

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

## Do Skittles or M&Ms have more orange candies?



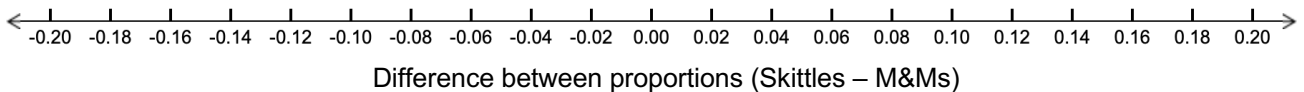
Mr. Wilcox believes that Skittles have a higher proportion of orange candies than M&Ms, while Mrs. Gallas believes the opposite. Who is correct?



1. Take an SRS of 50 Skittles and an SRS of 50 M&Ms. Calculate the proportion of orange candies in each sample and find the difference between proportions (Skittles – M&Ms).

Skittles: \_\_\_\_\_ M&Ms: \_\_\_\_\_ Difference (Skittles – M&Ms): \_\_\_\_\_

2. Write the difference on a sticker dot and place on the dot plot at the board. Copy the class dot plot below.



3. What does each dot represent?

4. For the dotplot above, make a prediction about the following:

Shape:

Center (mean):

Variability (SD):



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A Google search reveals that 21.6% of Skittles are orange and 20% of M&Ms are orange.

5. Describe the sampling distribution of the sample proportion of orange for Skittles ( $X$ ) and the sampling distribution of the sample proportion of orange for M&Ms ( $Y$ ) for samples of size 50.

	Skittles ( $X$ )	M&Ms ( $Y$ )
Shape:		
Mean:		
SD:		

6. Describe the sampling distribution of the difference between proportions of orange Skittles and M&Ms ( $X - Y$ ).

Shape:

Mean of difference between proportions:

Standard deviation of the difference between proportions:



7. Mr. Wilcox and Mrs. Gallas calculated a difference between proportions of 0.08 from their samples. Calculate the probability of getting this difference in proportions or higher.

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## The Sampling Distribution of $\hat{p}_1 - \hat{p}_2$

Important ideas:

### Check Your Understanding

At Westville High School there are 315 seniors and 389 juniors. 65% of the seniors have parking passes and 42% of the juniors have parking passes. The statistics teacher selects a SRS of 30 seniors and a separate SRS of 30 juniors. Let  $\hat{p}_S - \hat{p}_J$  be the difference in the sample proportions of seniors and juniors that have parking passes.

- What is the shape of the sampling distribution of  $\hat{p}_S - \hat{p}_J$ ? Why?
- Find the mean of the sampling distribution.
- Calculate and interpret the standard deviation of the sampling distribution.
- What is the probability that the difference in sample proportions (senior – junior) of students with parking passes is greater than 30%?