Unit 01: Exploring One-Variable Data

Content Area:
Course(s):
Time Period: **Year**
Length: **180**
Status: **Published**

Unit 1

Unit Title:	Exploring One-Variable Data
Suggested Duration:	**4 weeks**

Interdisciplinary Connections

Interdisciplinary Connections
Reading and Writing Companion Standards for History, Social Studies, Science and Technical Subjects ▪ Grades 9-10 ▪ Grades 11-12 **Math Practices**: https://www.nj.gov/education/standards/math/Index.shtml **Science Practices**: https://www.nj.gov/education/standards/science/Index.shtml Find and paste appropriate Companion Standards or Practices here.

Real world Data will be used as part of each of the Learning Activities. Once the basic concepts and skills are Mastered, each activity and problem will use this knowledge and these skills to connect Mathematics to another discipline.

Technology Integration

Technology Integration
Northern supports the integration of the SAMR Model: a framework which extends learning through the use of technology. The installation of interactive boards, the purchase of softwares and subscriptions, and the investment in 1:1 laptops and various other instructional technologies are examples of Northern's commitment to enhancing students' learning and preparing the 21st century learner for college and careers.

Extensive use of TI-84, Stapplet, Google Classroom, AP Classroom, Desmos, and Khan Academy.

Standard(s) Addressed

Statistical Practices:

1. Formulate Questions: Determine an investigative question for a statistical study.

2. Collect Data: Identify and justify methods for collecting data and conducting statistical inference.

3. Analyze Data: Construct representations of data and calculate numerical statistical outputs.

4. Interpret Results: Interpret results and justify conclusions and methods.

Course Topics:

1.1 Introducing Statistics: What Can We Learn from Data?

1.2 Variables

1.3 Tabular Representation and Summary Statistics for One Categorical Variable

1.4 Graphical Representations for One Categorical Variable

1.5 Graphical Representations for One Quantitative Variable

1.6 Descriptions for One Quantitative Variable Distributions

1.7 Summary Statistics for One Quantitative Variable

1.8 Graphical Representations of Summary Statistics for One Quantitative Variable

1.9 Comparisons of the Distributions for One Quantitative Variable

1.10 The Investigative Question Revisited and Data Collection

2.1 Tabular and Graphical Representations for the Distributions of Two Categorical Variables

2.2 Summary Statistics for Two Categorical Variables

2.11 The Normal Distribution

STAGE I Desired Results

STAGE I Desired Results	
Objective (Transfer)	
Students will be able to independently use their learning to… *Unit 1 introduces students to data and the vocabulary of statistics. Students also learn to talk about data in real-world contexts. Variability in data may seem to suggest certain conclusions about the data distribution, but not all variation is meaningful. Statistics allows us to develop shared understandings of uncertainty and variation. In this unit, students will define and represent categorical and quantitative variables, describe and compare distributions of one-variable data, and interpret statistical calculations to assess claims about individual data points or samples. Students will also begin to apply the normal distribution model as an introduction to how theoretical models for populations can be used to describe some distributions of sample data. Later units will more fully develop probabilistic modeling and inference.*	
Mastery	
Big Ideas/Understandings *Students will understand that…* **BIG IDEA 1: VARIATION AND DISTRIBUTION (VAR)** The distribution of measures for individuals within a sample or population describes variation. The value of a statistic varies from sample to sample. How can we determine whether differences between measures represent random variation or meaningful distinctions? Statistical methods based on probabilistic reasoning provide the basis for shared understandings about variation and about the likelihood that variation between and among measures, samples, and populations is random or meaningful. **BIG IDEA 2: PATTERNS AND UNCERTAINTY (UNC)** Statistical tools allow us to represent and describe patterns in data and to classify departures from patterns. Simulation and probabilistic reasoning allow us to anticipate patterns in data and to determine the likelihood	Essential Questions § Is my cat old, compared to other cats? § How certain are we that what seems to be a pattern is not just a coincidence?

of errors in inference.	
Acquisition	
Students will know . . . See “essential knowledge” in each topic of College Board CED for Unit 1	*Students will be skilled at . . .* Having access to a world of data is meaningless without the ability to organize and analyze that information. To develop these skills, students will need multiple opportunities to interact with data presented in different formats, i.e., as a table, a graph, or even just a list of values. Students should be asked to verbally describe the patterns and characteristics they see in the data (including shape, center, variability, and unusual features for a quantitative variable) and then compare the characteristics of two different sets of data. Students should also create displays that appropriately represent the data (e.g., using a bar graph for categorical data). Teachers can provide explicit feedback on students’ verbal responses so they understand the level of detail needed. For example, when students are asked to describe a distribution of quantitative data, they often provide an acronym associated with that type of distribution (e.g., SOCS or CUSS) but then struggle to discuss all the elements the acronym stands for. In particular, students often neglect to discuss unusual features such as gaps or outliers. Teachers can reinforce that these elements must be addressed in their descriptions and that all data has context (e.g., the variable of interest, including any units of

	measurement).

STAGE II Assessment Evidence

STAGE II Assessment Evidence	
Evaluation:	Assessments
Chapter evaluations in the format of AP exam (free responses and multiple choice based on chapter alignment of The Practice of Statistics Chapter 1: Data Analysis Chapter 2: Modeling Distributions of Data	Formative assessments will be based on FRQs from previous AP exams on topics at regular intervals in the chapter/unit.
Modifications	
How are the evaluations/assessments modified/accelerated? (i.e.: alternate assessment). All courses follow a balanced assessment system with Practice, Assessments, Evaluations.	

Modifications on 504 plans may be submitted at (SSD). prior to testing. Both exclusion statements and extensions exist for each standard to accommodate different paces.

STAGE III Learning Plan

STAGE III Learning Plan
Organize plan by weeks
Day 1: Lesson 1.1 - Categorical Data Day 2: Lesson 1.2 - Displaying Quantitative Data Day 3: Quiz 1.1-1.2 Day 4: Lesson 1.3 - Describing Quantitative Data Day 1 Day 5: Lesson 1.3 - Describing Quantitative Data Day 2

Day 6: Quiz 1.3
Day 7: Chapter 1 Review
Day 8: Chapter 1 Test
Day 9: Lesson 2.1 - Percentiles
Day 10: Lesson 2.1 - z-scores & Transforming Data
Day 11: Quiz 2.1
Day 12: Lesson 2.2 - Density Curves, 68-95-99.7 Rule
Day 13: Lesson 2.2 - Normal Distribution Calculations
Day 14: Lesson 2.2 - Assessing Normality
Day 15: Quiz 2.2
Day 16: Chapter 2 Review
Day 17: Chapter 2 Test

Modifications
How are the activities modified/differentiated? (i.e.: abridged text)

Modifications on 504 plans may be submitted at (SSD). prior to testing. Both exclusion statements and extensions exist for each standard to accommodate different paces.

Specific Resources for Unit

Specific Resources for Unit
Attached Affirmative Action Compliance Checklist

LP: AP Chapter 1 | StatsMedic
LP: AP Chapter 2 | StatsMedic
Analyzing categorical data | AP® Statistics | Math
Unit: Displaying and describing quantitative data
Summarizing quantitative data | AP® Statistics | Math
Modeling data distributions | AP® Statistics | Math
AP Classroom

Diversity, Equity, & Inclusion

Diversity, Equity &Inclusion
Provide a brief description of how this unit addresses DE&I.

Career Readiness (9.2), Life Literacies and Key Skills (9.4) Standards

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.2	Attend to financial well-being.
WRK.K-12.P.3	Consider the environmental, social and economic impacts of decisions.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.6	Model integrity, ethical leadership and effective management.
WRK.K-12.P.7	Plan education and career paths aligned to personal goals.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Climate Change Education

ClimateChange Education	
Enduring Understandings/Core Ideas	Performance Expectations
Math and ELA- Provide a brief description of a lesson or activity that relates to Climate Change. All other Content Team copy and paste the Core Idea and Performance Expectation from NJDOE link above.	