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| **Grade Level:** **LESSON PLANS ARE SUBJECT TO CHANGE DAILY!** | 9th | **Teacher/Room**: | LPayne | / | 181 | **Course(s)/ Period(s):**  | Acc. Coordinate Alg | / | 3/ 4  | **Week of:** | 9/1-9/5 |
| **Unit Vocabulary:**  | Unit 4- see attached |
| **Instructional Strategies Used:**  | **Lecture, whole-group, individual, PowerPoint, Computer Lab, Video Clips, gadoe task,Cornell Note-taking system** |
| **Monday**  | **Tuesday** | **Wednesday** | **Thursday** | **Friday**  |
| **Common Core Standard(s)**: | **Common Core GPS:** **MCC 9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **MCC 9-12.NQ.**1 … choose and interpret the scale and the origin in graphs and data displays. | **Common Core Standard(s)**: **MCC 9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. b. Informally assess the fit of a function by plotting and analyzing residuals. **MCC 9-12.S.ID.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. **MCC 9-12.S.ID.8** Compute (using technology) and interpret the correlation coefficient of a linear fit. **MCC 9-12.S.ID.9** Distinguish between correlation and causation. | **Common Core Standard(s)**: **MCC 9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. b. Informally assess the fit of a function by plotting and analyzing residuals. **MCC 9-12.S.ID.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. **MCC 9-12.S.ID.8** Compute (using technology) and interpret the correlation coefficient of a linear fit. **MCC 9-12.S.ID.9** Distinguish between correlation and causation. | **Common Core Standard(s)**: **MCC 9-12.S.ID.6** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. b. Informally assess the fit of a function by plotting and analyzing residuals. **MCC 9-12.S.ID.7** Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. **MCC 9-12.S.ID.8** Compute (using technology) and interpret the correlation coefficient of a linear fit. **MCC 9-12.S.ID.9** Distinguish between correlation and causation. |
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| **Essential Question:** | **Essential Question:** **How can you represent data on a scatter plot** **and use trend lines to make predictions?** | **Essential Question:** **How can you use residuals and linear regression to determine the line of best fit?** | **Essential Question:** **How can you use residuals and linear regression to determine the line of best fit?** | **Essential Question: How can you use residuals and linear regression to determine the line of best fit?** |
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| **Mini Lesson:**  | **Mini Lesson: Give back quizzes and answer questions** | **Mini Lesson:**  | **Mini Lesson: 15.1 Technology task** | **Mini Lesson: Review**  |
| * **Labor Day**
 |  |  |  | **Unit 5 transformations introduction.**  |
| **Activating Strategies:**  | **Activating Strategies: What does a scatter plot look like** **if there is no correlation between** **the data sets? positive correlation?** **negative correlation?** | **Activating Strategies: How do you decide where to draw the trend line?** | **Activating Strategies: When viewing the values of a and b in the equation of the trend line y = ax + b, point out that** **0.5079441502x - 26.78767453 =****0.5079441502x + (-26.78767453) .** | **Activating Strategies:**  |
|  |  |  |  |  |
| **Lesson:**  | **Lesson:**  | **Lesson:**  | **Lesson: TV / Test Grades (Learning Task)** | **Lesson: TEST** |
| **Resource/Materials:** | **Resource/Materials: Textbook, graphing calculator, graph paper, ruler** | **Resource/Materials: Textbook, graphing calculator, graph paper, ruler** | **Resource/Materials: Textbook, graphing calculator, graph paper, task TV / Test Grades (Learning Task)** | **Resource/Materials: Test, graphing calculator.**  |
|  |  |  |  |  |
| **Differentiation:*****Content/Process/Product:***  | **Differentiation:*****Content/Process/Product:* Extension:****• Name another pair of variables that are likely to have a negative correlation without a reason to expect causation.****• Find real-life examples of situations where people prove correlation and expect you to believe there is causation. (Look at advertisements, political speeches, etc.)** | **Differentiation:*****Content/Process/Product:* Extension:****• Name another pair of variables that are likely to have a negative correlation without a reason to expect causation.****• Find real-life examples of situations where people prove correlation and expect you to believe there is causation. (Look at advertisements, political speeches, etc.)** | **Differentiation:*****Content/Process/Product:*** ***Intervention:******• Students may want to actually graph some (or all) of the data points in #2 to decide*** ***which pairs of variables have positive/negative/no correlation. Be sure to push students*** ***to go back to the table to see how they could have made these predictions numerically*** ***without taking the time to graph points to make the prediction graphically.***  | **Differentiation:*****Content/Process/Product:***  |
|  | * Graphic Organizers
 | * Graphic Organizers
 | * NA
 | * NA
 |
| ***Grouping Strategy (if any):*** | ***Grouping Strategy (if any):*** | ***Grouping Strategy (if any):*** | ***Grouping Strategy (if any):*** | ***Grouping Strategy (if any):*** |
|  | * Flexible Grouping
 | * Flexible Grouping
 | * Flexible grouping
 | * NA
 |
| ***Assessment Strategy:*** | ***Assessment Strategy:*** | ***Assessment Strategy:*** | ***Assessment Strategy:*** | ***Assessment Strategy:*** |
|  | * Grouping based on formative assessment
 | * Grouping based on formative assessment
 | * NA
 | * NA
 |
| **Assessment :** | **Assessment :** | **Assessment :** | **Assessment :** | **Assessment :** |
| ***Formative:***  |  | ***Formative:***  | Thumbs Up/Down | ***Formative:*** | Ticket out the door | ***Formative:*** | ***Task***  | ***Formative:*** | NA |
| ***Summative:***  | NA | ***Summative:***  | NA | ***Summative:*** | Check homework | ***Summative:*** | Check homework | ***Summative:*** | ***Test***  |
| **Homework:**  | **Homework: 15.1,** Advanced: 14–24, 26–35 | **Homework: 15.2,** Advanced: 7–22 | **Homework:** ready to go on? Pg. 434, 1-9. Quiz on Friday.  | **Homework:**  |
|  |  |  |  |  |
| Resources and Reflective Notes: |  |

* **Unit 4 Vocabulary**
* **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.
* **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.
* **Residuals** (error). Represents unexplained (or residual) variation after fitting a regression model. **residual** = observed value – predicted value e = y – ŷ. A **residual plot** is a graph that shows the residual values on the vertical axis and the independent (*x*) variable on the horizontal axis.
* **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 (either 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.