Which way will the Hershey Kiss land?

When you toss a Hershey Kiss, it sometimes lands flat and sometimes lands on its side. What proportion of tosses will land flat?

Each group of four selects a random sample of 50 Hershey’s Kisses to bring back to their desks. Toss the 50 Kisses and then calculate the proportion that land flat. Let \( \hat{p} \) = the proportion of the Kisses that land flat.

1.) What is your point estimate for the true proportion that land flat? ________

2.) Identify the population, parameter, sample and statistic.

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<th>Population:</th>
<th>Parameter:</th>
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<th>Sample:</th>
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3.) Was the sample a random sample? Why is this important?

4.) What is the formula for calculating the standard deviation of the sampling distribution of \( \hat{p} \)?

5.) What condition must be met to use this formula? Has it been met?

6.) We don’t know the value of \( p \) (that’s the whole point of a confidence interval) so we will use \( \hat{p} \) instead. Calculate the standard deviation.

7.) Would it be appropriate to use a normal distribution to model the sampling distribution of \( \hat{p} \)? Justify your answer.
8.2 Estimating a Population Proportion

8.) In a normal distribution, 95% of the data lies within _____ standard deviations of the mean. This value is called the critical value. Use table A or InverseNorm to find these critical values:

80% of the data lies within ______ standard deviations of the mean

90% of the data lies within ______ standard deviations of the mean

95% of the data lies within ______ standard deviations of the mean

99% of the data lies within ______ standard deviations of the mean

9.) Calculate the margin of error for a 95% interval by multiplying the critical value and standard deviation you found. Show your work.

10.) Find the 95% confidence interval using point estimate +/- margin of error.

11.) Add your interval to the graph on the board. Sketch the graph below.

12.) What do you think is the true proportion of kisses that land flat is?
Check Your Understanding

Sleep Awareness Week begins in the spring with the release of the National Sleep Foundation’s annual poll of U.S. sleep habits and ends with the beginning of daylight savings time, when most people lose an hour of sleep. In the foundation’s random sample of 1029 U.S. adults, 48% reported that they “often or always” got enough sleep during the last 7 nights.

1. Identify the parameter of interest.

2. Check if the conditions for constructing a confidence interval for $p$ are met.

3. Find the critical value for a 98% confidence interval. Then calculate the interval.

4. Interpret the interval in context.