Unit Topic: __Inference for Quantitative Data: Slopes_____
Grade level:__AP Stats___ **Length of lesson: ___5 days_____**

Stage 1 – Desired Results

Content Standard(s):
- HSS.ID.A.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).
- HSS.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- HSS.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- HSS.ID.B.5 Summarize categorical data for two categories in two way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
- HSS.ID.B.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- HSS.IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
- HSS.IC.A.2 Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?
- HSS.IC.B.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
- HSS.IC.B.4 Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
- HSS.IC.B.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
- HSS.IC.B.6 Evaluate reports based on data.
- HSS.CP.A.1 Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").

Understanding (s)/goals	**Essential Question(s):**
Students will understand:	• How can there be variability in slope if the slope statistic is uniquely determined for a line of best fit?
• Given that variation may be random or not, conclusions are uncertain.	• When is it appropriate to perform inference about the slope of a population regression line based on sample data?
• An interval of values should be used to estimate parameters, in order to account for uncertainty.	
• The t-distribution may be used to model variation	• Why do we not conclude that there is no correlation between two
• Significance testing allows us to	

make decisions about hypotheses within a particular context	variables based on the results of a statistical inference for slopes?

Student objectives (outcomes):

Students will be able to:

- Check the conditions for performing inference about the slope β of the population (true) regression line.
- Interpret the values of a, b, s, and SE_b in context, and determine these values from computer output.
- Construct and interpret a confidence interval for the slope β of the population (true) regression line.
- Perform a significance test about the slope β of the population (true) regression line.

Stage 2 – Assessment Evidence

Performance Task(s):	Other Evidence:
	•

Stage 3 – Learning Plan

Learning Activities: