

Richmond Public Schools

Curriculum Framework

Algebra I

Strand: Statistics	
A.9 The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions.	
 EOC Algebra I assessments will include a <u>Desmos Calculator</u>	
Suggested Pacing	
Fourth Nine Weeks- Curve of Best Fit A.9 5 blocks	
Related Standards	
7.9 The student, given data in a practical situation, will a) represent data in a histogram; b) make observations and inferences about data represented in a histogram; and c) compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs. 8.12 The student will a) represent numerical data in boxplots; b) make observations and inferences about data represented in boxplots; and c) compare and analyze two data sets using boxplots.	AII.9 The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of quadratic and exponential functions.
Essential Questions	Common Misconceptions
<ul style="list-style-type: none">What is the process to determine an equation of a curve of best fit? <i>Step 1: Enter the data into L_1 and L_2 on your calculator.</i>	<ul style="list-style-type: none">Students have trouble with data when the graph does not form a perfectly straight line or a perfect quadratic curve. However, the graph may approximate a linear or quadratic

Richmond Public Schools

Curriculum Framework

Algebra 1

<p><i>Step 2 Use your calculator to perform quadratic regression.</i> <i>Step 3: Show that this quadratic model is better than a linear model.</i></p> <ul style="list-style-type: none"> ● How do you make predictions using data, scatter plots, or the equation of the curve of best fit? <i>Draw a line, called a best-fit line that passes close to most of the data points. Approximately half of the data points should be below the line and half of the points above the line. If the data points come close to the best-fit line then the correlation is said to be strong.</i> <ul style="list-style-type: none"> ● How can you solve practical problems involving an equation of the curve of best fit? <i>Step 1: Enter the data into L_1 and L_2 on your calculator.</i> <i>Step 2 Use your calculator to perform quadratic regression.</i> <i>Step 3: Show that this quadratic model is better than a linear model.</i> <ul style="list-style-type: none"> ● How can you evaluate the reasonableness of a curve of best fit for a practical situation? <i>Evaluation of the reasonableness of a mathematical model of a practical situation involves asking questions including: - "Is there another linear or quadratic curve that better fits the data?" - "Does the curve of best fit make sense?" - "Could the curve of best fit be used to make reasonable predictions?"</i> 	<p>relationship.</p> <ul style="list-style-type: none"> ● Refrain from telling students that they are collecting or given data that will produce a linear or quadratic relationship. ● Students erase L_1 in the calculator and then have trouble calculating the regression.
Understanding the Standard	Essential Knowledge and Skills
<ul style="list-style-type: none"> ● Data and scatter plots may indicate patterns that can be modeled with an algebraic equation. 	<p>The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to</p>

Richmond Public Schools

Curriculum Framework

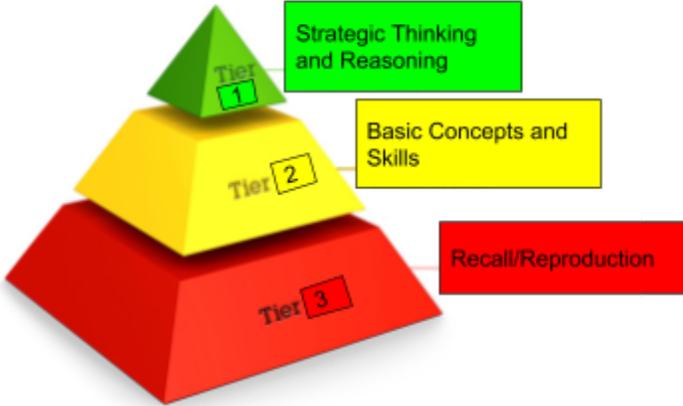
Algebra I

- Determining the curve of best fit for a relationship among a set of data points is a tool for algebraic analysis of data. In Algebra I, curves of best fit are limited to linear or quadratic functions.
- The curve of best fit for the relationship among a set of data points can be used to make predictions where appropriate.
- Knowledge of transformational graphing using parent functions can be used to verify a mathematical model from a scatterplot that approximates the data.
- Graphing utilities can be used to collect, organize, represent, and generate an equation of a curve of best fit for a set of data.
- Many problems can be solved by using a mathematical model as an interpretation of a practical situation. The solution must then refer to the original practical situation.
- Data that fit linear $y = mx + b$ and quadratic $y = ax^2 + bx + c$ functions arise from practical situations.
- Rounding that occurs during intermediate steps of problem solving may reduce the accuracy of the final answer.
- Evaluation of the reasonableness of a mathematical model of a practical situation involves asking questions including:
 - “Is there another linear or quadratic curve that better fits the data?”
 - “Does the curve of best fit make sense?”
 - “Could the curve of best fit be used to make reasonable predictions?”
- Determine an equation of a curve of best fit, using a graphing utility, given a set of no more than twenty data points in a table, a graph, or a practical situation.
- Make predictions, using data, scatter plots, or the equation of the curve of best fit.
- Solve practical problems involving an equation of the curve of best fit.
- Evaluate the reasonableness of a mathematical model of a practical situation.

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Curriculum Framework
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Vocabulary	Instructional Activities Organized by Learning Objective												
Linear Regression Slope-intercept Form Quadratic Regression Line of Best Fit Curve of Best Fit Scatterplots No Correlation Positive Correlation Negative Correlation	<p>Virginia Department of Education</p> <p>Textbook Textbook <u>Virginia Glencoe, Algebra I</u>, ©2012, Carter, et al, McGraw-Hill School Education Group, page(s) 756 – 762, 785</p> <p>Eureka</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4">Eureka - (Insert Lesson Title)</th> </tr> <tr> <th>Eureka Grade</th> <th>Module</th> <th>Topic</th> <th>Lesson(s)</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Eureka - (Insert Lesson Title)				Eureka Grade	Module	Topic	Lesson(s)				
Eureka - (Insert Lesson Title)													
Eureka Grade	Module	Topic	Lesson(s)										
Assessment													
<p>RPS PowerSchool Unit Test – RPS A.9 Common Assessment Test ID#:</p> <p>Mastery Check: Curve of Best Fit Student Performance Analysis (slides 73-77)</p>	<p>Notes</p> <p>Resources</p> <ul style="list-style-type: none"> ● Print <ul style="list-style-type: none"> Coach book, <i>Virginia End-of-Course Coach</i>, © 2012, Triumph Learning, Algebra I, page(s) 198 - 223 ● Technology-based <ul style="list-style-type: none"> ○ Quizizz <ul style="list-style-type: none"> ■ Determine Curve of Best Fit ● Station Activities 												

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Curriculum Framework
Algebra 1

Cross-Curricular Connections	Tiered Differentiations
<p>Examples:</p> <ul style="list-style-type: none">• When companies agree to buy a product they look at the statistics given by the company to see if that product will fit their customer's needs.• Statistics are also used in determining the quality of a manufactured good.• All sports use statistics to determine best plays, player success rates, team success rates, etc.• Used in medicine to determine the intervals where a certain drug would be effective depending on weight and/or age of the person being treated. - Etc.	 <p>Tier 3: Recall and Reproduction Students can enter a set of data, plot the data on a coordinate grid, and approximate then check the equation for a curve of best fit.</p> <p>Tier 2: Basic Concepts and Skills</p>

Richmond Public Schools

Curriculum Framework

Algebra 1

	<p>Students can determine an equation of a curve of best fit given data points, from a table, a graph, or a practical situation.</p> <p>Tier 1: Strategic Thinking and Reasoning Students can predict the equation of the regression line before using the calculator.</p>
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