

Probability & Statistics CCSS Alignment and Pacing Guide

Revised 8/17/16

Section/Topic	# of Days	Relevant CCSS and Learning Targets
Chapter 2 – Descriptive Statistics		
2.1 Frequency Distributions and their Graphs	2	S.ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots). Pare this section down. Eliminate frequency polygon, Pareto chart, pie chart.
2.2 More Graphs and Displays	1	S.ID.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.
2.3 Measures of Central Tendency	2	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).
2.4 Measures of Variation	1	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).
2.5 Measures of Position	1	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).
Review and Test	2	
Chapter 9 – Correlation and Regression		
9.1 Correlation	2	S.ID.8 Compute (using technology) and interpret the correlation coefficient of a linear fit.

9.2 Linear Regression	2	S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
9.3 Measures of Regression and Prediction Intervals	2	S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. Can spend less time on this if you have them find margin of error (E) using the calculator (not by hand). Teacher discretion based on how much time you have.
Review and Test	2	
Chapter 3 - Probability		
3.1 Basic Concepts of Probability and Counting	2	S.CP.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”). Optional – spend one day before this lesson familiarizing kids with a deck of cards and have them play Gin Rummy. Use Elizabeth’s handout and video.
3.2 Conditional Probability and the Multiplication Rule	2	S.CP.3 Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B., S.CP.8 Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$, and interpret the answer in terms of the model.
3.3 The Addition Rule	2	S.CP.7 Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.
3.4 Additional Topics in Probability and Counting	2	S.CP.9 Use permutations and combinations to compute probabilities of compound events and solve problems.
Review and Test	2	
Movie: “21”	2	Can show this after Chapter 3 or after Chapter 4, depending on how it fits with the schedule. Or you can just not show it if you are short on time.

Game: LIFE	2-3	Optional (if you have time). Use Michael's "Expectations of Life" worksheet. If kids don't get all the way to the end of the board, that's okay; stop them whenever you need to and have them compute their expected value.
Chapter 4 – Discrete Probability Distributions		
4.1 Probability Distributions	2	S.MD.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions
4.2 Binomial Distributions	2	S.MD.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions
4.3 More Discrete Probability Distributions	2	S.MD.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions
Review and Test	2	
Chapter 5 – Normal Probability Distributions		
5.1 Intro to Normal Distributions and the Standard Distribution	2	S.MD.1 Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions, 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. Recognize 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.
5.2 Normal Distributions: Finding Probabilities	2	S.MD.3 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. 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. Recognize 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.
5.3 Normal Distributions: Finding Values	2	S.MD.3 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. 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. Recognize 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.
5.4 Sampling Distributions and the Central Limit Theorem	2	S.MD.3 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.
5.5 Normal Approximations to Binomial Distributions	2	S.MD.3 Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.
Review and Test	2	
Chapter 6 – Confidence Intervals		
6.1 Confidence Intervals for the Mean (Large Samples)	1	S.IC.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.
6.2 Confidence Intervals for the Mean (Small Samples)	1	S.IC.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.
6.3 Confidence Intervals for Population Proportions	1	S.IC.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.
Review and Test	2	
Chapter 7 – Hypothesis Testing (This is a new addition, so the timeline is tentative. The placement for this section is also tentative. It could also go after Chapter 5)		
7.1 Introduction to Hypothesis Testing	2	Okay to leave out Type 1 and Type 2 errors. But definitely do p-values, making a conclusion, and interpreting the conclusion. S.IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

7.2 Hypothesis Testing for the Mean (Large Samples)	2	S.IC.A.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
Quiz (no test) over 7.1 & 7.2	1	This quiz is not written yet.
Chapter 1 – Introduction to Statistics and Experimental Design		
1.1 An Overview of Statistics	1	S.IC.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
1.2 Data Classification	1	S.IC.1 Understand statistics as a process for making inferences about population parameters based on a random sample from that population. Eliminate the data classification part. Do section 1.1 and 1.2 together in one day.
1.3 Experimental Design	1	S.IC.3 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
Review and Test	1	Optional
Mini-Project		
Mini Project	5	Optional – can be combined with the Final Project. Have seniors collect their own data on a smaller scale and do presentation. Then have Juniors do the Final Project only. Or, if you have enough time, they all do it.
Final Project	15-20 days	S.IC.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., S.IC.5 Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. See Lia, Elizabeth, or Matt for accompanying materials.