

Greater Brunswick Charter School Algebra 1 Curriculum

CONTENT AREA: Mathematics

Course: Algebra I

UNIT #: 5

UNIT NAME: Descriptive Statistics

STUDENT LEARNING OBJECTIVES		CORRESPONDING CCSS	
1	Represent data on the real number line (i.e. dot plots, histograms, and box plots) and use statistics, appropriate to the shape of the data distribution, to interpret and compare center and spread in the context of the data (account for effects of outliers)	S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
		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	Summarize and interpret categorical data for two categories in two-way frequency tables; recognize associations and trends in the data.	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.
3	Represent and describe data for two variables on a scatter plot, fit a function to the data, analyze residuals (in order to informally assess fit), and use the function to solve problems. <i>Uses a given function or choose a function suggested by the context. Emphasize linear and exponential models.</i>	S.ID.6a	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. <i>Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.</i>
4	Interpret the slope and intercept of a linear model in the context of the data; compute (using technology) and interpret the correlation coefficient of a linear fit	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.
5	Distinguish between correlation and causation.	S.ID.9	Distinguish between correlation and causation.

Major **Supporting** **Additional** (identified by PARCC Model Content Frameworks) **Bold Type indicates grade level fluency requirements.** (Identified by PARCC Model Content Frameworks).

Selected Opportunities for Connections to Mathematical Practices

1. Make sense of problems and persevere in solving them. *

2. Reason abstractly and quantitatively.

SLO 5 Examine several related events to determine if the relationship is correlation or causation. Ex. Watching TV and getting a low score on a test.

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

4. Model with mathematics. *

5. Use appropriate tools strategically.

SLO 5 Compute the correlation coefficient for a linear model using technology.

6. Attend to precision.

SLO 3 Create data displays and give oral or written descriptions, in context, using explicit language.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

*MP.1 and MP.4 are overarching practices relevant to Algebra 1. (PARCC Model Content Frameworks)

All of the content presented in this course has connections to the standards for mathematical practices.

Bold type identifies possible starting points for connections to the SLOs in this unit.

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
1	Readiness for statistics		To determine background knowledge for statistics unit	<i>What do I know that I need to understand statistics?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.745-746
2	Samples and Studies		To recognize samples, randomness, and bias	<i>How can I tell a study is statistically reliable?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-1 p.747-751
3	Samples and Studies		To recognize samples, randomness, and bias	<i>How can I tell a study is statistically reliable?</i>	<i>Thinking adults need these skills to determine on their own whether to believe something or not.</i>	<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-1 p.752-753
4	Samples and bias		To evaluate studies and conclusions	<i>How can I tell when a study has been altered to yield a desired outcome instead of a true result?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-1 p.755-756
5	Data sets and parameters	1	To analyze data sets for mean, mean absolute deviation, standard deviation, and variance	<i>What do I use to analyze a set of data to find their average, its spread, and how it is spread?</i>	<i>This is some heavy statistics. Take your time. Use plenty of examples. But always ensure the context of the situation is understood and the students understand what each statistical measure is saying about the data.</i>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-2 p.757-760
6	Data sets and parameters	1	To analyze data sets for mean, mean absolute deviation, standard deviation, and variance	<i>What do I use to analyze a set of data to find their average, its spread, and how it is spread?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-2 p.761-762
7	Data sets and parameters	1	To analyze data sets for mean, mean absolute deviation, standard deviation, and variance	<i>What do I use to analyze a set of data to find their average, its spread, and how it is spread?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-2 p.763
8	Data distribution	1	To use graphs of data sets to better understand their meaning	<i>What to different types of distributions look like when they are plotted?</i>	<i>You want them to be able to recognize symmetric and skewed distributions. Take time to ensure they can all hand box and whisker plots and can interpret them like required in #12-14 in text problems</i>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-3 p.764-768
9	Data distribution	1	To use graphs of data sets to better understand their meaning	<i>What to different types of distributions look like when they are plotted?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-3 p.769

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10	Data distribution	1	To use graphs of data sets to better understand their meaning	<i>What to different types of distributions look like when they are plotted?</i>	<i>Take an extra day to work in groups so those who get it can bring along those who don't yet.</i>	<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-3 p.768-770
11	Comparing different sets of data	1	To identify differences in data by comparing statistical measures	<i>How can I talk intelligently about the differences between two situations?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-4 p.771-775
12	Comparing different sets of data	1	To identify differences in data by comparing statistical measures	<i>How can I talk intelligently about the differences between two situations?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-4 p.776-777
13	Comparing and analyzing data sets	1	To determine mastery of early unit content	<i>Do I know this well enough to know what to use in real situations?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.779
14	Comparing and analyzing data sets	1	Assessment			<ul style="list-style-type: none"> • Review • Assessment 	
15	Slope-intercept form of a line		To determine the slope and y-intercept of a line	<i>How much do I remember from earlier in the year?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.246
16	Scatter Plots and Lines of Fit	1, 3	To determine the best line of fit for a set of data	<i>How does a line approximation tell me about a set of data?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 4-5 p.247-251
17	Scatter Plots and Lines of Fit	1, 3	To determine the best line of fit for a set of data	<i>How does a line approximation tell me about a set of data?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 4-5 p.252
18	Correlation and Causation	5	To determine if two events are dependent or independent	<i>How can I tell when something causes something else to happen?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 4-6 p.254 Some possibly humorous graphs to prove the point

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19	Correlation and Causation	5	To determine if two events are dependent or independent	<i>How can I tell when something causes something else to happen?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	More examples
20	Regression and median-fit lines	3, 4	To create equations for the best line of fit to approximate new values	<i>What kind of functions can I make to approximate new values in my data?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 4-6 p.255-259
21	Regression and median-fit lines	3, 4	To create equations for the best line of fit to approximate new values	<i>What kind of functions can I make to approximate new values in my data?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 4-6 p.259-261
22	Scatter plots, lines of best fit, correlation, causation	3, 4, 5	To determine mastery of key concepts of unit	<i>Do I know how and when to use my knowledge?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.275, 277 #5-16
23	Scatter plots, lines of best fit, correlation, causation	3, 4, 5	Assessment			<ul style="list-style-type: none"> • Review • Assessment 	
24	Simulations	2	To calculate the probabilities in simulations	<i>How can I predict how something is going to happen and sound reasonable?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-5 p.780-783
25	Simulations	2	To calculate the probabilities in simulations	<i>How can I predict how something is going to happen and sound reasonable?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-5 p.784-785
26	Permutations and combinations	NA	To use permutations and combinations to understand situations	<i>How does the order of things make a difference in what may happen?</i>	<i>These aren't in the SLOs for this unit, but they are in the book and you have time for them.</i>	<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-6 p.786-789
27	Permutations and combinations	NA	To use permutations and combinations to understand situations	<i>How does the order of things make a difference in what may happen?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-6 p.790-791

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
					Whole Group	Small Group / Stations	
28	Compound events	NA	To find probabilities of dependent and independent events	<i>How can I have a better idea of what is likely to happen?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-7 p.793-797
29	Compound events	NA	To find probabilities of dependent and independent events	<i>How can I have a better idea of what is likely to happen?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-7 p.798-799
30	Two-way Frequency tables	2	To determine the probability of something happening based on what has happened in the past	<i>How can I use a frequency table to predict the future?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.801-802
31	Probability distributions		To use a graph to help see the probability of an occurrence	<i>How does seeing the data help me understand the data?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-8 p.803-806
32	Probability distributions	1	To use a graph to help see the probability of an occurrence	<i>How does seeing the data help me understand the data?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-8 p.807-808
33	The Normal Curve	1	To use the normal distribution of a set of data to predict the likelihood of an occurrence	<i>How does the normal curve help me predict what will happen?</i>		<ul style="list-style-type: none"> • Lesson/Guided Practice • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 12-8 p.810-811
34	Simulations, permutations, combinations, compound events, frequency tables, distributions	1, 2	To determine mastery of content and skills	<i>Do I know when to use these tools?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.813-816
35		1, 2	To determine mastery of content and skills	<i>Do I know when to use these tools?</i>		<ul style="list-style-type: none"> • Independent Practice • Intervention/Enrichment • I-Ready 	GlencoeAlg1 p.817
36		1, 2	Assessment			<ul style="list-style-type: none"> • Review • Assessment 	

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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<u>Word Wall Candidates</u>							
	Population		Sample		Bias	Observational study	Experiment
	Statistic		Parameter		Standard deviation	Distribution	Symmetric distribution
	Theoretical probability		Experimental probability		Simulation	Permutation	Combination
	Compound event		Independent events		Dependent events	Mutually exclusive	Random variable
	Probability distribution		Expected value		Normal distribution	Statistical inference	Bivariate data
	Scatter plot		Joint frequency		Marginal frequency	Conditional relative frequency	

Day	Topic	SLO	Learning Objectives	Essential Questions	Suggested Student Activities		Possible Resources
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Authentic Application

Your goal: To survey the characteristics of a group of people

Your role: Statistical predictor

Your audience: Show your classmates the best playground ever

The situation: You are conducting a survey that will enable you to predict an outcome using a line of best fit.

What to do:

1. Invent a question that requires two numerical answers.
2. Collect data from at least 30 people.
3. Draw a scatter plot of your data (you may use Excel if you know how).
4. Graph the line of best fit on your scatter plot.
5. Describe the correlation if there is one (negative, positive, none) and explain why the correlation makes sense or doesn't. If there isn't a clear correlation, explain why that could be true.

Your Product: A poster containing the following:

1. The question(s) you asked
2. The data you collected in a table (i.e. people's answers to your questions...should be anonymous)
3. The graph of the scatter plot with the line of best fit
4. A description of the correlation in paragraph form
5. Neatness counts! Make sure your project is neat, legible, creative, colorful, etc.

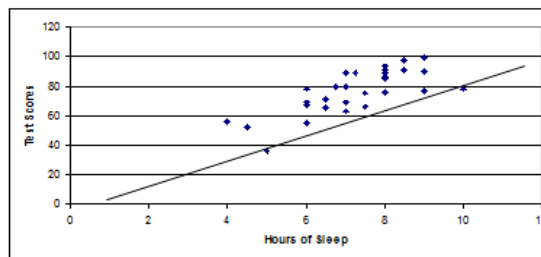
Examples:

Question: How many hours of sleep did you get the night before your history test, and what was your history test score?

Data (you should have 30 or more points of data):

Hours of Sleep	Test Scores
6	69
8	91
7	80
6.5	71
4.5	52
7	69
8	86
9	99
8.5	97
6	78
7.5	66
6.75	80
7.25	89
6	55
9	77

Scatter Plot (done with Excel):



Description: This is where you write whether there was a correlation and explain why the correlation makes sense or doesn't. If there isn't a clear correlation, explain why that could be true.

Success Criteria: Scoring rubric:

