

SRHS – SRiS – Chapter 11 Review

[#1] Mrs. Piehl is wondering if SRHS students would like to have another school-wide rally this school year. She asks all 30 students in her 4th Student Government class about their preference. Of these 30 students, 93% responded in favor of another school-wide rally this school year.

- (a) Identify the population
- (b) Identify the sample.
- (c) What type of sampling was used?
- (d) Explain why this sampling method is biased.
- (e) Do you think the percentage of all students who favor another school-wide rally this school year is greater or less than 93%? Explain your reasoning.
- (f) What type of sampling method should Mrs. Piehl have used and why?

[#2] What percentage of basketball players have exaggerated contact to ‘draw’ a foul from the opposing team? To find out, league officials will randomly select 50 of the 530 active NBA players and interview them by e-mail. Of these 50 players, suppose that 43% admitted that they had exaggerated contact to ‘draw’ a foul from the opposing team during a game.

- (a) Explain how you would randomly select 50 players from this population.
- (b) Do you think that the percentage of all NBA players who have exaggerated contact to ‘draw’ a foul is less than, greater than, or about the same as 43%? Explain your reasoning.

[#3] In 2021, the SRHS Environmental Action Club surveyed a random sample of 79 SRHS students about their waste disposal habits and found that $34/79 = 43.0\%$ said they have put something in the trash that should have been recycled at least once in the last year.

- (a) Do you think that exactly 43.0% of all SRHS students have put something in the trash that should have been recycled at least once in the last year? Explain your reasoning.
- (b) The standard error of the estimated percentage is 5.6%. Interpret the standard error.
- (c) Use the standard error from part (b) to calculate a 95% confidence interval for the percentage of all SRHS students have put something in the trash that should have been recycled at least once in the last year.

- (d) Interpret the confidence interval you constructed in part (c).
- (e) Based on the confidence interval from part (c), is there convincing evidence that more than half of all SRHS students have put something in the trash that should have been recycled at least once in the last year? Explain your reasoning.
- (f) Explain how the survey could reduce the margin of error for their estimate.

[#4] In the Fall 2021 semester of the SRHS Basketball Skills class, Mr. Patrick made 30 of his 50 attempted free throws, for a success rate of 60.0%.

- (a) Was 60.0% Patrick's *PERFORMANCE* or his *ABILITY* to make a free throw? Explain your reasoning.
- (b) The approximate standard error of Patrick's estimated shooting percentage was 6.9%. Use the standard error to calculate a 95% confidence interval for Patrick's *ABILITY* to make a free throw the Fall 2021 semester of the SRHS Basketball Skills class.
- (c) Interpret the confidence interval you constructed in part (b).
- (d) Is there convincing evidence that Patrick's *ABILITY* to make a free throw was greater than 50% during the Fall 2021 semester of the SRHS Basketball Skills class? Explain your reasoning.

[#5] In the Fall 2021 season of SRHS golf Mr. Jones played every afternoon with his team. In 60 rounds of golf his average score was 74.3 strokes.

- (a) Do you think Mr. Jones' *ABILITY* to score was exactly 74.3 strokes during the Fall 2021 season? Explain your reasoning.
- (b) The approximate standard error of the estimated mean is 2.8 strokes. Interpret the standard error.
- (c) Calculate a 95% confidence interval for Mr. Jones' *ABILITY* to score in the Fall 2021 season.
- (d) Interpret the confidence interval you constructed in part (c).
- (e) Based on your interval, is it plausible that his *ABILITY* to score was less than 72 strokes during the Fall 2021 season? Explain your reasoning.