LessonTitle: M&Ms Melt in &our Mouth — Pre 3.1c

Utah State Core Standard and Indicators

Summary

Students predict, then collect and organize data regarding the colors of M&Ms in a bag. They create circle graphs. They combine samplings and compare sampling accuracy to actual percentages of colors in a bag. They also examine theoretical probability and solve probability problems related to selecting colors of M&Ms from a bag. .

Enduring Understanding

Probability is a part of our lives. We collect data, organize it, and make conjectures based on our findings. The larger the sampling the closer (usually) our experimental probability will be to theoretical probability.

Essential Questions

What is probability and how do we use it in our lives?

Skill Focus

- Basic probability
- Use of fractions, ratio, and percentage to represent probability

Vocabulary Focus

"We talked about circle graphs, bar graphs, histograms, x axis, y axis, theoretical and experimental probability. Some of the vocabulary got lost in the lesson."

Assessment

Materials

Launch ideas:

"We figured the M&Ms would be motivation enough and the lesson provides a great way to introduce circle graphs."

Explore ideas:

"For the explore part, we realized it would be important for the students to listen to instructions and take accurate data so they can compare with other groups."

Summarize ideas:

"We wanted to ask the students what we were really doing? What were we comparing? What ratios are we using?"

Application:

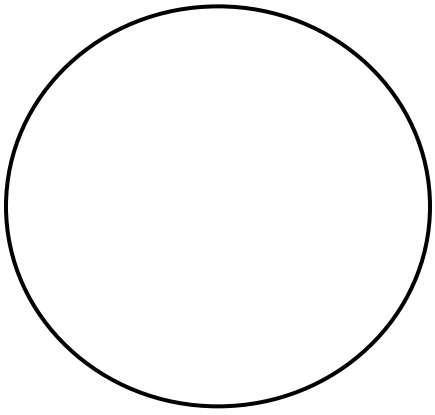
"[Great for] reading and interpreting graphs."

They Melt in Your Mouth

1. DON'T OPEN THE PACKAGE YET!
2. Guess how many M&Ms will be in your package. _____
3. Guess what color occurs most often in your package? _____ Least often? _____
4. Open the package, but DON'T EAT YET! Total M&Ms _____

   Red _____ Green _____ Brown _____
   Yellow _____ Orange _____ Blue _____
5. Which color occurs the most often? _____ least often?_____
6. Is this the same as your neighbor's? _____
7. Why do you think you these colors may be the same or different?
8. Create a circle graph using your M&Ms. Arrange the M&Ms in a circle on a clean sheet of paper with like colors together. Arrange them in this order so we can compare later: 1) orange, 2) red, 3) yellow, 4) blue, 5) brown, 6) green.

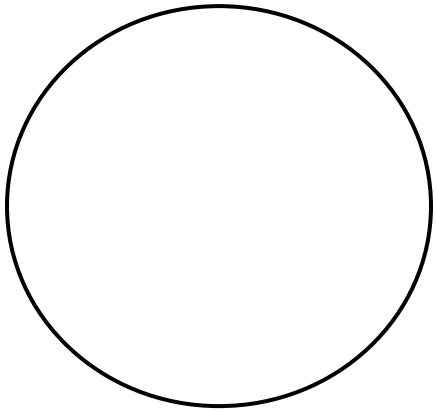
   Trace the circle, estimate the center. Draw lines from the center to the edge of the circle between colors. DON"T EAT yet. Place the M&Ms in a bag and set aside.
9. Now create the circle graph on your TI-73 graphing calculator.
   - Create a color list. (Be certain to place quotations around the first entry, "orange."—this tells the calculator the list is a category list.)
   - Make a second list for the numbers.
   - Plot the graph.
   - Sketch the graph below. (Use colored pencils or crayons to match colors)
   - Label the graph and give it a title. Label the color sections with percentages.
   - Change the plot to a bar graph and record below. Label appropriately.



10. Combine the data with 4 other groups. Record the data below.

	Red	Purple	Brown	Yellow	Orange	Blue
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
Totals	_____	_____	_____	_____	_____	_____

11. Make a list of group data totals in your calculator. Create a circle graph and record below on the left. Include all labels. **The graph at the right is the actual percentages used by M&M company.**



12. Compare the three circle graphs, your data, 5 groups data and the actual. What conclusions can you draw.

13. If you were to draw the M&Ms out of a bag what is the theoretical probability for drawing the following:

Red M&M	P(R) = _____
Green M&M	P(G) = _____
Brown M&M	P(B) = _____
Yellow M&M	P(Y) = _____
Orange M&M	P(O) = _____
Blue M&M	P(Bl) = _____

12. Place all of the M&Ms in a paper bag. Draw M&Ms out of your bag 50 times and mark your result on the tally sheet. Replace the M&M you drew after each try.

Tally Sheet

RED	***GREEN***	***BROWN***	***YELLOW***	***ORANGE***	***BLUE***
Total:	***Total:***	***Total:***	***Total:***	***Total:***	***Total:***

13. If you were to draw the M&Ms out of a bag what is the experimental probability for drawing the following:
    Red M&M P(R) = _____
    Green M&M P(G) = _____
    Brown M&M P(B) = _____
    Yellow M&M P(Y) = _____
    Orange M&M P(O) = _____
    Blue M&M P(Bl) = _____

14. How does this experimental probability compare with your theoretical probability in question 12? Why may they be different? If they are different, what could you do to make your experimental probability closer to your theoretical probability?

15. Select two different colored M&Ms from your package and eat them. How does this change the theoretical probability of drawing an *orange* M&M?

16. Eat all of the *brown* M&Ms in your package. What is the probability of drawing a brown M&M? What is the probability of drawing a *green* M&M? Why are these probabilities different from the probabilities found in question 12?

17. Write a paragraph (at least three ***complete*** sentences) explaining what you have learned about probability from doing this activity. (Eat Your M&Ms if you wish.)