 **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 = 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:

1. Was the sample a random sample? Why is this important?
2. What is the formula for calculating the standard deviation of the sampling distribution of?
3. What condition must be met to use this formula? Has it been met?
4. We don’t know the value of *p* (that’s the whole point of a confidence interval) so we will useinstead. Calculate the standard deviation.
5. Would it be appropriate to use a normal distribution to model the sampling distribution of ? Justify your answer.
6. 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

1. Calculate the **margin of error** for a 95% interval by multiplying the critical value and standard deviation you found. Show your work.
2. Find the 95% confidence interval using **point estimate +/- margin of error**.
3. Add your interval to the graph on the board. Sketch the graph below.
4. What do you think is the true proportion of kisses that land flat is?

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.

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.