



Standard #: MAFS.912.S-ID.1.3

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

Grade: 912	
Cluster: Summarize, represent, and interpret data on a single count or measurement variable. (Algebra 1 - Additional Cluster) (Algebra 2 - Additional Cluster) - Clusters should not be sorted from Major to Supporting and then taught in that order. To do so would strip the coherence of the mathematical ideas and miss the opportunity to enhance the major work of the grade with the supporting clusters.	Date Adopted or Revised: 02/14
Content Complexity Rating: Level 2: Basic Application of Skills & Concepts - More Information	Date of Last Rating: 02/14
Status: State Board Approved	Assessed: Yes

Remarks/Examples

In grades 6 – 8, students describe center and spread in a data distribution. Here they choose a summary statistic appropriate to the characteristics of the data distribution, such as the shape of the distribution or the existence of extreme data points.

TEST ITEM SPECIFICATIONS

Assessed with:
MAFS.912.S-ID.1.2

Related Courses

Course Number	Course Title
1200310:	Algebra 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200320:	Algebra 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200380:	Algebra 1-B (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200400:	Intensive Mathematics (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1210300:	Probability & Statistics with Applications Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000350:	Anatomy and Physiology (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000360:	Anatomy and Physiology Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2020910:	Astronomy Solar/Galactic Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000320:	Biology 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000330:	Biology 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
2003340:	Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003350:	Chemistry 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003360:	Chemistry 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2001320:	Earth/Space Science Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2001340:	Environmental Science (Specifically in versions: 2015 and beyond (current))
2000440:	Genetics (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002410:	Integrated Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002430:	Integrated Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002440:	Integrated Science 3 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002450:	Integrated Science 3 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002500:	Marine Science 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002510:	Marine Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002520:	Marine Science 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002530:	Marine Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003400:	Nuclear Radiation (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))

2020710:	Nuclear Radiation Honors (formerly 202071A) (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003320:	Physical Science Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003380:	Physics 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003390:	Physics 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003410:	Physics 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002540:	Solar Energy Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2107310:	Psychology 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7912070:	Access Liberal Arts Mathematics (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
7912090:	Access Algebra 1B (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
7920011:	Access Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
2000500:	Bioscience 1 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000510:	Bioscience 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2002445:	Integrated Science 3 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2003345:	Chemistry 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2003385:	Physics 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
1200315:	Algebra 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200385:	Algebra 1-B for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1207300:	Liberal Arts Mathematics 1 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2100335:	African-American History (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7912075:	Access Algebra 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))
2106410:	Humane Letters 1 - History (Specifically in versions: 2019 and beyond (current))

Related Access Points

Access Point

Access Points Number	Access Points Title
MAFS.912.S-ID.1.AP.3a:	Use statistical vocabulary to describe the difference in shape, spread, outliers and the center (mean).

Related Resources

Lesson Plan

Name	Description
Bubble Gum Bubbles Lab:	This lesson is a Follow Up Activity to the Algebra Institute and allows students to collect data by blowing bubble gum bubbles and perform statistical analysis, including standard deviation. This lesson provides students an applied setting to use their previously acquired statistical skills.
Centers, Spreads, and Outliers:	The students will compare the center and spread of data sets as well as find the effects of outliers.
Digging the Plots:	Students are asked to construct given data in a data plot to analyze and determine if the data is symmetric, skewed, or uniform with an appropriate explanation. Students will give a visual display of interpreted results.
Florida's Manatee Population:	Students will use box plots to identify data on the past and present manatee populations on both coasts of Florida during the winter months, January through March. This lesson is designed to use technology to create box plots and analyze data. As an alternate lesson without technology, the manatee data in this lesson can be used to create box plots with graph paper and pencils. Students will use data about the past and current manatee populations in Florida and display and analyze the data using Excel and Geogebra.
	This lesson is intended to be an enrichment experience and should be used after students have mastered box plots as described in the standard MAFS.912.S-ID.1.1.
Grapevine Fabrication Part 1:	This lesson is a Follow Up Activity to the Algebra Institute and allows students to collect data to perform basic statistical operations to analyze and make comparisons on variability within a certain brand of raisins. Part 1 may be completed without Part 2. This investigation can elicit discussion about manufacturing and quality control.
Grapevine Fabrication Part 2:	This lesson is a Follow Up Activity to the Algebra Institute and allows students to collect data to perform basic statistical operations to analyze and make comparisons on variability within a certain brand of raisins. Part 1 must be completed prior to starting Part 2. This investigation can elicit discussion about manufacturing and quality control.
Hot Coffee Coming Through:	In this lesson, students will explore data collection using the temperature probe sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation to determine which coffee mug is the best. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a problem based STEM challenge. Due to the multiple skills there are many standards that are covered.
	There are two options for this lab. The first student handout is for students at an average high school statistics level (Algebra 1) and will allow for standard deviation and graphical analyses of the data. The second option is for advanced students that have been exposed to hypothesis testing of claims (Algebra 2 or AP Stats).
House Hunting!:	Students will use criteria such as median home price, neighborhood safety, and likelihood of evacuation during a hurricane to rank a list of neighborhoods in which to shop for a home.
	This lesson allows for students to have a hands on experience collecting real-world data, creating graphical

Marshmallow Madness:	representations, and analyzing their own data. Students will make predictions as to the outcome of the data and compare their predictions to the actual outcome.
Outliers in the Outfield – Dealing With Extreme Data Points:	Students will explore the effects outliers have on mean and median values using MLB salaries stats.
Representing Data 1: Using Frequency Graphs:	This lesson unit is intended to help you assess how well students are able to use frequency graphs to identify a range of measures, make sense of this data in a real-world context, and understand that a large number of data points allow a frequency graph to be approximated by a continuous distribution.
Representing Data 2: Using Box Plots:	This lesson unit is intended to help you assess how well students are able to interpret data using frequency graphs and box plots. In particular, this unit aims to identify and help students who have difficulty figuring out the data points and spread of data from frequency graphs and box plots. It is advisable to use the first lesson in the unit, Representing Data 1: Frequency Graphs (32498), before this one.
Sea Ice Analysis:	The changing climate is an important topic for both scientific analysis and worldly knowledge. This lesson uses data collected by the National Snow and Ice Data Center to create and use statistical analysis as a tool to evaluate the sea ice loss. Students will use technology to quickly generate graphs for each month looking for trends, patterns or deviations over time.
Sea Ice Analysis Algebra:	The changing climate is an important topic for both scientific analysis and worldly knowledge. This lesson uses data collected by the National Snow and Ice Data Center to create and use statistical analysis as a tool to evaluate the sea ice loss. Students will use technology to quickly generate graphs for each month looking for trends, patterns, or deviations over time.
Sensing Data:	In this follow up lesson, students will explore data collection using the weather station sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation of their own. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a personally meaningful way.
Sensing Data:	In this follow up lesson, students will explore data collection using the weather station sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation of their own. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a personally meaningful way.
Should Statistics be Shapely?:	This resource is a lesson plan developed for students to master MAFS.912.S.1.3 (Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points). Students will create a Human Box Plot using their own personal data to master the standard and learning objectives, then complete interactive notes with classroom teacher, a formative assessment, and later a summative assessment to show mastery.
The Distance a Coin Will Travel:	This lesson is a hands on activity that will allow students to collect and display data about how far different coins will travel. The data collected is then used to construct double dot plots and double box plots. This activity helps to facilitate the statistical implications of data collection and the application of central tendency and variability in data collection.
What's My Grade?:	"What's My Grade" is a lesson that will focus on a sample student's grades to demonstrate how a final grade is calculated as well as explore possible future grades. Students will create the distributions of each of grade category using histograms. They will also analyze grades using mean and standard deviation. Students will use statistics to determine data distribution while comparing center and spread of two or more different data sets.
Which is Better? Using Data to Make Choices:	This lesson gives students the opportunity to use technology to investigate variability in data. Students will draw conclusions and cite evidence from the data to support their conclusions.

Formative Assessment

Name	Description
Comparing Distributions:	Students are given two histograms and are asked to describe the differences in shape, center, and spread.
Total Points Scored:	Students are given a set of data and are asked to determine how the mean is affected when an outlier is removed.
Using Centers to Compare Tree Heights:	Students are asked to compare the centers of two data distributions displayed using box plots.
Using Spread to Compare Tree Heights:	Students are asked to compare the spread of two data distributions displayed using box plots.

Problem-Solving Task

Name	Description
Haircut Costs:	This problem could be used as an introductory lesson to introduce group comparisons and to engage students in a question they may find amusing and interesting.
Speed Trap:	The purpose of this task is to allow students to demonstrate an ability to construct boxplots and to use boxplots as the basis for comparing distributions.

Virtual Manipulative

Name	Description
Histogram Tool:	This virtual manipulative histogram tool can aid in analyzing the distribution of a dataset. It has 6 preset datasets and a function to add your own data for analysis.
	With this online tool, students adjust the standard deviation and sample size of a normal distribution to see how it will

[Normal Distribution Interactive Activity:](#) affect a histogram of that distribution. This activity allows students to explore the effect of changing the sample size in an experiment and the effect of changing the standard deviation of a normal distribution. Tabs at the top of the page provide access to supplemental materials, including background information about the topics covered, a description of how to use the application, and exploration questions for use with the java applet.

Lesson Study Resource Kit

Name	Description
Measurement Matters:	This Lesson Study Resource Kit is an introductory unit on measurement for a Chemistry I course.

Perspectives Video: Professional/Enthusiast

Name	Description
Nestle Waters & Statistical Analysis:	Hydrogeologist from Nestle Waters discusses the importance of statistical tests in monitoring sustainability and in maintaining consistent water quality in bottled water.
Sampling Amphibian Populations to Study Human Impact on Wetlands:	Ecologist Rebecca Means discusses the use of statistical sampling and comparative studies in field biology.
Statistical Art: Four Words:	Graphic designer and artist, Drexston Redway infuses statistics into his artwork to show population distribution and overlap of poverty and ethnicity in Tallahassee, FL.

Unit/Lesson Sequence

Name	Description
	<p>This sample Algebra 1 CMAP is a fully customizable resource and curriculum-planning tool that provides a framework for the Algebra 1 Course. The units and standards are customizable and the CMAP allows instructors to add lessons, worksheets, and other resources as needed. This CMAP also includes rows that automatically filter and display Math Formative Assessments System tasks, E-Learning Original Student Tutorials and Perspectives Videos that are aligned to the standards, available on CPALMS.</p> <p>Learn more about the sample Algebra 1 CMAP, its features and customizability by watching the following video:</p> <p>Sample Algebra 1 Curriculum Plan Using CMAP:</p> <p>Using this CMAP</p> <p>To view an introduction on the CMAP tool, please click here.</p> <p>To view the CMAP, click on the "Open Resource Page" button above; be sure you are logged in to your iCPALMS account.</p> <p>To use this CMAP, click on the "Clone" button once the CMAP opens in the "Open Resource Page." Once the CMAP is cloned, you will be able to see it as a class inside your iCPALMS My Planner (CMAPs) app.</p> <p>To access your My Planner App and the cloned CMAP, click on the iCPALMS tab in the top menu.</p> <p>All CMAP tutorials can be found within the iCPALMS Planner App or at the following URL: http://www.cpalms.org/support/tutorials_and_informational_videos.aspx</p>

Text Resource

Name	Description
Scientists See the World Differently:	This informational text resource is intended to support reading in the content area. Pew Research Center surveyed scientists and the general public on 12 science oriented issues, including genetically modified foods, vaccines, nuclear power and evolution. Results of the survey showed large discrepancies between the thoughts, causes and recommendations on the issues of the scientists and the general public. Sample sizes and margins of errors are given on the survey results which are represented in percent form. The overall survey showed that the public and the scientists see the world very differently.

Teaching Idea

Name	Description
	This lesson is designed to introduce students to stem-and-leaf plots as a graphical way to represent a data set. The

[Stem-and-Leaf Plots:](#)

lesson also reviews measures of central tendency with directions for finding mean, median, and mode are given. This lesson provides links to discussions and activities related to stem-and-leaf plots as well as suggested ways to integrate them into the lesson. Finally, the lesson provides links to follow-up lessons designed for use in succession with the current one.

Student Resources

Name	Description
Haircut Costs:	This problem could be used as an introductory lesson to introduce group comparisons and to engage students in a question they may find amusing and interesting.
Histogram Tool:	This virtual manipulative histogram tool can aid in analyzing the distribution of a dataset. It has 6 preset datasets and a function to add your own data for analysis.
Normal Distribution Interactive Activity:	With this online tool, students adjust the standard deviation and sample size of a normal distribution to see how it will affect a histogram of that distribution. This activity allows students to explore the effect of changing the sample size in an experiment and the effect of changing the standard deviation of a normal distribution. Tabs at the top of the page provide access to supplemental materials, including background information about the topics covered, a description of how to use the application, and exploration questions for use with the java applet.
Speed Trap:	The purpose of this task is to allow students to demonstrate an ability to construct boxplots and to use boxplots as the basis for comparing distributions.

Parent Resources

Name	Description
Haircut Costs:	This problem could be used as an introductory lesson to introduce group comparisons and to engage students in a question they may find amusing and interesting.
Speed Trap:	The purpose of this task is to allow students to demonstrate an ability to construct boxplots and to use boxplots as the basis for comparing distributions.