# Unit 11: Descriptive Statistics

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

## Transfer

**Big Idea: Descriptive Statistics**

## 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?

## 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

## Standards in Mathematics

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| 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). |

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| 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. |

## 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