Introduction to Data Science (IDS)

California Common Core Mathematics Standards addressed by IDS

Unit 1

Focus Statistics CCSS-M

S-ID 1.   Represent data with plots on the real number line (dotplots, histograms, and boxplots).

S-ID 2:   Use statistics appropriate to the shape of the data distribution to compare center (median, mean) of two or more different data sets (measures of spread will be studied in Unit 2).

S-ID 3:   Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S-ID 5.   Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

S-ID 6.   Represent data on two quantitative variables on a scatterplot, and describe how the variables are related.

S-IC 6.   Evaluate reports based on data.*
*This standard is woven throughout the course. It is a recurring standard for every unit.

Focus Standards for Mathematical Practices

SMP-3.   Construct viable arguments and critique the reasoning of others.

SMP-5.   Use appropriate tools strategically.

Unit 2

Focus Statistics CCSS-M

S-ID 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.

S-ID 3:   Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S-ID 4.   Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Understand that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

S-IC 2.   Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.

S-IC 6.   Evaluate reports based on data.*
*This standard is woven throughout the course. It is a recurring standard for every unit.

S-CP 2.   Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

S-CP 9.   (+) Use permutations to perform [informal] inference.
            *This standard will be addressed in the context of data science.

Focus SMPs

SMP-4.   Model with mathematics.

SMP-5.   Use appropriate tools strategically.

Unit 3

Focus Statistics CCSS-M

S-IC 1.   Understand statistics as a process for making inferences about population parameters
            based on a random sample from that population.

S-IC 3.   Recognize the purposes of and differences among sample surveys, experiments, and
            observational studies; explain how randomization relates to each.

S-IC 6.   Evaluate reports based on data.*
            *This standard is woven throughout the course. It is a recurring standard for every unit.

Focus SMPs

SMP-1.   Make sense of problems and persevere in solving them.

SMP-4.   Model with mathematics.

SMP-8.   Look for and express regularity in repeated reasoning.

Unit 4

Focus Statistics CCSS-M

S-IC 2.   Decide if a specified model is consistent with results from a given data-generating
            process, e.g., using simulation.

S-ID 6.   Represent data on two quantitative variables on a scatter plot, and describe how the
            variables are related.
               a. Fit a function to the data; use functions fitted to data to solve problems in the
            context of the data. Use given functions or choose a function suggested by the context.
            Emphasize linear models.
               b. Informally assess the fit of a function by plotting and analyzing residuals.
               c. Fit a linear function for a scatter plot that suggests a linear association.

S-ID 7.   Interpret the slope (rate of change) and the intercept (constant term) of a linear model in
            the context of the data.

S-ID 8.   Compute (using technology) and interpret the correlation coefficient of a linear fit.

S-IC 6.   Evaluate reports based on data.*
            *This standard is woven throughout the course. It is a recurring standard for every unit.

Focus SMPs

SMP-2.   Reason abstractly and quantitatively.

SMP-4.   Model with mathematics.

SMP-7.   Look for and make use of structure.