



## Unit 1: Statistics

Unit Length: 15 days

### Domain: Interpreting Categorical and Quantitative Data

- Cluster 25: Summarize, represent, and interpret data on a single count or measurement variable.
- Cluster 26: Make inferences and justify conclusions from sample surveys, experiments and observational studies.

### Domain: Making Inferences and Justifying Conclusions

- Cluster 27: Understand and evaluate random processes underlying statistical experiments.
- Cluster 28: Make inferences and justify conclusions from sample surveys, experiments and observational studies.

### Standards:

- HSS.ID.A.1 (From Algebra 1):
  - Represent data with plots on the real number line (**dot plots, histograms, and box plots**).
- HSS.ID.A.2 (From Algebra 1):
  - 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.
- \*HSS.ID.A.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 and/or spreadsheets to estimate areas under the normal curve.
  - Note: Limit area under the curve to the **empirical rule (68-95-99.7)** to estimate the percent of a normal population that falls within 1, 2, or 3 **standard deviations** of the **mean**. Also, recognize that **normal distributions** are only appropriate for **unimodal** and **symmetric shapes**.
- HSS.ID.B.5 (From Algebra 1):
  - 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.



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- \*HSS.ID.B.6:
  - Represent data on two **quantitative variables** on a **scatter plot**, and describe how the variables are related (**correlation**, if linear); fit a function to the data (**linear regression**); use functions fitted to data to solve problems in the context of the data.
- \*HSS.IC.A.1:
  - Recognize statistics as a process for making **inferences** about **population parameters** based on a **random sample** from that population.
- HSS.IC.A.2:
  - Compare **theoretical** and **empirical probabilities** using **simulations** (e.g. such as flipping a coin, rolling a number cube, spinning a spinner, and technology).
- HSS.IC.B.3:
  - Recognize the purposes of and differences among sample **surveys**, **experiments**, and **observational studies**; Explain how randomization relates to sample surveys, experiments, and observational studies.
- HSS.IC.B.6:
  - Read and explain, in context, the validity of data from outside reports by: identifying the variables as **quantitative** or **categorical**; describing how the data was collected; indicating any potential **biases** or flaws; identifying **inferences** the author of the report made from sample data.
  - Note: As a strategy, students could collect reports published in the media and ask students to consider the source of the data, the design of the study, and the way the data are analyzed and displayed.

*\*Guaranteed Viable Curriculum.*

Vocabulary to Emphasize is highlighted in **bold** script.



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First Week of School Warm up: Creating Graphs from a Verbal Description

First Week of School Warm up 2: Creating Graphs from a Verbal Description

Unit 1 Summative Assessment (Pre-AP Version)

Summative Assessment (Regular Version)

Learning Goal	Notes	Bellwork/Exit	Practice
<p><b>Students will recognize the purposes of and differences among sampling methods and be able to explain how randomization relates to each.</b></p> <p>Students will explore populations and samples and be able to explain the relationship between them.</p> <p>Recommend Two Days.</p>	<p>Sampling Note with Teaching Commentary.</p>	<p>Pre-Assessment Sampling with Key.</p> <p>CFA 1 Sampling with Key.</p>	<p>Random Rectangle Act. with Teaching Commentary.</p> <p>Worksheet with Key (Pre-AP).</p> <p>Worksheet with Key (Regular).</p>
<p><b>Students will recognize the purposes of and differences among sample surveys, experiments, and observational studies and be able to explain how randomization relates to each.</b></p> <p>Students will evaluate reports based on data and be able to explain their evaluation.</p> <p>Recommend Two Days.</p>	<p>Surveys, Experiments, Observational Study Note with Teaching Commentary.</p>		<p>Worksheet with Key (PAP).</p> <p>Worksheet with Key (Regular).</p> <p>Evaluating Reports Lesson with Teacher Commentary.</p> <p>Evaluating Reports Lesson Student Version Additional Resources for Evaluating Reports Lesson: Article: Bracing Patients</p> <p>Article: Pericarditis Study</p> <p>BMW Study link from Wall Street Journal (1:37 minutes long video) OR BMW Article.</p>



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Learning Goal	Notes	Bellwork/Exit	Practice
<p><b>Students will represent data dot plots, histograms, and boxplots and be able to describe differences in shape, center, and Spread.</b></p> <p>Be selective:) Boxplots and Histograms are recommended.</p>	<p>Displaying Data with Dotplots and Stem plot Note with Assignment.</p> <p>PowerPoint Displaying Data with Dot plot and Stem plot.</p> <p>Box plots and Histograms Note.</p> <p>PowerPoint Boxplots and Histograms.</p>	<p>Quiz: Interpreting Boxplots.</p>	<p>Box plot Worksheet.</p> <p>Histogram Worksheet.</p>
<p><b>Students will compute using technology and be able describe the correlation coefficient of a linear fit.</b></p> <p><b>Students will fit a function to data to make predictions and be able to compare two functions modeling the data.</b></p> <p>Recommend Three Days.</p>	<p>Note Linear Regression with Teaching Commentary.</p>	<p>Pre-assess Linear Regression with Key.</p> <p>CFA 2 Linear Regression with Key.</p>	<p>Balloon Size and Drop Height Activity.</p> <p>Shoe Size and Height Activity.</p> <p>Worksheet #1 with Key (PAP Version).</p> <p>Worksheet #2 with Key (Pre-AP Version).</p> <p>Worksheet with Key (Regular).</p> <p>Olympic Task.</p> <p>Laptop Battery Task.</p>



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<p><b>Students will use an experiment to simulate an event and be able to explain how the data generating model is used to compute probabilities.</b></p> <p><b>Students will summarize categorical data for two categories in two-way frequency tables and be able to interpret relative frequencies in the context of the data. (including joint, marginal, and conditional relative frequencies).</b></p> <p><b>Students will use the mean and standard deviation of a data set to find the area under the normal curve and be able to compare center and spread of data sets.</b></p>	<p>Intro: Empirical vs Theoretical Probability.</p> <p>PowerPoint Venn Diagram Intro.</p> <p>Answers for PowerPoint Venn Diagram Examples.</p> <p>Two-Way Table Probability Note.</p> <p>PowerPoint Two-Way Tables.</p> <p>PowerPoint Empirical Rule and Normal Distribution Intro.</p>	<p>Pre-Assessment for CFA 3 Standard Deviation and Normal Distribution.</p> <p>CFA 3 Standard Deviation and Normal Distribution with Key.</p> <p>CFA 3 Standard Deviation and Normal Distribution with Scoring Guide (Regular Version).</p>	<p>Worksheet (A): Empirical vs Theoretical Probability.</p> <p>Worksheet (B): Empirical vs Theoretical Probability.</p> <p>Worksheet (C): Empirical vs Theoretical Probability.</p> <p>Worksheet Venn Diagrams.</p> <p>Answers for Worksheet Venn Diagrams.</p> <p>Worksheet Tree Diagrams.</p> <p>Worksheet (A): Two-Way Tables.</p> <p>Worksheet (B): Two-Way Tables.</p> <p>Worksheet (C): Two-way Tables.</p> <p>Worksheet Probability Two-Way Tables.</p> <p>Conditional Probability Worksheet.</p> <p>Worksheet Empirical Rule.</p> <p>Tasks 1-14: Empirical Rule.</p>