***Section 3.2: Understanding and Interpreting Confidence Intervals***

***Activity: Coin Flipping***

Information for Instructors: This requires some advance planning. Bring to class lots of coins – pennies are fine. Have each student (or group of students) flip a coin 25 times and record the number of heads and tails. They should then compute the proportion of heads in their sample. See the next page for a student handout to use. Before they report results, have them describe the likely sampling distribution. What shape will it have and where will it be centered? Hopefully they will remember bell-shaped and centered at the population parameter, which is p = 0.5 in this case. Then have them compare results.

Wait until after you have introduced margin of error to do this activity (or do the first part of this activity and then introduce margin of error and then do the rest of the activity.) Tell students that the margin of error for finding a sample proportion in this situation is 0.20. Have each student or group use this margin of error and their sample proportion to calculate an interval estimate for the true proportion of heads.

Remind them that this method is designed to capture the true population proportion most of the time (in this case, about 95% of the time). End by asking the class how many of their interval estimates did capture the true proportion of p = 0.5. It should be a large percentage!

Emphasize that different samples give different interval estimates, but the margin of error is designed to ensure that this method will capture the true proportion 95% of the time. That is what it means to say that we are 95% confident that an interval we find from one sample contains the population parameter!

After having students do the physical activity, this activity can be simulated many times on StatKey if desired, to bring the point home.

(Note that only students who had more than 18 or less than 7 heads will miss the true population parameter of 0.5.)

***Section 3.2: Understanding and Interpreting Confidence Intervals***

***Activity: Coin Flipping***

Flip the coin 25 times and record below the number of heads and tails:

|  |  |
| --- | --- |
| Heads | Tails |
|  |  |

Calculate the proportion of heads in your 25 flips:

Sample proportion = \_\_\_\_\_\_\_\_\_\_\_\_\_

If you did this many, many times, describe the shape and center of the sampling distribution of sample proportions of heads in 25 flips of a coin.

**The margin of error for finding a sample proportion in this situation is known to be 0.20.** (We’ll see how to find this later in the course.) Use this margin of error to find an interval estimate for the true proportion of heads in flipping a coin.

Interval estimate is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does your interval estimate contain the true proportion of 0.5? \_\_\_\_\_\_\_\_\_

Compare your answer with others in your class. Do most of the interval estimates contain the true proportion?