Name: _____ Hour: _____ Date: _____

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.

   Population: _____ Parameter: _____

   Sample: _____ Statistic: _____

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.

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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?

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Constructing a Confidence Interval for *p*

Important ideas:

Check Your Understanding

What do you want to be when you grow up? According a nationwide survey of a random sample of 1000 kids under the age of 12, some kids want to be a ninja, a dragon keeper, a dancing unicorn, and even an octopus. Fifty-five of the 1000 kids want to be a doctor. We would like to use this study to find a 98% confidence interval for the true proportion of kids who want to be a doctor.

a. Identify the parameter of interest.

b. Check if the conditions for constructing a confidence interval for *p* are met.

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

d. Interpret the interval in context.