Unit Eleven: Descriptive Statistics

Content Area: **Mathematics**
Course(s): **Algebra 8**
Time Period: **May**
Length: **2 weeks**
Status: **Published**

Transfer

Big Idea: Descriptive Statistics

Enduring Understandings

Sets of numerical data are described using measures of central tendency and dispersion.

The way that data is collected, organized and displayed influences interpretation

Essential Questions

How can collecting and analyzing data help you make decisions or predictions?

How can you make and interpret different representations of data?

How do people use data to influence others?

Critical Knowledge and Skills

Vocabulary

Box-and-Whisker Plot, Causation, Correlation, Correlation Coefficient, Dispersion, Dot Plot, Extrapolation, Frequency, Frequency Table, Histogram, Interpolation, Interquartile Range, Line of Best Fit, Mean, Measures of Central Tendency, Median, Mode outcome, Outlier, Population Percentage, Quartiles, Range of a Data Set, Residual, Scatter Plot, Standard Deviation, Trend Line

Learning Objectives

Investigate patterns of bivariate data (8.SP.1,2,3,4)

Represent data with plots on the real number line (dot plots, histograms, and box plots (S.ID.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 (S.ID.2)

Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers) (S.ID.3)

Summarize categorical data for two categories in two-way frequency tables (S.ID.5)

Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies) (S.ID.5)

Recognize possible associations and trends in data (S.ID.5)

Resources

Khan Academy: HIgh School Statistics

NCTM Illuminations: NBA Statistics for Box-and-Whisker Plots

NCTM Illuminations: Will the Best Candidate Win?

3 Act Math: Pumpkin Time-Bomb Activity

Standards

RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP11. Use technology to enhance productivity.

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions

affect income.

9.1.8.C.5 Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages).

9.1.8.D.3 Differentiate among various investment options.

9.1.8.E.6 Compare the value of goods or services from different sellers when purchasing large quantities and small quantities.

9.2.8.B.7 Evaluate the impact of online activities and social media on employer decisions.

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.

8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.

MA.S-ID.A	Summarize, represent, and interpret data on a single count or measurement variable
MA.S-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
MA.S-ID.A.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.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.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).
MA.K-12.4	Model with mathematics.
MA.S-ID.B	Summarize, represent, and interpret data on two categorical and quantitative variables
MA.S-ID.B.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.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.S-CP.A	Understand independence and conditional probability and use them to interpret data
MA.S-CP.A.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”).
MA.S-CP.A.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
MA.S-CP.A.3	Understand the conditional probability of A given B as $P(A\ and\ B)/P(B)$, 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.
MA.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.