

Unit 5: Data Analysis and Statistics

Algebra 1

9 Class Meetings

Created July 2020; Revised May 2022

Essential Questions

- How can collecting and analyzing data help you make decisions or predictions?
- How can you make and interpret different representations of data?

Enduring Understandings with Unit Goals

EU 1: Statisticians use several methods to represent a set of one-variable data.

- Display a set of one-variable data in a frequency table and histogram
- Analyze a set of data by looking at a frequency table and histograms.

EU 2: Measures of center and spread can be used to understand a set of one-variable data.

- Calculate the mean, median, and mode of a set of data.
- Determine the quartiles, interquartile range, and outliers of a set of data to analyze the range of the data points.
- Create and analyze a boxplot from the measures of spread and center.

EU 3: Scatterplots are one way to compare and find relationships between two variables.

- Construct a scatterplot to represent a set of two-variable data.
- Analyze the trends that are displayed on a scatterplot.

Standards

Common Core State Standards:

- **HS.S.ID.A.1:** Represent data with plots on the real number line (dot plots, histograms, and box plots).
- **HS.S.ID.A.2:** Use statistics appropriate to the shape of the data distribution to compare the center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- **HS.S.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).
- **HS.S.ID.B.6:** Represent data on two quantitative variables on a scatterplot, and describe how the variables are related.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

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Unit Content Overview

1. Data Representation

- Using data to create frequency tables and histograms

2. Data Collection and Analysis

- Finding mean, median, mode, and range
- Finding outliers, IQR, Q1, and Q3
- Using statistics to create and analyze a boxplot

3. Scatterplots

- Compare two variables using a scatterplot
- Describe how the variables are related

Interdisciplinary Connection:

- Language Arts - Word Problems
- Marine Science – Word Problems

Daily Learning Objectives with *TWPS Activities*

Students will be able to...

- Create a Scatter Plot
 - *Do Now: Writing and Comparing Linear Equations.*
- Analyzing a Scatter Plot
 - *Do Now: Finding Mean, Median, and Mode from a data set*
- Using technology to analyze Scatter Plots
 - *Do Now: Writing and Comparing Linear Equations.*
- Measures of Central Tendency, Range, and Inter-Quartile Range
 - *Do Now: Finding the Equation of a Line from a Graph #1*
- Create a Box and Whisker Plot
 - *Do Now: Finding the Slope of a Line from a Graph #1*
- Create a histogram
 - *Do Now: Finding the y-intercept given a Scatter Plot*
- Analyzing a histogram
 - *Do Now: Finding the Slope of a Line from a Graph #2*

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Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Non-verbal Assessments
- Strategic Grouping

Assessments

FORMATIVE ASSESSMENTS:

- Accountable Talk Discussions
- Daily Think-Write-Pair Share (TWPS)
- Warm-Ups (SBAC prep)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction
- Homework

SUMMATIVE ASSESSMENTS:

- FIAB: Expressions and Equations II
- Performance Task (EU 1, EU 2, EU 3) - Height of Debate

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Unit Task

Unit Task Name: Height of Debate

Description: Students will use information learned in this unit about how to create and analyze frequency tables (EU 1), how to calculate and describe the measure of the center of a set of one variable data (EU 2), and how to represent a set of two-variable data on a scatterplot to compare the data points (EU 3) to analyze a set of data that they collect. Students will measure each other's height to compare with other body attributes such as the length of an arm, length of one foot, and length of the tip of the thumb to the tip of the index finger and use the data to find statistics about each variable independently as well as compare the variables and determine if there is a trend. Students will first create a separate histogram for height and wingspan and analyze the trend of the class. Students will then find the mean, median, mode, range, Q1, Q3, IQR, and outliers of each set of data separately to further analyze the trend of the class. They will also create a scatterplot of both variables to see if there is a linear relationship between the data. The students will write a well-developed reflection describing their findings and any trend that there may be within their class.

Evaluation: ISAAC Problem Solving Rubric

Unit Resources

- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Kahn Academy
- Match Fishtank
- Map.Mathshell.org
- Online resources