



Algebra 1 Unit 1 (HS): One-Variable Statistics

Unit Focus

The unit begins with an opportunity for students to review ideas from previous courses while taking the analysis of the data displays a little deeper. The lessons build on student understanding gained in middle school grades of statistical variability, ability to describe distributions, and informally comparing distributions. They represent and interpret data using data displays such as dot plots, histograms, and box plots. They describe distributions using the appropriate terminology such as “symmetric,” “skewed,” “uniform,” “bimodal,” and “bell-shaped.” They create data displays and calculate summary statistics using technology, then interpret the values in context. They recognize a relationship between the shape of a distribution and the mean and median. They compare data sets with different measures of variability and interpret data sets with greater interquartile ranges as having greater variability.

Students explore outliers and compare data sets using measures of center and measures of variability. They recognize outliers, investigate their source, make decisions about excluding them from the data set, and understand how the presence of outliers impacts measures of center and measures of variability.

Lastly, students get a chance to practice their skills by collecting data and analyzing the values. In the culminating activity, students pose and answer a statistical question by designing an experiment, collecting data, and analyzing data.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 9-12 - Represent data with plots on the real number line (dot plots, histograms, and box plots). (CCSS.MATH.CONTENT.HSS.ID.A.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. (CCSS.MATH.CONTENT.HSS.ID.A.2) - Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS.MATH.CONTENT.HSS.ID.A.3) - Model with mathematics. (CCSS.MATH.MP.4) Madison Public Schools Profile of a Graduate - Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2)	<i>Students will be able to independently use their learning to...</i> T1 Apply models to solve problems.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Mathematicians create or use models to generalize, represent, and solve problems.	<i>Students will keep considering...</i> Q1 What model best represents this problem?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 Vocabulary: bell-shaped distribution, bimodal distribution, categorical data, distribution, five-number summary, non-statistical question, numerical data, outlier, skewed distribution, standard deviation, statistic,	<i>Students will be skilled at...</i> S1 Finding the five-number summary for data. S2 Representing data using a dot plot, histogram, or box plot.

Stage 1: Desired Results - Key Understandings

statistical question, symmetric distribution, uniform distribution

K2 The difference between statistical and non-statistical questions.

K3 The difference between numerical data and categorical data.

K4 How an extreme value will affect the mean and median.

S3 Describing the shape of a distribution using the terms "symmetric, skewed, uniform, bimodal, and bell-shaped."

S4 Calculating interquartile range, mean, and median for a set of data.

S5 Using the shape of a distribution to compare the mean and median.

S6 Finding values that are outliers and tell how an outlier will impact mean, median, or IQR.