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Coordinating Seminar: Hands-on Activity
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**M & M’s with percentages and mean, median, and mode**



**Goal:** The student will develop an understanding of percentages, decimals, and fractions.
 The student will develop an understanding of mean, median, and mode.

**Objectives:**

Given a cup of approximately 100 M&M’s, the students will count and record the total amount of *each* M&M in their graphs, then calculate their percentages using fractions, with at least 85% accuracy.

 Given the data from the table, the students will calculate the mean, median, and mode of each color and fill in the table, with at least 85% accuracy.

**Materials:**

* 1 19.2 OZ bag of Large Milk Chocolate M&M’s
* 6 cups labeled 1-6
* Worksheet
* Pencil
* Napkin

**Procedure:**

1. Get into groups of 2 or 3
2. Each group will receive 1 cup, the cup will be labeled 1-6
3. The cup will include approximately 100 M&M’s. Dump the M&M’s out of the cup and on to the napkin.
4. Count the number of Red M&M’s first, by placing them back into your cup.
5. Record the number that you counted in the column of your cup number and row of Red.
6. Repeat steps 4&5 for the number of Orange, Yellow, Green, Blue, and Brown M&M’s.
7. Add up the total number of M&M’s in your cup, and record it in the row labeled total that is located at the bottom of the table.
8. Fill in all of the information that your classmates have gathered for the rest of the cups.

**Questions:**

1. Which color of M&M’s do you think they put most of in the bag? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which color do you think they have the least of in the bag? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Do you think that they evenly distribute the colors? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Let’s find out!**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Color of M&M’s | Cup 1 | Cup 2 | Cup 3 | Cup 4 | Cup 5 |  Cup 6 |  | **Total** |
| Red |  |  |  |  |  |  |  |  |
| Orange |  |  |  |  |  |  |  |  |
| Yellow |  |  |  |  |  |  |  |  |
| Green |  |  |  |  |  |  |  |  |
| Blue |  |  |  |  |  |  |  |  |
| Brown |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| **Total:** |  |  |  |  |  |  |  |  |

Now that we have all of our information, we can fill in our next chart in order to find the percentage of each color that we found in our bag of M&M’s.

1. Fill in the number of Total Red M&M’s as your numerator to the Total number of M&M’s in the bag as your denominator, in the fraction column next to Red.
2. Repeat Step 9 for the Fraction of Orange, Yellow, Green, Blue, and Brown M&M’s.
3. Calculate the decimal of Red M&M’s by plugging the fraction in to your calculator, then record your decimal to the nearest ten thousandths in the Decimal column.
4. Repeat Step 11 for the Decimal of Orange, Yellow, Green, Blue, and Brown M&M’s.
5. Calculate the percentage of Red M&M’s by multiplying the decimal by 100, then record your answer to the nearest whole number in the percentage column.
6. Repeat Step 13 for the Percentage of Orange, Yellow, Green, Blue, and Brown M&M’s.
7. Discuss the results with your partner. Was your prediction correct? Have you ever noticed that there were more of one color than another? Was the color with the least amount the one you predicted?
8. Answer the conclusion questions on the next page.

|  |  |  |  |
| --- | --- | --- | --- |
| Color | Fraction | Decimal(nearest ten thousandths) | Percentage(nearest whole number) |
| Red |  |  |  |
| Orange |  |  |  |
| Yellow |  |  |  |
| Green |  |  |  |
| Blue |  |  |  |
| Brown |  |  |  |

 **Conclusion:**

1. Which color has the highest percentage in a bag of M & M’s? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which color has the lowest percentage in a bag of M & M’s? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Are they distributed evenly? How you do you know? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Were your predictions from above correct? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Does M & M’s percentages match ours? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Extra Practice:**

*Directions:* Given the Fraction below find the decimal and round to the nearest ten thousandth.

1. $\frac{8}{15}$ =\_\_\_\_\_\_\_\_\_\_ 2) $\frac{64}{197}$ = \_\_\_\_\_\_\_\_\_\_\_\_

3) $\frac{97}{574} $= \_\_\_\_\_\_\_\_\_ 4) $\frac{14,856}{78,120}$ = \_\_\_\_\_\_\_\_\_\_\_

*Directions:* Give the Decimal below, calculate the percentage to the nearest whole number.

1. .5429 = \_\_\_\_\_\_\_\_\_\_\_\_
2. .8932 = \_\_\_\_\_\_\_\_\_\_\_\_
3. .3114 = \_\_\_\_\_\_\_\_\_\_\_\_
4. .7423 = \_\_\_\_\_\_\_\_\_\_\_\_

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**M&M Math**

*Directions*: Using the information in the chart below in order to calculate the mean, median, and mode for each color of M&M’s.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Color of M&M’s | Cup 1 | Cup 2 | Cup 3 | Cup 4 | Cup 5 |  Cup 6 |  | **Total** |
| Red | 22 | 10 | 13 | 11 | 23 | 10 |  | 89 |
| Orange | 10 | 10 | 11 | 14 | 9 | 18 |  | 72 |
| Yellow | 14 | 7 | 17 | 14 | 13 | 9 |  | 74 |
| Green | 25 | 23 | 23 | 23 | 24 | 22 |  | 140 |
| Blue | 24 | 31 | 19 | 30 | 23 | 25 |  | 152 |
| Brown | 10 | 13 | 5 | 20 | 12 | 16 |  | 76 |
|  |  |  |  |  |  |  |  |  |
| **Total:** | 105 | 94 | 88 | 112 | 104 | 100 |  | 603 |

**Mean**

R: \_\_\_\_\_\_\_\_\_\_\_\_\_ O: \_\_\_\_\_\_\_\_\_\_\_\_\_ Y: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

G: \_\_\_\_\_\_\_\_\_\_\_\_\_ Bl: \_\_\_\_\_\_\_\_\_\_\_\_\_ Br: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Median**

R: \_\_\_\_\_\_\_\_\_\_\_\_\_ O: \_\_\_\_\_\_\_\_\_\_\_\_\_ Y: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

G: \_\_\_\_\_\_\_\_\_\_\_\_\_ Bl: \_\_\_\_\_\_\_\_\_\_\_\_\_ Br: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Mode**

R: \_\_\_\_\_\_\_\_\_\_\_\_\_ O: \_\_\_\_\_\_\_\_\_\_\_\_\_ Y: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

G: \_\_\_\_\_\_\_\_\_\_\_\_\_ Bl: \_\_\_\_\_\_\_\_\_\_\_\_\_ Br: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Findings:**

1. Which M&M color had the largest mean? Median? Mode?

	1. Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Mode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Which M&M color had the smallest mean? Median? Mode?

	1. Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Mode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Which method do you think the M & M Company uses to determine their percentages of colors in each bag? Why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
**Extra Practice:**
4. What is the mean, median, and mode of the numbers: 84, 59, 87, 68, 92

	1. Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Mode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What is the mean, median, and mode of the numbers: 147, 203, 147, 159, 176, 182

	1. Mean: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Median: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Mode: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_