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Linear Relationships (Algebra) (8th-9th grade)

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UNDERSTANDING BY DESIGN

Linear Relationships - Algebra

Unit Title: Linear Relationships - Algebra

Grade Level: 8th or 9th grade

Subject/Topic Area(s): Math - Algebra

Designed By: Melanie Webb and Nicole LeGrone

Time Frame: 18-20 days

School District: Spring Branch ISD

School: Spring Branch Middle School

School Address and Phone: 1000 Piney Point Rd.
 Houston, TX 77024
 713-251-4400

Brief Summary of Unit (Including curricular context and unit goals):

Students will combine all linear relationships and writing equations to perform a task involving scatter plots and line of fit with and without technology. Includes lessons on writing equations and inequalities in context given slope and a point or two points. Students will choose a data set to analyze and determine the context in which it exists. The student will make a scatter plot and determine a line of fit three ways: pencil and paper, on the computer, with a calculator. The student will analyze and compare their results. The student will justify their results and write a story within their context.

Linear Relationships - Algebra

Stage 1 – Desired Results					
<p style="text-align: center;">Established Goals (e.g., standards)</p> <p>A.2 Linear functions, equations, and inequalities. The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations. The student is expected to:</p> <p>(B) write linear equations in two variables in various forms, including $y=mx+b$, $Ax+By=C$, and $y-y_1=m(x-x_1)$, given one point and the slope and given two points.</p> <p>(C) write linear equations in two variables given a table of values, a graph, and a verbal description.</p> <p>(E) write the equation of a line that contains a given point and is parallel to a given line.</p> <p>(F) write the equation of a line that contains a given point and is perpendicular to a given line.</p> <p>(G) write an equation of a line that is parallel or perpendicular to the x- or y-axis, and determine whether the slope of the line is zero or undefined.</p> <p>(H) write linear inequalities in two variables given a table of values, a graph, and a verbal description.</p> <p>A.3 Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations. The student is expected to:</p> <p>(A) determine the slope of a line given a table of values, a graph, two points on a line, and an equation written in various forms including $y=mx+b$, $Ax+By=C$, and $y-y_1=m(x-x_1)$.</p> <p>A.4 Linear functions, equations, and inequalities. The student applies the mathematical process standards to formulate statistical relationships and evaluate their reasonableness based on real-world data. The student is expected to:</p> <p>(A) Calculate, using technology, the correlation coefficient between two quantitative variables and</p>	<div style="text-align: center; background-color: #e0e0e0; padding: 5px;">Transfer</div> <p><i>Students will independently use their learning to...</i> Justify and analyze numbers in context to make predictions about future problems and situations.</p> <div style="text-align: center; background-color: #e0e0e0; padding: 5px;">Meaning</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Understandings <i>Students will understand that...</i></p> <p>Mathematical restrictions help bring context and reality to data and relationships.</p> <p>Given any representation you can find the information you need using the data provided.</p> <p>We write linear functions to model linear relationships to extrapolate and interpolate information from data.</p> <p>We have a better understanding of relationships when we identify and distinguish the difference between the cause and effect in a given scenario.</p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Essential Questions</p> <p>Is it possible to make infinity work in a realistic context? If so, how is this done?</p> <p>What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>How can we use math to make decisions about the future?</p> <p>Why do we care about distinguishing the difference between cause and effect in a given scenario?</p> <p>Why do numbers need context?</p> </td> </tr> </table> <div style="text-align: center; background-color: #e0e0e0; padding: 5px;">Acquisition</div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Knowledge <i>Students will know...</i></p> <p>That slope and y-intercept have real world context and can be identified in word problems. Association does not imply causation.</p> <p>Real world data can have different levels of strength in their correlation and therefore different implications about data.</p> <p>Writing equations to represent linear relationships allows us to extract information and make predictions.</p> <p>A single line can be represented in many different equivalent forms.</p> </td> <td style="width: 50%; vertical-align: top; padding: 5px;"> <p>Skills <i>Students will be able to...</i></p> <p>Determine the slope of a line from a table of values, graph, two points, and an equation written in various forms.</p> <p>Calculate correlation coefficient and linear regression using a calculator and determine the strength of the linear relationship.</p> <p>Write lines of best fit to make predictions.</p> <p>Write equations from tables, graphs, verbal descriptions, given two points, and given one point</p> </td> </tr> </table>	<p>Understandings <i>Students will understand that...</i></p> <p>Mathematical restrictions help bring context and reality to data and relationships.</p> <p>Given any representation you can find the information you need using the data provided.</p> <p>We write linear functions to model linear relationships to extrapolate and interpolate information from data.</p> <p>We have a better understanding of relationships when we identify and distinguish the difference between the cause and effect in a given scenario.</p>	<p>Essential Questions</p> <p>Is it possible to make infinity work in a realistic context? 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<p>interpret this quantity as a measure of the strength of the linear association.</p> <p>(B) Compare and contrast association and causation in real-world problems.</p> <p>(C) Write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems.</p>		<p>and the slope in slope intercept, point slope, and standard form.</p> <p>Write inequalities from graphs, and verbal descriptions in various forms.</p> <p>Use properties of the slopes of perpendicular and parallel lines to write linear equations</p>
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Stage 2 – Evidence

CODE (M or T)	Evaluative Criteria (for rubric)	
<p>M</p> <p>T</p> <p>M</p> <p>T</p> <p>M</p>	<p>Give justification for assigned real-world context (Assign Independent/ Dependent).</p> <p>Create 3 lines of fit.</p> <p>Interpret the significance of the slope and y intercept of the line of fit.</p> <p>Reasonable restrictions in place.</p> <p>Determine the strength of the association by calculating the correlation coefficient</p>	<p>Performance Task(s) <i>Students will demonstrate meaning-making and transfer by...</i></p> <p>Choosing a data set to analyze and determine the context in which it exists. The student will make a scatter plot and determine a line of fit three ways: pencil and paper, on the computer, with a calculator. The student will analyze and compare their results. The student will justify their results and write a story within their context.</p> <hr style="border-top: 1px dashed black;"/> <p>Other Evidence (e.g., formative) Warm Ups Homework Quizzes Exit Tickets Test</p>

Stage 3 – Learning Plan

CODE (A, M, T)	Pre-Assessment <i>How will you check students' prior knowledge, skill levels, and potential misconceptions?</i>	
<p>A</p>	<p>Learning Activities</p> <p>Day One - Independent/Dependent Warm Up – Cause and Effect Card Match Up Cause or Effect? Pass out cards, students get into pairs with corresponding cause and effect. Students have to decide who is the cause and who is the effect. Examples: “Joe has a cavity” (effect) is paired with “He forgot to brush his teeth twice a day” (cause). Discussion - Discuss with students, what is cause and effect? Why do we care what “comes first”? When we did the warm up how did you decide who your partner was? EQ Focus - Why do we care about distinguishing the difference between cause and effect in a given scenario?</p>	<p>Progress Monitoring (e.g., formative data)</p>

M	<p>Lesson - Independent and Dependent Variables. In a linear equation we have two variables, x and y. One of these is Independent/Manipulated, and the other is the Dependent/Responsive variable, kind of like cause and effect. Given examples, which is which and why does it matter? Think about how slope is always change in y over change in x. What if people identify different x's and y's? (DRY MIX is a way to remember Dependent/Responsive/Y, Manipulated/Independent/X)</p> <p>Activity - With a partner, students complete "Independent and Dependent Variables" and decide which would be identified as x or y in an equation.</p> <p>Homework - A note from the authors: At the time of the units writing, homework assignments were only included if the purpose was apparent and appealing at the time. Homework can be an important part of assessment in some classrooms, so feel free to add or adapt homework even if not included.</p>	
M	<p>Day Two - Writing Equations given Slope and a Point</p> <p>Warm Up - Writing Slope-Intercept form from a verbal description. Ask students how they determined what was x and what was y, connecting to the previous lesson on independent and dependent variables.</p> <p>Discussion - Discuss with students, what is the meaning of the slope in a verbal description? What is the meaning of the y-intercept? Why is it important to identify what is the independent and dependent variable when writing a linear equation from a verbal description? Can we also use identifying independent and dependent variables to help us make (known) reasonable restrictions?</p> <p>EQ Focus - Is it possible to make infinity work in a realistic context? If so, how is this done? What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p>	
A	<p>Lesson - Students take notes on the 3 different forms of linear equations. Practice writing equations from numerical examples along with verbal descriptions. Not every verbal description (word problem) is given in a form that would make sense to write a slope-intercept equation. For verbal descriptions, reinforce conclusions made during the discussion about the importance of identifying the independent and dependent variable.</p>	
M	<p>Day Three - Writing Equations given Slope and a Point (Cont'd)</p> <p>Warm Up - Equation Word Problem Swap. Students are given an equation and must write the corresponding word problem, the paper is flipped and they trade it with their partner. The partner tries to recreate the original equation.</p> <p>Discussion - Did everyone's equations match? If not, what do you think was the issue? Diagnose any misunderstandings from the previous day.</p> <p>EQ Focus - What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another? How can we use math to make decisions about the future?</p>	
T	<p>Activity - Equations Match Up. Groups of four are given 40 cards that have matching verbal descriptions, slope-intercept form, standard form equations, graphs, and tables.</p> <p>Homework - Students will be given word problems in which they must write the equations (given slope and one point) and make a prediction based on the equation. Most likely from the textbook or a simple handout.</p>	
M	<p>Day Four - Writing Equations with Two Points</p> <p>Warm Up - Have students find the rate of change given two data points in 3 verbal descriptions. Students will realize that they need to discern what is the independent and dependent variable before they try to find the rate of change. The first two examples should have recognizable independent and dependent variables. In the last example, the difference between the independent and dependent shouldn't be as clear.</p> <p>Discussion - Discuss with students how the last example differed from the first two and why it was okay that people had different answers. Discuss the</p>	

A	<p>importance of justification when identifying the independent and dependent variable. Explain the importance of justifying your reasoning whenever it seems ambiguous. For example: miles per hour versus minutes per mile...how can time be independent in one scenario and dependent in another?</p> <p>EQ Focus - What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another? Why do we care about distinguishing the difference between cause and effect in a given scenario?</p> <p>Lesson - Students will take notes on writing equations in the three forms using two points given two ordered pairs, a table of values, a graph, and verbal descriptions.</p>	
T	<p>Day Five - Writing Equations with Two Points (Cont'd)</p> <p>Warm Up - Write an equation given two ordered pairs. Give the equation in the three forms.</p> <p>Discussion - From these equations, could you generate a table of values? Discuss with your partner one or two possible scenarios that could match the data and equations. Interpret the meaning of your variables and assign which is independent and dependent within the context of your scenario.</p> <p>EQ Focus - What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another? Why do we care about distinguishing the difference between cause and effect in a given scenario?</p> <p>Activity - Writing Equations from Data. Give students a piece of paper that either has two ordered pairs or table of values. Depending on what they are given, they need to generate all of the missing components including verbal description and equation in 3 forms. For example, if a student was given two ordered pairs, they would need to write the equation in each of the three forms, generate a table of values, and come up with a verbal description to match the situation. Once they have completed this, they need to find the people that have the matching linear relationship and compare their results.</p> <p>Once they do this, there will be a ticket out the door with 3-5 problems that assesses their ability to write a linear equation in any form given slope and a point, or two points.</p> <p>Homework - Students will be given word problems in which they must write the equations (given two points) and make a prediction based on the equation. Most likely from the textbook or a simple handout.</p>	
T	<p>Day Six - Short Quiz</p> <p>EQ Focus - Is it possible to make infinity work in a realistic context? If so, how is this done? What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>Activity - Students take a 10 question quiz that assesses their ability to identify and distinguish between independent and dependent variables and writing linear equations in the three different forms. After the quiz, students will have practice problems that review graphing inequalities in the coordinate plane.</p> <p>Homework - Review graphing inequalities on the coordinate plane.</p>	
A/M	<p>Day Seven - Inequalities</p> <p>Warm Up - Students will be given a verbal description given two data points and will be asked to write an equation to represent the relationship. After they have their equations, the words are altered so they have to change their equation to an inequality.</p> <p>Discussion - Discuss with students the difference between equations and inequalities. Ask students why inequalities might be more useful in terms of making math represent a realistic scenario. Why do we need restrictions in math?</p>	

M	<p>EQ Focus - Is it possible to make infinity work in a realistic context? If so, how is this done? What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>Lesson - Students take notes on example. From verbal description, write inequality. Use TI-84 Plus to graph the inequality. Choose one point from shaded region and give the solution verbally.</p> <p>Activity – Inequalities. Self-check activity: Given a verbal description, students will write the inequalities, and use the graph on the calculator to give one possible solution from the shaded region verbally. Students should have somewhere to check their answers for writing the inequality.</p> <p>Day Eight- Inequalities (Cont'd)</p> <p>Warm Up - Write inequalities based on two different word problems and give a possible solution verbally.</p> <p>Discussion - Why can we give so many different possible solutions? Are there solutions in the shaded region that are not reasonable? This is a good time to also discuss the equations of the axes and vertical and horizontal lines.</p> <p>EQ Focus - Is it possible to make infinity work in a realistic context? If so, how is this done? What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>Activity - Equation and Inequality Mix Up. The students sort equation/inequality word problem cards into two groups and justify their reasoning. What do the word problems sorted into the “Equations” group have in common? What do the word problems sorted into the “Inequalities” group have in common? From these word problems the student must choose 6 (3 Equations/3 Inequalities) to write. Determine the independent and dependent variables, write the equation or inequality, and determine reasonable restrictions if applicable. For the equations, they must state a prediction, and for the inequalities, they must verbally state a possible/likely solution.</p>	
T		
A	<p>Day Nine- Parallel and Perpendicular</p> <p>Warm Up - Ask students to recall prior knowledge of properties of parallel and perpendicular lines.</p> <p>Discussion - When we look at equations of lines in the coordinate plane, there is a relationship between equations of parallel and perpendicular lines. Ask students to make hypotheses about things they might see before they investigate.</p> <p>EQ Focus - What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>Activity - Students use the geogebra link to discover the relationship between the slopes of parallel and perpendicular lines. Students will simply be directed to the link and will be asked to adjust the sliders and record what they notice about the relationship between parallel and perpendicular equations. Students should have the opportunity to explore individually, then check with a partner and write a conjecture about the relationship between equations of parallel and perpendicular lines.</p>	
A	<p>GEOGEBRA-LINK</p>	
A	<p>Lesson - Students will take notes on writing equations of lines that are parallel or perpendicular to a given line.</p> <p>Day Ten- Parallel and Perpendicular (Cont'd)</p> <p>Warm Up - Give students a horizontal line and ask them to write the equation along with a corresponding parallel and perpendicular line. For example, give a horizontal line at $y=3$ writing a line parallel to that could be any line in the form $y=$ _____. To write the equation of a perpendicular line would be a vertical line in the form $x =$ _____</p> <p>Discussion - Ask students what they notice about the format of vertical and horizontal lines. Push them to justify why it makes sense for vertical lines to look like $x =$ and horizontal lines to look $y=$</p>	

M	<p>EQ Focus - What is the value of having different forms of equations? How do I know when it would be more beneficial to use one form over another?</p> <p>Activity - Mixed Practice - Writing Equations including parallel and perpendicular lines. "Parallel, Perpendicular, or neither"</p>	
A	<p>Day Eleven- Scatterplots - Association and Line of Best Fit</p> <p>Warm Up - Students have three stickers or dots to place on three scatterplots around the room to model the three types of scatterplots: positive association, negative association, and no association. For example, length of foot in inches versus height in inches would be a positive association. Distance from basket and number of shots made would be negative association. Number of sibling and number of pets would be no association.</p> <p>Discussion - Do one of the variables cause the other? Association versus causation - just because two things follow the same trend, is one CAUSED by the other? Causation occurs when a change in one variable produces the change in another variable. Association can be observed between variables, but might be caused by a third variable or just coincidence (for example - shark attacks occur more often when more ice cream cones are sold, the cause is more likely summer months). Causation can only be determined from data collected in a controlled experiment.</p>	
A	<p>EQ Focus - How can we use math to make decisions about the future?</p> <p>Lesson - Students will take notes on how to create a line of best fit by hand to illustrate the perceived linear relationship of a scatterplot.</p> <p>Step 1: Students are given data. They use the data to make a scatter plot. They have to decide if any relationship exists.</p> <p>Step 2: Draw a line that seems to pass close to most of the data points.</p> <p>Step 3: Use two points on the line of fit to write an equation for the line</p>	
M	<p>Activity - Line of Fit – Ready, Scatterplot, Set, Go! Students will receive 6 scatter plots and will find the line of best fit in slope-intercept form by hand. They will find 3 classmates to compare equations and write a reflection statement about whether they are close and who had the strongest line of best fit. Students will defend their answers with justification.</p>	
T	<p>Homework – Give students data sets in which they must create a scatter plot and write a line of fit. They will use their equation to make predictions. Most likely from the textbook or a simple handout.</p>	
M	<p>Day Twelve - Scatterplots - Association and Line of Fit</p> <p>Warm Up - Students are given a scatter plot that has an obvious but weak correlation and are asked to attempt to write a line of fit. Because it is weak, students will have very different lines of fit.</p> <p>Discussion - Why do we want to find the line of fit? (To make predictions. Also, to give meaning and context to data in terms of rate of change). If the scatter plot has a weak correlation, how will that affect our predictions? Are we married to this line of fit? Why or why not? Does the world operate linearly?</p> <p>EQ Focus - Is it possible to make infinity work in a realistic context? If so, how is this done? How can we use math to make decisions about the future?</p> <p>Lesson - Vocabulary: Interpolate and Extrapolate. We can use points on the fit line to estimate values that are not in the data. When we estimate values that are between known values, it is interpolation. When we estimate a value outside of the range, it is extrapolation. We will work through finding the line of fit for a positive and a negative correlation. Within those examples, we will interpolate and extrapolate information. Students will need to reinforce the importance of establishing a context for domain and range when extrapolating information so that it makes sense in the context of the problem. Teacher should go over one more example with students where they see a demonstration of entering data on</p>	

M/T	<p>Desmos and finding a line of best fit. Instructions for how to do this should be projected on the screen while students work through activity.</p> <p>Activity - Line of Fit using Desmos. Students will receive 2 sets of data in table format and will graph them on Desmos, find the line of fit, compare their line with another group's line, and make a statement of interpolation and extrapolation in the context of their situation. They will snip a picture of their Desmos line of fit and type their equation and two statements of interpolation and extrapolation on a document and will upload it electronically.</p>	
M	<p>Day Thirteen - Linear Regression and Correlation Coefficient</p> <p>Warm Up - Students will come in and copy down the steps to linear regression into their notebooks. Given a set of data, they will attempt to follow the steps and struggle through the example (give about 10 minutes).</p> <p>Discussion - What makes a line of fit better than others?</p> <p>EQ Focus - How can we use math to make decisions about the future?</p> <p>Lesson - How to use the calculator to give us the equation for the line of best fit. What is correlation coefficient and what does it mean for my data? Using a set of data from the day previous, we will use the calculator (TI-84 Plus to perform linear regression and find the correlation coefficient. We can compare our results from the day previous and ask, is either answer "wrong"? Is one equation better than the other? How would the equation we choose to use affect our predictions?</p> <p>Step 1: Enter Data into STAT/Edit. Enter Independent Value into List 1 (L1) and Dependent Value into List 2 (L2). Step 2: Perform Linear Regression by pressing STAT/Calc. Scroll down to LinReg (ax+b) and press enter twice</p>	
T	<p>Students will discuss the meaning of the correlation coefficient and how the linear regression, slope, and y-intercept compare with their equations from the day before. How does the correlation coefficient help us determine whether we can trust our equations and therefore our predictions?</p> <p>Activity - You vs. The Calculator. Students will have two tables of data. For each set they must 1) Create a scatterplot. 2) Make a line of best fit by hand and write an equation using two points. 3) Write an equation using linear regression. 4) Compare the two equations. 5) State the correlation coefficient and what that means to the data.</p>	
T	<p>Day Fourteen - Put it all together. Mixed Practice.</p> <p>Warm Up - Students will have a list of data points given in ordered pairs. Students will work with their partner to find the line of best fit using Desmos and the linear regression function of the calculator. Students will compare the two equations that they created and make conclusions about differences if they exist.</p> <p>Discussion - Compare equations as a class and come up with a reasonable measure of the accuracy of the equation. For example, what should the rate of change be close to for all the equations? What are unreasonable answers for rate of change? Ask students to come up with 3 different contexts this data could describe.</p> <p>EQ Focus - How can we use math to make decisions about the future?</p> <p>Activity - Finish the Poem - Students will solve problems based in this unit's standards to finish a poem. Questions are pulled from multiple choice released STAAR questions.</p>	
T	<p>Day Fifteen and Sixteen - Performance Assessment</p>	
T	<p>Day Seventeen - Test Review</p> <p>Day Eighteen - TEST</p>	

What's Going On? Teacher Notes

Performance Assessment

Give students choice or assign one unlabeled set of data. Each set has data points that have a “linear” relationship (scatter plot with positive or negative association) and the student comes up with context. They will write a story on how data is connected.

The student will determine the context in which the two variables relate to each other in a linear pattern. Then they will graph ordered pairs on Desmos or a different online graphing mechanism. On Desmos, they can adjust sliders to find the line of fit. From there they can interpolate and extrapolate information from the linear function. If you think you have time, have students with the same data sets present to each other to share their different context and compare their findings. Students can work in pairs, but should have an individual option for those that prefer to work alone.

Possible data sets to choose from:

Original context:

Data Set A - {(3, 12.50) (12, 54.90) (8, 37.90) (4, 17.10) (2, 7.60) (10, 49.20) (1, 2.50) (6, 24.30)}	Weight of a Panda at age in months
Data Set B - {(10, 2.5) (11, 2.8) (9, 2.3) (10, 2.6) (13, 3.3) (5, 1.3) (8, 2.2) (4, 1.1)}	Gasoline purchases (gallons bought/dollars spent)
Data Set C - {(0, 59) (4500, 12.4) (500, 59.2) (3000, 29.9) (4000, 26.2) (1500, 55.5) (1000, 61.3) (2500, 29.8) (3500, 18.1) (2000, 41.6)}	Plane altitude and outside temperature
Data Set D - {(2000, 3508) (2004, 5126) (2006, 5836) (2001, 3766) (2002, 4098) (2005, 5492) (2003, 4645)}	Average tuition and fees at public 4-year colleges
Data Set E - {(2001, 25.1) (2004, 25.3) (2011, 26.9) (2009, 26.5) (2005, 25.5) (2002, 25.3) (2010, 26.7) (2006, 25.9) (2003, 25.3) (2007, 26) (2008, 26.2)}	Median age of females when they were first married
Data Set F - {(62, 115) (73, 168) (73, 166) (67, 140) (68, 152) (67, 134) (68, 144) (63, 124) (65, 120) (68, 152) (72m 155) (69, 147)}	Height (in) and weight (lbs)
Data Set G - {(2, 55) (3, 72) (1.5, 48) (5, 100) (4.5, 93) (2.5, 70) (4, 82) (3.5, 74)}	Duration of Old Faithful's eruption and interval to next eruption

What's Going On?

Performance Assessment

You will be using all you have learned this unit and your very awesome brain to complete the task of giving context to a set of data, writing the equation of the line of fit, and making predictions based on your equation. It's all up to you to decide your context! You can be as creative as you want. You can do it!

Context

Step 1: Choose data set analyze to create a corresponding real world situation. Within the situation, identify and determine which variables are manipulated and responsive.

Which side is your x variable? Organize from least to greatest. Make sure you keep your pairs together!

Organize your data into this table

Independent	Dependent
Justification. What made you choose these variables?	

Graph

Step 2: Using Desmos.com, graph the ordered pairs in the given set of data. Type slope intercept form equation and add sliders. Adjust the sliders to find the line of best fit. Write your equation below.

Equation: _____

Step 3: Snip your graph for use in your presentation.

Step 4: Pick two points on your graph that lie close to your line of best fit. Using these two points, determine your equation algebraically. Show your work! Write your equation below.

Two points () ()
Slope: _____ Y-intercept: _____ Equation: _____

Step 5: Interpret the meaning of the slope and y-intercept. Make sure to address the context of your relationship and that it makes sense in this context.

--

Step 6: Take your equation from step 4 and write it in standard form. Using the standard form equation, find the x intercept. Determine if the x intercept has a significance in the context of your problem.

Standard form:	X intercept:
Does the x intercept have significance? Why or Why not?	

Step 7: Compare the 2 equations that you have discovered using algebra and Desmos. Compare the slope, compare the y intercept. How are they different? Which one do you think is more accurate and why?

Step 8: Using your calculator, input your data and find the line of best fit using linear regression. Refer to page 255 in your book for instructions. Write your equation below along with the correlation coefficient. Interpret the meaning of the correlation coefficient in the context of your real world scenario.

Equation: _____ Correlation Coefficient: _____

What does your correlation coefficient tell you in the context of your problem?

Step 9: Using your Desmos representation of the data, create restrictions on your domain and range that make sense in the context of your real world scenario. Type these restrictions on your Desmos page, snip this image and save it to put in your presentation.

Step 10: Using text boxes in your presentation, title your graph and label your x and y axis. Be sure to add another text box that shows your domain and range in inequality form.

Conclusion

Step 11: In conclusion, write complete sentences that gives the background story for the data. Choose 2-4 points to specifically address and interpret their meaning. Also, be sure to identify and explain the significance of the slope and y-intercept.

Step 12: Use your linear equation to predict values within the range of your data (interpolation). Then, use your linear equation to predict a value outside of the range of your data (extrapolation). Be sure to explain the significance of these data points.

What's Going On?

Performance Assessment

Criteria for Success

	Not Included	Below Expectations	Approaching Expectations	Meeting Expectations	Exceeding Expectations
Context and Justification		Context is not reasonable. Justification is not realistic or written in complete sentences.	Context is reasonable. Justification is written in complete sentences and easy to follow.	Context is reasonable. Justification is well written and easy to follow.	Context is creative and reasonable. Justification is well written, realistic, and easy to follow.
Desmos Line of Fit		Included in presentation. Restrictions/title/axis labeled/ justified are missing.	Included in presentation. Restrictions/title/axis labeled/ justified are messy or do not match context.	Included in presentation with restrictions/title/axis labeled/ justified in well-written sentences.	Included in presentation with restrictions/title/axis labeled/ justified in well-written sentences. Student goes above and beyond with the justification in terms of context.
Algebraic Line of Fit		Work is missing or inaccurate.	All work is shown. 1-2 errors	All work is shown and accurate	All work is shown, accurate, and easy to follow.
Linear Regression		Comparisons between lines of fit are incorrect or nonsensical. Linear regression and correlation coefficient are present but not justified.	Comparisons between lines of fit are basic. Linear regression and correlation coefficient are present and justified.	Comparisons between lines of fit are basic. Linear regression and correlation coefficient are present, correct and justified.	Comparisons between lines of fit are insightful and thought out. Linear regression and correlation coefficient are present and justified.
Presentation		Missing 2 or more parts of the performance task	Most parts of performance task are included. Missing one item here or there.	All parts of performance task are included.	Everything is included and organized. It is pleasing to the eye, and well edited.
Conclusion		Background data is not included for context or a paragraph with complete sentences. Predictions do not fit the scenario or are nonsensical.	Background data is included for context in a paragraph with complete sentences. Predictions are included in paragraph form and significance is clear.	Background data is included for context in a well-written paragraph. Predictions are included in paragraph form and significance is clear.	Background data is included for context in a creative and well-written paragraph. Predictions are included in paragraph form and significance is clear.

DOUBLE CHECK before submitting:

<p>My conclusion included</p> <ul style="list-style-type: none"> <input type="checkbox"/> The story gives the context of my data. <input type="checkbox"/> Independent and dependent variables were determined <input type="checkbox"/> Points were assigned variables and used within the story <input type="checkbox"/> My story gave context to the slope and y-intercept <input type="checkbox"/> Reasonable restrictions were included within the context. <input type="checkbox"/> I wrote about my predictions within the context of my story <input type="checkbox"/> My paragraph was edited for grammar and spelling errors 	<p>My Presentation Included</p> <ul style="list-style-type: none"> <input type="checkbox"/> The context and story I've given my data <input type="checkbox"/> My Desmos Graph with restrictions and labels <input type="checkbox"/> My information from my linear regression <input type="checkbox"/> A slide or paragraph that compares my equations <input type="checkbox"/> My conclusion
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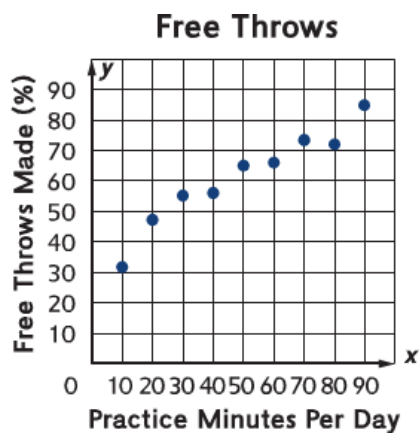
Name:

Writing Linear Equations Pre-Assessment (No Fault)

1. Write the equation for the line that has a slope 3 and include the point $(-2, 5)$
2. Write the equation for the line that includes the points $(3, -9)$ and $(-7, 11)$
3. Juan's income y consists of at least \$37,500 salary plus 5% commission on all of his sales x .
 - a. Write an inequality that represents Juan's income in one year.
 - b. Give a possible solution for Juan's future sales and salary.
4. Give the slope of a line that is parallel to $y = 2x + 6$

Give the slope of a line that is perpendicular to $y = 2x + 6$

5. From this scatter plot, write the equations of a line of fit.



Cause and Effect Card Match Up

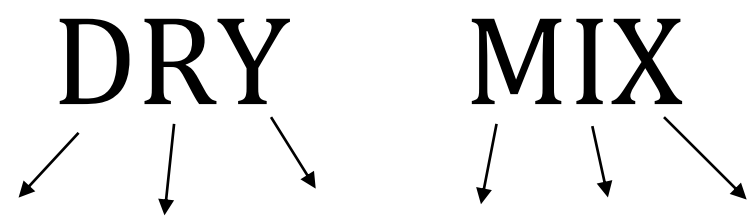
A student forgot to brush their teeth twice a day	A student has a cavity
A student brushes their teeth twice a day	A student has never had a cavity
A student didn't get their hair cut in 3 years	A student has long hair
A student gets their hair cut once a month	A student has had the same length hair for 3 years
A student doesn't study for their biology test	A student fails a biology test
A student studies all night for their biology test	A student gets an A on their biology test
A student lifts weights every day	A student can carry a heavy box of text books
A student has never exercised	A student can't carry a heavy box of text books
A student worked 20 hours in a week	A student was paid \$6 for every hour they worked
A student overslept	A student missed the bus
A student woke up 30 minutes before their alarm	A student was early for the bus
The sidewalk was icy	A student fell on the sidewalk
The sidewalk was shaded by trees	A student did not get sunburnt walking on the sidewalk
A student was speeding	A student got a traffic ticket
A student never broke a traffic law	A student never got a ticket

The weather forecast calls for rain all weekend	The beach fieldtrip was postponed
The weather forecast calls for pleasantly sunny weather	We will plan a daytrip to the beach
The electricity went out	The food in the refrigerator spoiled
The electricity went out	We had to use flashlights in the house
A meteor struck the earth thousands of years ago	Dinosaurs are extinct
Britain enforced the Stamp Act on the colonists	The colonists rebelled and began the Revolutionary war
Colonists needed a document that represented their separation from Britain	Tomas Jefferson wrote the Declaration of Independence
Pollution from cars	Global warming
Reduce, Reuse, and Recycling	A better environment
Flooding in Houston	Water Damage to people's homes
Tornadoes in Kansas	Dorothy flies away to the land of Oz
Dorothy clicks her heels three times and says "there's no place like home"	Dorothy goes back to Kansas
Hermione correctly pronounces "wingardium leviosa"	Hermione's feather flies into the air
Hermione puts cat hair in her polyjuice potion	Hermione turns into a cat
Hermione has a time turner	Hermione can go to all the classes she wants

Name: _____ Date: _____ Algebra Period: _____

Independent and Dependent Variables

A variable is something that _____. In scientific experiments, we have two variables. One that is the _____ and one that is the _____.



****The _____ variable causes the _____ to change!!****

Example: The temperature of the water was measured at different depths of the lake. What is the independent and dependent variable and why?

In the following examples, identify the independent and dependent variable. Write a statement of justification to defend your answer.

The temperature of water and the time it takes for the egg to cook IV: _____ DV: _____ Justify:	The amount of exercise a person gets and the time it takes to run 3 miles. IV: _____ DV: _____ Justify:	The score on a final test and the number of study questions completed IV: _____ DV: _____ Justify:
Academic degrees earned and the individual's annual salary IV: _____ DV: _____ Justify:	The time driven in a car and the distance from home. IV: _____ DV: _____ Justify:	Amount of time worked and the dollars that were earned. IV: _____ DV: _____ Justify:
Amount of free throws made and the amount of time for practice IV: _____ DV: _____ Justify:	The amount of minutes run and the amount of miles completed. IV: _____ DV: _____ Justify:	The amount of miles run and the minutes taken to run them IV: _____ DV: _____ Justify:

Warm Up – Equation Word Problem Swap

Here's your equation:

$$y = 3x - 8$$

Fold here after you write your scenario.

Write your scenario:

What equation matches the scenario?

Here's your equation:

$$y = 9 - .25x$$

Fold here after you write your scenario.

Write your scenario:

What equation matches the scenario?

Here's your equation:

$$2x + 3y = 12$$

Fold here after you write your scenario.

Write your scenario:

What equation matches the scenario?

Here's your equation:

$$\frac{1}{2}x - 4y = 8$$

Write your scenario:

What equation matches the scenario?

Equation Match Up Recording Page

Graph	Standard Form Eqn	Slope-Int Form Eqn	Table	Word Problem Name
A				
B				
C				
D				
E				
F				
G				
H				

$$3x + y = -1$$

$$x + y = 4$$

$$3x + 4y = 8$$

$$2x - y = 4$$

$$x - 2y = 6$$

$$2x - 3y = -3$$

$$2x - y = 0$$

$$2y = 8$$

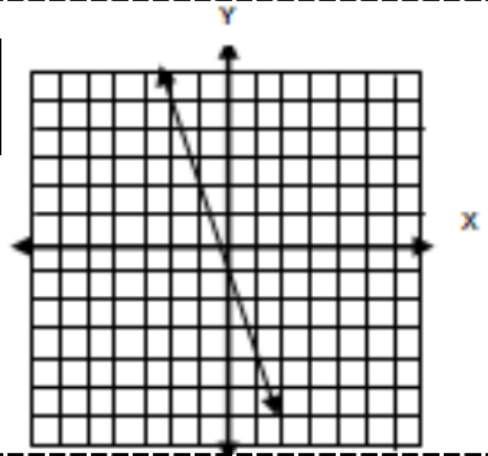
$$y = -3x - 1$$



x	y
2	-7
-1	2
0	-1

Two months after the start of the year, the water level in the Edward's Aquifer was 7 feet below normal. Every month, it dropped three feet as the drought continued.

A



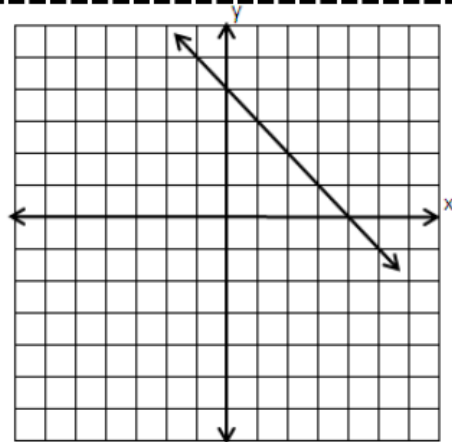
$$y = -x + 4$$



x	y
-3	7
0	4
3	1

Xavier and Yoana have been collecting pennies from couch cushions. Altogether, they have collected four dollars.

B



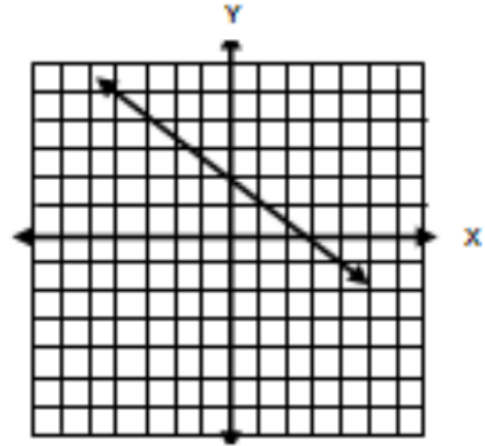
$$y = -\frac{3}{4}x + 2$$



x	y
-4	5
2	$\frac{1}{2}$
4	-1

Hayley likes to be prepared. She was buying two-inch candles in case of a black out. The label on the candle she bought said the type of wax would burn three inches over four hours.

C



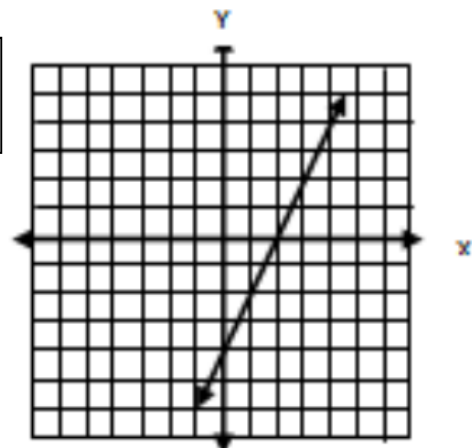
$$y = 2x - 4$$



x	y
-1	-6
0	-4
5	6

Manisha owes her sister four dollars. She earns two dollars each day she walks the dog and does the dishes, so she can earn money to pay her sister back and more!

D



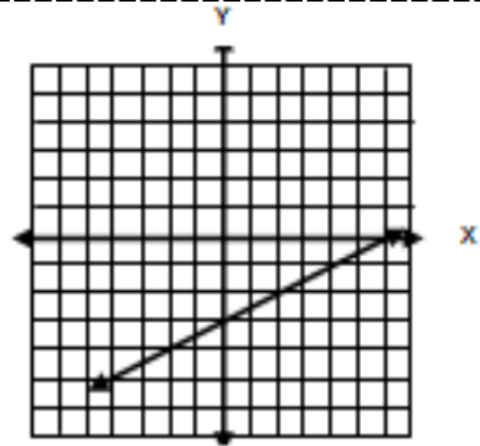
$$y = \frac{1}{2}x - 3$$



x	y
4	1
-2	-4
-6	-6

Chris and his twin brother, Brent, are very competitive. Chris says no matter what, he can beat Brent at a one legged race. He starts 3 meters behind Brent and hops at one meter every two seconds.

E



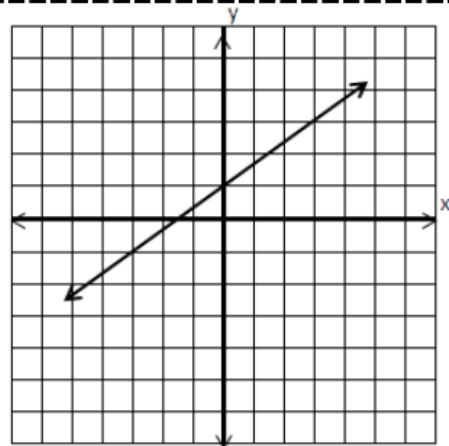
$$y = \frac{2}{3}x + 1$$



x	y
-9	-5
0	1
3	3

Every time Otto brings an A or B grade home on a progress report, his Dad gives him two dollars. If he brings home a D or F, he has to pay his father 3 dollars. At the end of the school year, Otto has lost three dollars.

F



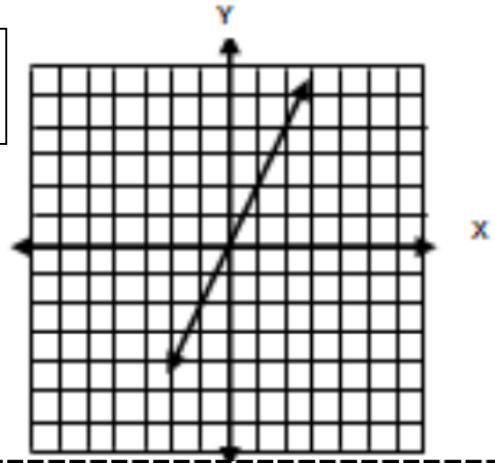
$$y = 2x$$



x	y
-6	-12
0	0
3.5	7

Stargirl has a happy wagon to measure her happiness level daily. If something makes her happy, she puts two pebbles in her wagon. If something makes her sad, she takes one pebble out. Today, her happy wagon ended with the same number of pebbles as it started.

G



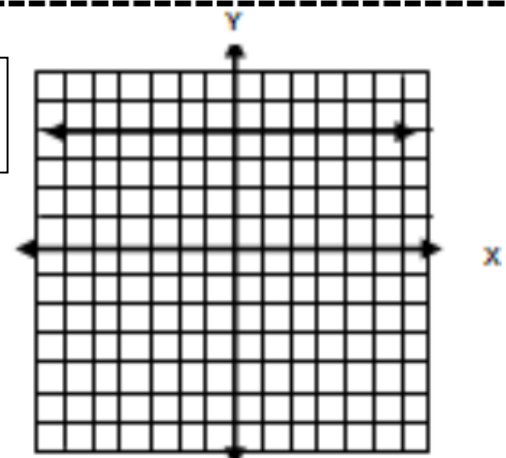
$$y = 4$$



x	y
-1	4
0	4
13	4

Peggy's backpack weighs 8 pounds. Each book in her bag weighs 2 pounds. How much does her backpack weigh?

H



Name: _____ Date: _____ Algebra Pd: _____

Writing Equations from Data

Use whatever information you're given to find the missing components

Ordered Pairs: $(-3, 14)$ $(4, 0)$	Table:
Point Slope Form Equation:	Slope Intercept Form Equation:
Standard Form Equation:	Verbal Description

Name: _____ Date: _____ Algebra Pd: _____

Writing Equations from Data

Use whatever information you're given to find the missing components

Ordered Pairs:	Table: <table border="1"><tr><td>X</td><td>Y</td></tr><tr><td>-4</td><td>16</td></tr><tr><td>-1</td><td>10</td></tr><tr><td>5</td><td>-2</td></tr></table>	X	Y	-4	16	-1	10	5	-2
X	Y								
-4	16								
-1	10								
5	-2								
Point Slope Form Equation:	Slope Intercept Form Equation:								
Standard Form Equation:	Verbal Description								

Name: _____ Date: _____ Algebra Pd: _____

Writing Equations from Data

Use whatever information you're given to find the missing components

Ordered Pairs: $(-5, -40)$ $(-1, -12)$	Table:
Point Slope Form Equation:	Slope Intercept Form Equation:
Standard Form Equation:	Verbal Description

Name: _____ Date: _____ Algebra Pd: _____

Writing Equations from Data

Use whatever information you're given to find the missing components

Ordered Pairs	Table: <table border="1"><tr><td>X</td><td>Y</td></tr><tr><td>-2</td><td>-19</td></tr><tr><td>3</td><td>16</td></tr><tr><td>5</td><td>30</td></tr></table>	X	Y	-2	-19	3	16	5	30
X	Y								
-2	-19								
3	16								
5	30								
Point Slope Form Equation:	Slope Intercept Form Equation:								
Standard Form Equation:	Verbal Description								

Inequalities

Verbal Description	Write the Inequality	Possible Solution in words
Example: The gift shop sells stones for either \$4 or \$6 per stone. Emily has no more than \$30 to spend.	$4x + 6y \leq 30$	Emily can buy four \$4 stones and two \$6 stones
1. The minimum wage for one group of workers in Texas is \$7.25 per hour effective Sept. 1, 2008. Write an inequality describing the wages, y , based on the number of hours worked, x .		
2. The Camp Courage Club plans to sell tins of popcorn and peanuts as a fundraiser. The Club members have \$900 to spend on products to sell. Each tin of popcorn costs \$3 and each tin of peanuts costs \$4.		
3. Shannon earns \$5 per hour babysit and \$10 per hour tutoring. She wants to at least \$400 this summer.		
4. A long board must be split into four sections, so that each section is at most 3.5 feet long. What is the maximum length the board can be?		
5. A block sculpture has more blocks than 4 times the number of levels plus 10.		
6. Harry and Ron went out to dinner. Harry paid the tip of \$10 because his dinner plus tip was still less than Ron's dinner.		
7. Mr. Tucker is ordering pizzas and breadsticks for his daughter's pizza party and has a budget of \$81. An order of breadsticks costs \$7 and a pizza costs \$13.		
8. Rafael doesn't let anyone beat him at running laps around the track. He always has to run at least a lap more than twice the laps of his arch nemesis.		
9. Department stores adjust the price of their clothes seasonally. The price of a suit jacket cannot be more than \$20 above 3 times the price of the matching pants.		

Equation and Inequality Mix Up

<p>An interior decorator is going to remodel a kitchen. The wall above the stove and the counter is going to be redone as shown. The owners can spend at most \$420.</p>	<p>The amount of storage left on a camera memory chip is 512 MB before any pictures are taken. Each picture takes away 3 MB of memory.</p>
<p>For a party you can spend no more than \$12 on candy. Skittles cost \$2 per pound and Starburst cost \$4 per pound.</p>	<p>The distance around a circle is Pi times the diameter</p>
<p>At a fruit store, each watermelon weighs 3kg and each coconut weighs 2kg. A container with watermelons and coconuts has a capacity of 100kg.</p>	<p>You can estimate the number of chirps of the snowy tree cricket. The outdoor temperature is 40°F more than one-fourth the number of chirps the cricket makes in one minute.</p>
<p>The length of a rectangle must be greater than three less than five times the width</p>	<p>The price of a pizza is \$6.95 plus \$.95 for each topping on the pizza.</p>
<p>A company makes nylon and canvas backpacks. The profit on a nylon backpack is \$20 and on a canvas backpack is \$50. How many backpacks must the company sell to make a profit of more than \$100?</p>	<p>The amount of almond extract remaining in an 8 oz bottle decreases by $\frac{1}{6}$ oz for each batch of cookies made.</p>
<p>My sister seems to go on more than twice the dates I go on.</p>	<p>A 100-point test has some questions worth 2 points and some questions worth 4 points.</p>
<p>A curbside recycling service will remove up to 50 lbs of plastic and paper products each week. They charge \$.25/lb of plastic and \$.75/lb of paper.</p>	<p>Louise has \$36 in five-dollar bills and singles. How many of each type of bill does she have?</p>

Name: _____ Algebra Pre-AP/GT Period: _____

Equation and Inequality Mix Up

After you have sorted your equations and inequalities, check to make sure you have classified the word problems correctly. Now you can complete your task by choosing three equations and three inequalities to write algebraically.

Equations	Prediction in words

Inequalities	Possible Solution in words

Name: _____ Algebra Pre-AP/GT Period: _____

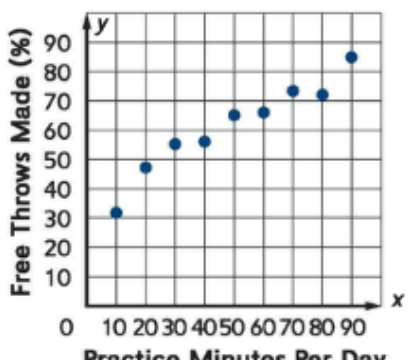
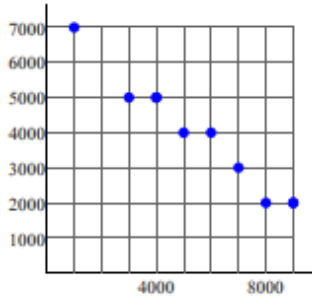
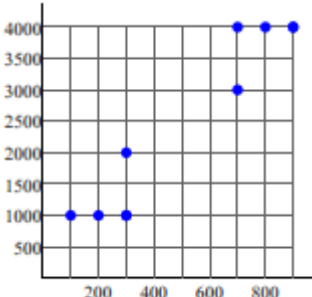
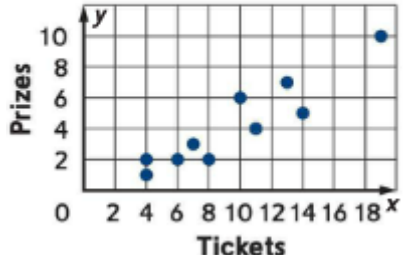
Equation and Inequality Mix Up

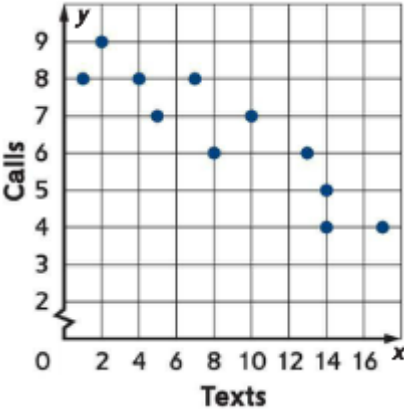
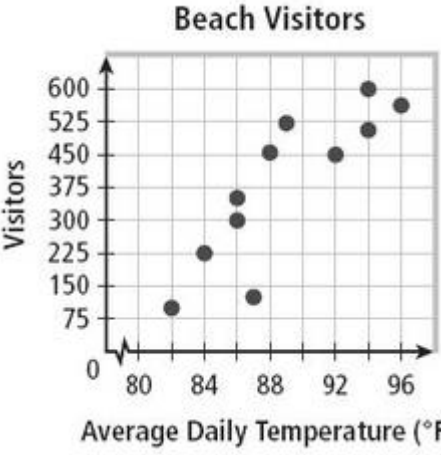
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Equations	Prediction in words

Inequalities	Possible Solution in words

Line of Fit – Ready, Scatterplot, Set, Go!

Scatterplot – Draw your line of fit	My Line of Fit Equation Show Work!	My classmate’s Lines of Fit DO NOT CHANGE YOUR EQUATION BECAUSE IT IS DIFFERENT																						
<p style="text-align: center;">Free Throws</p>  <table border="1" style="display: none;"> <caption>Data for Free Throws</caption> <thead> <tr> <th>Practice Minutes Per Day</th> <th>Free Throws Made (%)</th> </tr> </thead> <tbody> <tr><td>10</td><td>32</td></tr> <tr><td>20</td><td>48</td></tr> <tr><td>30</td><td>55</td></tr> <tr><td>40</td><td>58</td></tr> <tr><td>50</td><td>65</td></tr> <tr><td>60</td><td>68</td></tr> <tr><td>70</td><td>75</td></tr> <tr><td>80</td><td>72</td></tr> <tr><td>90</td><td>85</td></tr> </tbody> </table>	Practice Minutes Per Day	Free Throws Made (%)	10	32	20	48	30	55	40	58	50	65	60	68	70	75	80	72	90	85		<p>1.</p> <p>2.</p> <p>3.</p>		
Practice Minutes Per Day	Free Throws Made (%)																							
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 <table border="1" style="display: none;"> <caption>Data for Scatterplot 2</caption> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>1000</td><td>7000</td></tr> <tr><td>3000</td><td>5000</td></tr> <tr><td>4000</td><td>5000</td></tr> <tr><td>5000</td><td>4000</td></tr> <tr><td>6000</td><td>4000</td></tr> <tr><td>7000</td><td>3000</td></tr> <tr><td>8000</td><td>2000</td></tr> <tr><td>9000</td><td>2000</td></tr> </tbody> </table>	x	y	1000	7000	3000	5000	4000	5000	5000	4000	6000	4000	7000	3000	8000	2000	9000	2000		<p>1.</p> <p>2.</p> <p>3.</p>				
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800	4000																							
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<p style="text-align: center;">Game Tickets at the Fair</p>  <table border="1" style="display: none;"> <caption>Data for Game Tickets at the Fair</caption> <thead> <tr> <th>Tickets</th> <th>Prizes</th> </tr> </thead> <tbody> <tr><td>4</td><td>1.5</td></tr> <tr><td>4</td><td>2</td></tr> <tr><td>6</td><td>2</td></tr> <tr><td>6</td><td>3</td></tr> <tr><td>8</td><td>2</td></tr> <tr><td>10</td><td>6</td></tr> <tr><td>12</td><td>4</td></tr> <tr><td>13</td><td>7</td></tr> <tr><td>14</td><td>5</td></tr> <tr><td>18</td><td>10</td></tr> </tbody> </table>	Tickets	Prizes	4	1.5	4	2	6	2	6	3	8	2	10	6	12	4	13	7	14	5	18	10		<p>1.</p> <p>2.</p> <p>3.</p>
Tickets	Prizes																							
4	1.5																							
4	2																							
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6	3																							
8	2																							
10	6																							
12	4																							
13	7																							
14	5																							
18	10																							

Scatterplot – Draw your line of fit	My Line of Fit Equation Show Work!	My classmate’s Lines of Fit DO NOT CHANGE YOUR EQUATION BECAUSE IT IS DIFFERENT
 <p>A scatterplot with 'Texts' on the x-axis (0 to 16) and 'Calls' on the y-axis (0 to 9). The data points are approximately: (1, 8), (2, 9), (4, 8), (5, 7), (7, 8), (8, 6), (10, 7), (13, 6), (14, 5), (14, 4), (15, 4).</p>		1. 2. 3.
 <p>Beach Visitors A scatterplot with 'Average Daily Temperature (°F)' on the x-axis (80 to 96) and 'Visitors' on the y-axis (0 to 600). The data points are approximately: (82, 100), (84, 225), (86, 300), (86, 350), (87, 125), (88, 450), (89, 525), (92, 450), (94, 550), (94, 600), (95, 580).</p>		1. 2. 3.

Reflection:

1. How did you and your classmates’ lines of fit compare? Are they close in value?
 - a. Compare the slopes:
 - b. Compare the y-intercepts:
2. If they are not all similar, give a reason WHY. Look at each other’s’ lines of fit and see if that plays a part in the difference.
3. Are any of the equations more correct than the others? How would you decide this?

Name: _____

Algebra Period: _____

Line of Fit using Desmos

Working with your partner, you will be graphing the following data points on www.Desmos.com. Find the line of fit and answer the questions below

Data Set A

X	Y
10	2.6
11	3
9	2.4
8	2.2
13	3.5

Equation found on Desmos

Comparison with another pair's line of fit

Statement of Interpolation

Statement of Extrapolation

Data Set B

X	Y
0	14
2.2	80
3.4	116
4	134
4.6	152

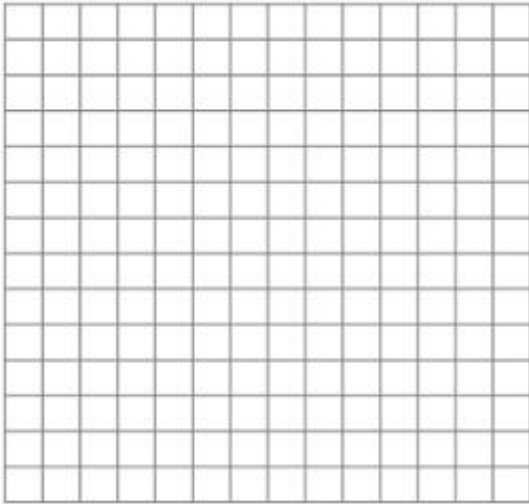
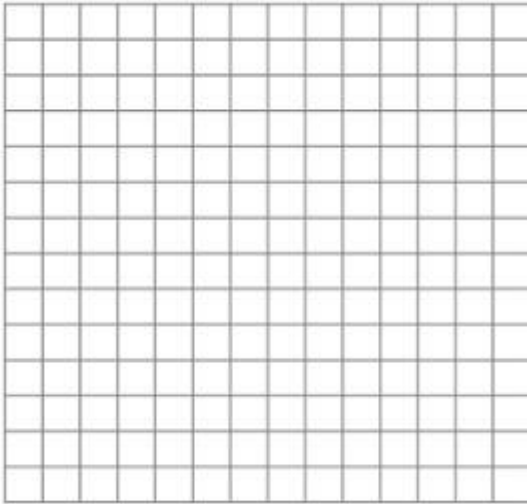
Equation found on Desmos

Comparison with another pair's line of fit

Statement of Interpolation

Statement of Extrapolation

You vs. The Calculator.

SET A – Complete Steps 1-6 with the following set of data	SET B – Complete Steps 1-6 with the following set of data																																		
<p>Weight of an Alligator</p> <table border="1" style="margin: auto;"> <thead> <tr> <th>Age (Weeks)</th> <th>Weight (lbs)</th> </tr> </thead> <tbody> <tr><td>0</td><td>6</td></tr> <tr><td>9</td><td>8.6</td></tr> <tr><td>18</td><td>10</td></tr> <tr><td>27</td><td>13.6</td></tr> <tr><td>34</td><td>15</td></tr> <tr><td>43</td><td>17.2</td></tr> <tr><td>49</td><td>19.8</td></tr> </tbody> </table>	Age (Weeks)	Weight (lbs)	0	6	9	8.6	18	10	27	13.6	34	15	43	17.2	49	19.8	<p>Durations of eruptions of Old Faithful and the intervals between eruptions</p> <table border="1" style="margin: auto;"> <thead> <tr> <th>Duration (min)</th> <th>Interval (min)</th> </tr> </thead> <tbody> <tr><td>1.5</td><td>50</td></tr> <tr><td>2.0</td><td>57</td></tr> <tr><td>2.5</td><td>65</td></tr> <tr><td>3.0</td><td>71</td></tr> <tr><td>3.5</td><td>76</td></tr> <tr><td>4.0</td><td>82</td></tr> <tr><td>4.5</td><td>89</td></tr> <tr><td>5.0</td><td>95</td></tr> </tbody> </table>	Duration (min)	Interval (min)	1.5	50	2.0	57	2.5	65	3.0	71	3.5	76	4.0	82	4.5	89	5.0	95
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<p>1) Create a Scatter Plot</p> <div style="text-align: center;">  </div>	<p>1) Create a Scatter Plot</p> <div style="text-align: center;">  </div>																																		
<p>2) Find your equation for the Line of Fit</p>	<p>2) Find your equation for the Line of Fit</p>																																		
<p>3) Make a prediction: What will the alligator weigh at week 60?</p>	<p>3) Make a prediction: Predict the interval if the last duration of the eruption was 6 minutes.</p>																																		

4) Use the data from the table to perform Linear Regression using your calculator. Write that equation here:	4) Use the data from the table to perform Linear Regression using your calculator. Write that equation here:
5) Compare the equation from Step 2 and Step 4. What is similar? What is different?	5) Compare the equation from Step 2 and Step 4. What is similar? What is different?
6) What is the correlation coefficient and what does that mean to the data and your lines of fit?	6) What is the correlation coefficient and what does that mean to the data and your lines of fit?

7) How can we use math to make decisions about the future?

8) We are finding lines of fit, and we can see how this has been helpful. However, in the real world, does everything follow a linear pattern? Explain your thinking in complete sentences.

Problem	Show your WORK!! Justify!	Answer

A Single _____(1)

A single _____(1) stood all _____(2),

Surrounded by a _____(3) of _____(4).

Around the _____(3) were _____s(1), too.

Still neither _____(5A) the other _____(5B).

So often, we like _____(6) _____(7),

Too _____(8) within our _____(9) _____(10),

And _____(11) through _____(12) not _____(13),

Nor _____(14).