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| **Grade Level** 9TH | | **Teacher/Room**: Lisa Payne/181 Week of: 11/16-11/20  Algebra I | | | |
| **Unit Vocabulary: SEE ATTACHED LIST** | | | | | |
| **Instructional Strategies Used:** direct instruction, independent study, interactive instruction, partners task, algebra lab, ticket out the door, algebra tech lab, thumbs up/down | | | | | |
| **Day 1** | **Day 2** | | **Day 3** | **Day 4** | **Day 5** |
| **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  MGSE9-12.F.IF.6,7,8  MGSE9-12.S.ID.1,2,3  **SMP- 1,2,4** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.S.ID.1,2,3,5  **SMP- 3,4,6** | | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.S.ID.1,2,3,5  **SMP- 3,4,6** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.S.ID.1,2,3,5  **SMP- 2,3,4,6,7** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.S.ID.1,2,3,5  **SMP- 2,3,4,6,7** |
| **EQ Question:**  Can I graph, solve, write models of quadratic equations?  How can I use visual representations and measures of center and spread to compare two data sets? | **EQ Question:**  HOW CAN I STUDY FOR THE MILESTONE?  HOW CAN I WRITE A LEAST SQUARE REGRESSION LINE? | | **EQ Question:**  How can I use visual representations and measures of center and spread to compare two data sets?  What do frequency graphs tell me about the center and spread of data?  Can I write a line of best fit? | **EQ Question:**  How can I use visual representations and measures of center and spread to compare two data sets?  What do box plots tell me about the center and spread of data?  How are box plots and frequency graphs related? | **EQ Question:**  How can I use visual representations and measures of center and spread to compare two data sets?  How do you interpret relative frequencies in the context of a two-way frequency table? |
| **Mini Lesson:**  Usatestprep- lab  **Activating Strategies: SQR3**  **Lesson:**  TEST QUADRATIC FORMULA  EOC REVIEW TASK  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  EOC REVIEW  **Activating Strategies:SQR3**  **Lesson:**  Least square regression line  EOC REVIEW  **Resource/Materials:**  Books, calculator, review WS, task | | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson:**  MAD  SHAPE, CENTER, SPREAD  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson:**  Box plots  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson: Review**  Two-way Frequency tables  **Resource/Materials:**  Books, calculator, review WS, task |
| **Differentiation:**  *content – usatestprep TOD -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content – usatestprep TOD -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | | **Differentiation:**  *content - level of difficulty content -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content – Centers-*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content - level of difficulty content -*  *Grouping Strategy (if any): Grouping*  *teacher selected* |
| **Assessment :**  Formative: Warm up, Survey, or homework  Summative: | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: Chapter 8 Vocabulary Quiz | | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: Factoring test | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: |
| **Homework:**  EOC REVIEW | **Homework:**  EOC REVIEW  LEAST SQUARE REGRESSION LINE | | **Homework:**  The Basketball Star Task  Formative Assessment Lesson: Representing data 1: Using Frequency Graphs | **Homework:**  Formative Assessment Lesson: Representing Data 2: Using Box Plots | **Homework:**  Public Opinions and Leisure Time (Spotlight task)  12.7 Two-way Frequency tables  Pg. 801, 1-13 |

Resources and Reflective Notes: Tuesday Factoring review Thursday Collecting data centers. Grouping based on the usatestprep assignments.

**Interpreting Categorical and Quantitative Data**

**Summarize, represent, and interpret data on a single count or measurement variable.**

**MGSE9-12.S.ID.1** Represent data with plots on the real number line (dot plots, histograms, and box plots). Choose appropriate graphs to be consistent with numerical data: dot plots, histograms, and box plots.

**MGSE9-12.S.ID.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, mean absolute deviation, standard deviation) of two or more different data sets.**

**MGSE9-12.S.ID.3** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). Students will examine graphical representations to determine if data are symmetric, skewed left, or skewed right and how the shape of the data affects descriptive statistics.

**Summarize, represent, and interpret data on two categorical and quantitative variables.**

**MGSE9-12.S.ID.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.

**MGSE9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

**MGSE9-12.S.ID.6a Decide which type of function is most appropriate by observing graphed data, charted data, or by analysis of context to generate a viable (rough) function to best fit. Use this function to solve problems in context. Emphasize linear, quadratic, and exponential models.**

**MGSE9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.**

**Interpret linear models**

**MGSE9-12.S.ID.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

**MGSE9-12.S.ID.8 Compute (using technology) and interpret the correlation coefficient “r” of a linear fit. (For instance, by looking at a scatterplot, students should be able to tell if the correlation coefficient is positive or negative and give a reasonable estimate of the “r” value.) After calculating the line of best fit using technology, students should be able to describe how strong the goodness of fit of the regression is, using “r.”**

**MGSE9-12.S.ID.9** Distinguish between correlation and causation.

**STANDARDS FOR MATHEMATICAL PRACTICE**

Refer to the Comprehensive Course Overview for more detailed information about the Standards for Mathematical Practice.

**1.** Make sense of problems and persevere in solving them.

**2.** Reason abstractly and quantitatively.

**3.** Construct viable arguments and critique the reasoning of others.

**4.** Model with mathematics.

**5.** Use appropriate tools strategically.

**6.** Attend to precision.

**7.** Look for and make use of structure.

**8.** Look for and express regularity in repeated reasoning.

**ESSENTIAL QUESTIONS**

• How do I summarize, represent, and interpret data on a single count or measurement variable?

• When making decisions or comparisons, what factors are important for me to consider in determining which statistics to compare, which graphical representation to use, and how to interpret the data?

• How can I use visual representations and measures of center and spread to compare two data sets?

• How do I summarize, represent, and interpret data on two categorical and quantitative variables?

• How do I interpret relative frequencies in the context of a two-way frequency table?

• Why is technology valuable when making statistical models?

• How do you determine the regression line or line of best fit for a scatter plot of data?

• Why are linear models used to study many important real-world phenomena?

• How do I interpret linear models?

• How do I determine if linear or exponential regression is more appropriate for a scatter plot?

• How can I apply what I have learned about statistics to summarize and analyze real data?

**Association.** A connection between data values.

• **Bivariate data.** Pairs of linked numerical observations. Example: a list of heights and weights for each player on a football team.

• **Box Plot.** A method of visually displaying a distribution of data values by using the median, quartiles, and extremes of the data set. A box shows the middle 50% of the data.

• **Box-and-Whisker Plot.** A diagram that shows the five-number summary of a distribution. (Five-number summary includes the minimum, lower quartile (25th percentile), median (50th percentile), upper quartile (75th percentile), and the maximum. In a modified box plot, the presence of outliers can also be illustrated.

• **Categorical Variables.** Categorical variables take on values that are names or labels. The color of a ball (e.g., red, green, blue), gender (male or female), year in school (freshmen, sophomore, junior, senior). These are data that cannot be averaged or represented by a scatter plot as they have no numerical meaning.

• **Center.** Measures of center refer to the summary measures used to describe the most “typical” value in a set of data. The two most common measures of center are median and the mean.

• **Conditional Frequencies.** The relative frequencies in the body of a two-way frequency table.

• **Correlation Coefficient.** A measure of the strength of the linear relationship between two variables that is defined in terms of the (sample) covariance of the variables divided by their (sample) standard deviations.

• **Dot plot.** A method of visually displaying a distribution of data values where each data value is shown as a dot or mark above a number line.

**Georgia Department of Education** Georgia Standards of Excellence Framework *Accelerated GSE Algebra I/Geometry A* • *Unit 6* Mathematics Accelerated GSE Algebra I/Geometry A Unit 6: Describing Data Richard Woods, State School Superintendent July 2015 Page 9 of 106 All Rights Reserved

• **First Quartile (Q1).** The “middle value” in the *lower* half of the rank-ordered data

• **Five-Number Summary.** Minimum, lower quartile, median, upper quartile, maximum.

• **Histogram-** Graphical display that subdivides the data into class intervals and uses a rectangle to show the frequency of observations in those intervals—for example you might do intervals of 0-3, 4-7, 8-11, and 12-15

• **Interquartile Range.** A measure of variation in a set of numerical data. The interquartile range is the distance between the first and third quartiles of the data set. Example: For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the interquartile range is 15 – 6 = 9.

• **Joint Frequencies.** Entries in the body of a two-way frequency table.

• **Line of Best Fit (**trend or regression line). A straight line that best represents the data on a scatter plot. This line may pass through some of the points, none of the points, or all of the points. Remind students that an exponential model will produce a curved fit.

• **Marginal Frequencies.** Entries in the "Total" row and "Total" column of a two-way frequency table.

• **Mean Absolute Deviation.** A measure of variation in a set of numerical data, computed by adding the distances between each data value and the mean, then dividing by the number of data values. Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the mean absolute deviation is 20.

• **Outlier.** Sometimes, distributions are characterized by extreme values that differ greatly from the other observations. These extreme values are called outliers. As a rule, an extreme value is considered to be an outlier if it is at least 1.5 interquartile ranges below the lower quartile (Q1), or at least 1.5 interquartile ranges above the upper quartile (Q3).

**OUTLIER if the values lie outside these specific ranges:**

Q1 – 1.5 • IQR

Q3 + 1.5 • IQR

• **Quantitative Variables.** Numerical variables that represent a measurable quantity. For example, when we speak of the population of a city, we are talking about the number of people in the city – a measurable attribute of the city. Therefore, population would be a quantitative variable. Other examples: scores on a set of tests, height and weight, temperature at the top of each hour.

• **Scatter plot.** A graph in the coordinate plane representing a set of bivariate data. For example, the heights and weights of a group of people could be displayed on a scatter plot. If you are looking for values that fall within the range of values plotted on the scatter plot,

you are interpolating. If you are looking for values that fall beyond the range of those values plotted on the scatter plot, you are extrapolating.

• **Second Quartile (**Q2**).** The *median* value in the data set.

• **Shape**. The shape of a distribution is described by symmetry, number of peaks, direction of skew, or uniformity.

• **Symmetry**- A symmetric distribution can be divided at the center so that each half is a mirror image of the other.

• **Number of Peaks**- Distributions can have few or many peaks. Distributions with one clear peak are called unimodal and distributions with two clear peaks are called bimodal. Unimodal distributions are sometimes called bell-shaped.

* **Direction of Skew**- Some distributions have many more observations on one side of graph than the other. Distributions with a tail on the right toward the higher values are said to be skewed right; and distributions with a tail on the left toward the lower values are said to be skewed left.

• **Uniformity-** When observations in a set of data are equally spread across the range of the distribution, the distribution is called uniform distribution. A uniform distribution has no clear peaks.

• **Spread.** The spread of a distribution refers to the variability of the data. If the data cluster around a single central value, the spread is smaller. The further the observations fall from the center, the greater the spread or variability of the set. (range, interquartile range, Mean Absolute Deviation, and Standard Deviation measure the spread of data)

• **Third quartile.** For a data set with median *M*, the third quartile is the median of the data values greater than ***M***. Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the third quartile is 15.

• **Trend.** A change (positive, negative or constant) in data values over time.

• **Two-Frequency Table.** A useful tool for examining relationships between categorical variables. The entries in the cells of a two-way table can be frequency counts or relative frequencies.

**Notes: Comparing Distributions**

When you compare two or more data sets, focus on four features:

**Center.** Graphically, the center of a distribution is the point where about half of the observations are on either side.

**Spread**. The spread of a distribution refers to the variability of the data. If the observations cover a wide range, the spread is larger. If the observations are clustered around a single value, the spread is smaller.

**Shape**. The shape of a distribution is described by symmetry, skewness, number of peaks, etc.

**Unusual features**. Unusual features refer to gaps (areas of the distribution where there are no observations) and outliers.