What is the true proportion of Blue M&M’s in a bag of plain M&M’s?

1. Guess the proportion of blue M&M’s in a bag of plain M&M’s and write your guess here: \_\_\_\_\_\_\_\_\_\_
2. What information might help you provide a more educated guess?

*Possible answers…having a bag of M&M’s we could examine (a sample)*

*Looking on the website to see if they publish this information…*

1. With some new information, what is your second guess? (It could be the same as your first) \_\_\_\_\_\_\_\_\_\_

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| BIG IDEA: *Even though we have a sample statistic (the proportion of blue M&M’s in our one bag of M&M’s), this doesn’t mean that the parameter (the TRUE proportion of blue M&M’s in bags of M&M’s) is EXACTLY equal to my sample statistic.**There is probably some wiggle room. Let’s give ourselves some room for error. Let’s give a range of proportions for our guess. But…let’s be smart about how much wiggle room, or room for error we give ourselves.**Let’s do a SIMULATION. (Since we can’t afford to buy lot of bags of M&M’s)* |

We are going to ***assume*** that the true proportion of blue M&M’s is equal to our sample proportion which is \_\_\_\_\_\_.

1. Assuming this proportion of blue M&M’s, SIMULATE how many blue M&M’s will be in a bag of 60 M&M’s and calculate the proportion in your “bag.” Use the space below to record your data.

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| Trial | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Color |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| Trial | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| Color |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| Trial | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| Color |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

*Option 1: Have the chart above here for students to help them with the organizational aspect.*

*Option 2: Let students figure out a way to organize their own data*

1. What is the proportion of Blue M&M’s from your simulation? \_\_\_\_\_\_\_\_\_\_\_\_
2. Record your sample proportion on the board when prompted by your teacher.

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| 1. Sketch the graph of the class’ sample proportions here:
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| 1. Based on the graph, what is a reasonable range for your estimate of the true proportion of blue M&M’s? Explain your reasoning.

*Answers will vary. Should be roughly about .14 to .36…this is about 2 standard deviations away from our sample proportion of 0.25. This should be where many/most of the data points lie from the class’ data.* |
| 1. How much “wiggle room” did you give yourself? This is called your *Margin of Error*

*Answers will vary. Should be roughly about 0.11 in each direction…this is about 2 standard deviations away from our sample proportion of 0.25 in each direction* |
| 1. Summarize your findings. That is, what is your estimate for the true proportion of blue M&M’s?
2. *Based on my sample, I think the true proportion of blue M&M’s is between \_\_\_\_\_\_ and \_\_\_\_\_\_\_*
3. *Based on my sample, I think the true proportion of blue M&M’s is between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
4. *Based on my sample, I think the interval \_\_\_\_\_\_\_\_\_\_\_\_\_\_ contains the true proportion of blue M&M’s*
5. *Write their own here*
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