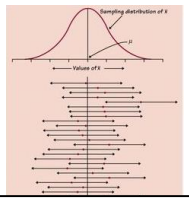
Name: _____ Date: _____ Period: ____ #: ___

Lesson 8.1: Day 2: What does "95% confident" mean?



In this Activity, you will use the *Confidence Intervals* applet to learn what it means to say we are "95% confident" that our confidence interval captures the true mean.

1. Go to http://digitalfirst.bfwpub.com/stats_applet/stats_applet_4_ci.html (I will text it to you too.) Set the confidence level to 95% and the sample size to 5.

2. Click "Sample" to choose an SRS and display the resulting confidence interval. The confidence interval is displayed as a horizontal line segment with a dot representing the sample mean in the middle of the interval. The true mean (μ) is the green vertical line.

   Did the first confidence interval capture the true mean?

   Repeat this 10 times and sketch what you see to the right. How many of the intervals capture the true mean?

3. "Reset" and then take a total of 100 confidence intervals (sample 25 four times). How many out of 100 captured the true mean? Is this surprising? Why?

4. Watch your confidence intervals as you drag the confidence level from 95% to 99% (don't "Reset). What happens to the intervals when the confidence level is increased? Why does this make sense?

5. "Reset", then sample 100 times at an 80% confidence interval. How many of the intervals capture the true mean?

Interpret the **confidence level**:

6. Now we will see what happens when we adjust the sample size. Change the sample size from 5 to 50 and sample for 1 interval. Then change it to 250 and sample for 1 interval. What happens to the interval when the sample size is increased? Why?

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Lesson 8.1 Day 2– Interpreting Confidence Level

Important ideas:

Check Your Understanding

As part of a project about response bias, Ellery surveyed a random sample of 25 students from her school. One of the questions in the survey required students to state their GPA aloud. Based on the responses, Ellery said she was 90% confident that the interval from 3.14 to 3.52 captures the mean GPA for all students at her school.

(a) Interpret the confidence level.

(b) Explain what would happen to the length of the interval if the confidence level were increased to 99%.

(c) How would a 90% confidence interval based on a sample of size 200 compare to the original 90% interval?

(d) Describe one potential source of bias in Ellery's study that is not accounted for by the margin of error.