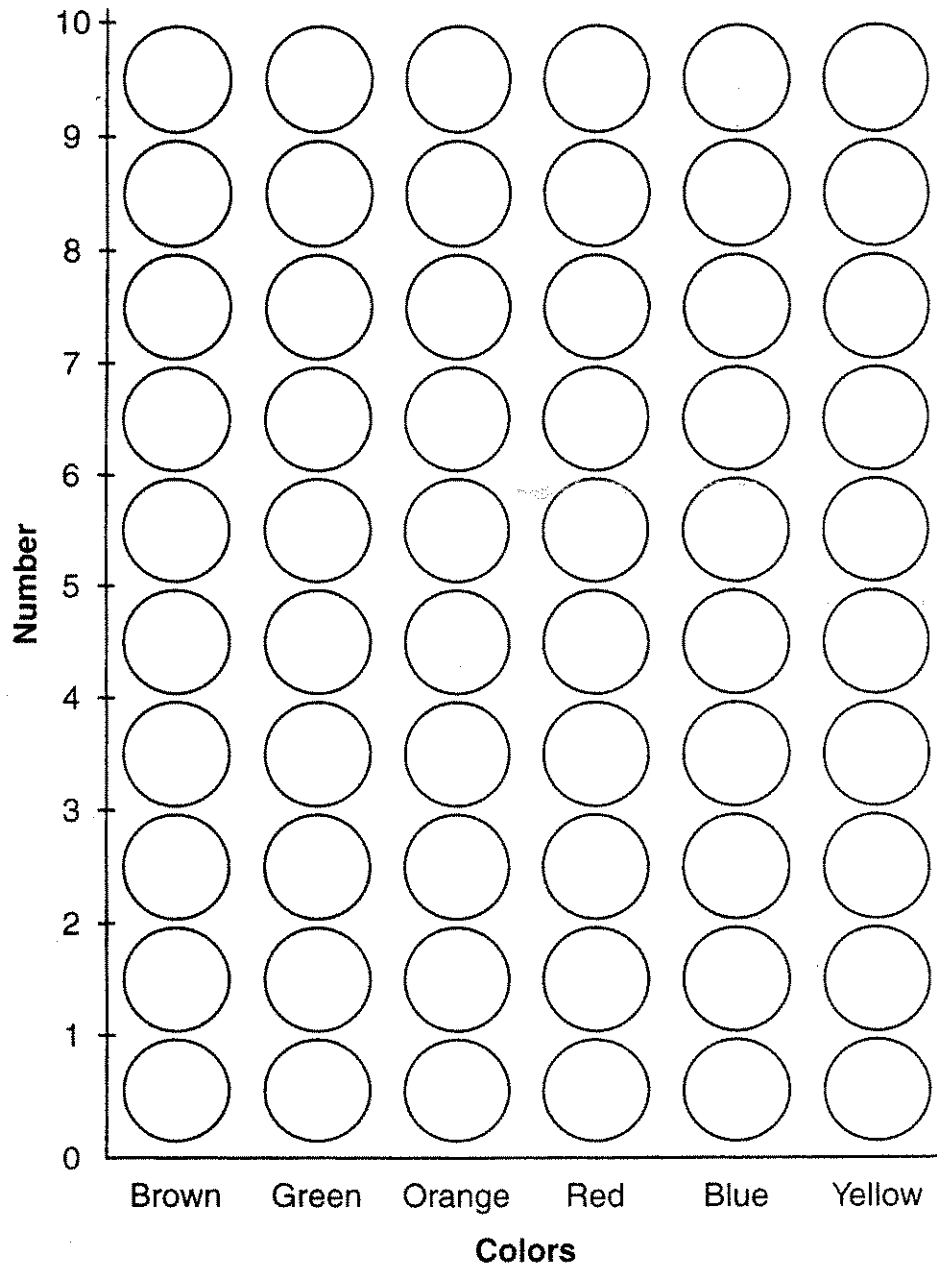
Brown: _____, Orange: _____, Blue: _____, Green: _____,

Red: _____, Yellow: _____

23. According to Mars, Inc., the manufacturers of m&m's plain chocolate candies, there are ~~30% brown, 20% yellow, 20% red, 10% orange, 10% blue, and 10% green~~ candies in each bag. How do your predictions compare? Are there any percentages that you would disagree with? Why?

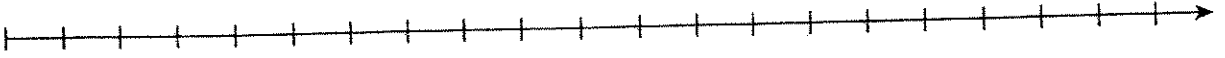
13% brown
14% yellow
13% red
24% blue
20% orange
16% green

Graph 1: Frequencies of *m&m's*[®]



LINE PLOTS

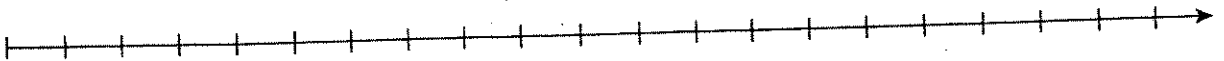
_____ m&m's



_____ m&m's



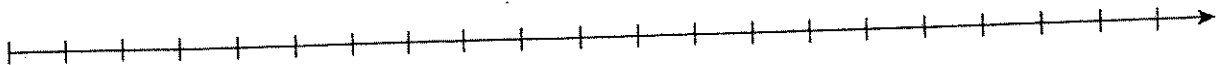
_____ m&m's



_____ m&m's



_____ m&m's



_____ m&m's



MATH 311 – WRITE-UP FOR CANDY-LAB

Write an analysis of your findings for candy-lab. This should be in paragraph form (not numbered), typed, not to exceed 2 pages in length. Discuss any items you found interesting or relevant to the class. Be sure to include the following:

1. Talk about the different graphs used on the handout. (i.e. Which are easier to make? To read? What are they used for?)
2. Talk about sample size. (i.e. Did your feelings about the percentage of each color of m&m change from your original predictions as you sampled in #3? Did they change from #3 to #12? How did your predictions in #13 compare to the actual numbers in # 14? How did your final predictions in #21 compare to the actual percentages? What was your best predication and why?)
3. Talk about your final predictions and the confidence intervals that you found for each color. Do you agree with the percentages claimed by the company or are there colors that you think are produced in a different amount?
4. Talk about how this activity related to what we have discussed in class about sampling. (i.e. How did the samples for other members of your group compare to your sample and what did this tell you? What did you learn about sampling from this activity? Can samples give good predictions?)
5. Attach your document to the completed candy-lab packet. Make sure you have answered all questions in the packet.