

Algebra I - Curriculum Map

Unit	Concepts Skills	Lessons	Problems
Mini-Unit: Inspirational Math Unit 1: Data/Statistics Unit 2: Ratios and Proportions Unit 3: Linear Equations	Growth Mindset	Add Headings (Format > Paragraph styles) and they will appear in your table of contents.	

***Linear Equations
and Inequalities***

Relations and

Students sketch and interpret

Problem Scenario / Ideas:

Functions, Foundations for Functions	graphs representing given situations. 1. Sketch a reasonable graph of a given relationship. 2. Interpret a graph representing a given situation 3. Find the domain and range of a relation. 4. The student gathers and records data, or uses data sets, to determine functional (systematic) relationships between quantities. 5. Students understand the concept of correlation and can describe relationships as correlated positively or negatively, and strongly or weakly.	• <u>Interpreting Distance-Time Graphs</u> (from map.mathshell.org) • Piecewise functions - I'll using calculators, building 8 different parent functions and transformations, use three parent functions to create a piecewise function each student has one quadrants to create a design, and then match it to each others to create a design. • I have a <u>whole unit</u> that uses performance tasks to explore multi-step equations and linear functions through tables, equations and graphs. It includes several inquiry-based tasks that are aligned with common core standards. • I also designed a unit on <u>scatter plots and regressions</u> (mostly linear, but introduces concepts of non-linear regressions). It includes three inquiry activities: an analysis of Olympic records, an	
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exploration of a West Nile Virus epidemic, and a fictional scenario with standards based grading rubric. This unit is also fully aligned with the Common Core.

- *Had the students blow weakened balloons and cut strips of streamers to show volume of air in the balloon over time and length of a streamer over time.*
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- [Where Would The Angry Birds Have Landed?](#)

Graphing linear equations and Inequalities	Students graph linear equations in two variables. 1. Graph a linear equation. 2. Find the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line. 3. Write the equation of a line in slope-intercept form. Understand how the slope and y-intercept of the graph are related to the equation. 4. Write the equation of a line given appropriate information. 5. Write the equation of a line that models a data set and use the equation (or the graph of the equation) to make predictions. Describe the slope of the line in terms of data, recognizing that the slope is the rate of change. 6. Graph a linear inequality	Problem Scenario / Ideas: • FirefighterMath.org: Sloped Distance. • Linear Fun:Ken Air Travel (from blog.mrmeyer.com) • Barbie and go Bungee Jumping (galspach@iserv.net) • Recreate a painting or picture using GeoGebra (this can be used for many different families of functions, not just linear). • Mathematical Hall of Fame (baseball). Have students graph a specific comparison of statistics of real baseball players (ex. Albert Pujols). Graph about 10 players as $x = \text{year experience aka year}$ 1, 2, 3, 4 vs $y = \text{particular stat}$. After finding the correlation, find the line of best fit. Then, after compiling a master list and graphing in computer software, find a parallel line that incorporates the top 510% of players statistics. Then write about who should make it into the hall	
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	<i>in two variables.</i>	<i>of fame. You can discuss many of the concepts involved.</i> • <i>Linear Functions with a Bang (from www.usingmathematically.blogspot.com)</i> • <i>Research jobs for pay, future applications, write and graph representation to compare jobs, interview an adult about their high school job (jessica.breedlove@nt.taylor.k12.in.us)</i> • <i>Proportions - Algebra 1 Football Combine - had students complete 40 yd dash, vertical leap, etc. for data used for conversions, percentage proportions, etc.</i> • <i>Writing inequalities and absolute value inequalities related to extended warranties for products prorject (from @mrschwen)--please modify instructions for students so I don't get their projects in my email :)</i>	
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Pairs of linear Equations and Inequalities, Systems of Equations and Inequalities	Students solve pairs of linear equations using algebra. 1. The student analyzes situations and formulates systems of linear equations to solve problems. 2. The student solves systems of linear equations using concrete models, graphs, tables, and algebraic methods. 3. For given contexts, the student interprets and determines the reasonableness of solutions to systems of linear equations. 4. Use a graph to find the solution set of a pair of linear inequalities.	Problem Scenario / Ideas: • • Stop sign vs. a Stop Light (Part 1) (Part 2) from emergentmath.wordpress.com • Moving On Up: modeling, linear systems; from emergentmath.wordpress.com • Students use chemical equations to graph systems of equations and find atomic mass (physical and chemical connections) • Students analyze costs and quantity of hardware materials purchased. (The Unusual Purchase) (Answer - Ch. 4 section) • Students determine the least number of objects to balance a scale given 3 others to analyze. (The Balancing Shapes) (Answer - Ch. 4 section) • Have kids bring in their change and assemble problems. Ex. Find 30 coins with nickels and pennies that add up to a certain amount. Then have	
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		<i>others make equations and build their system.</i>	
<i>Polynomials</i>	<i>Students add, subtract, multiply and divide polynomials. They factor quadratics.</i> <i>1. Add and subtract a polynomials</i> <i>2. Find powers and roots of monomials</i> <i>3. Multiply polynomials.</i> <i>4. Divide polynomials by monomials</i> <i>5. Find a common monomial factor in a polynomial.</i> <i>6. Factor the difference of two squares and other quadratics.</i>	<i>Problem Scenario / Ideas:</i> <i>• Good old-fashioned box problems. (</i> <i>• Calculating SA & V with unknown variables & linking it to optimization)</i> <i>Tie it in with product packaging & design.</i>	

Quadratic, Cubic, and Radical Equations	Students graph and solve quadratic and radical equations. They graph cubic equations. 1. Graph quadratic and radical equations. 2. Solve quadratic equations by factoring. 3. Solve quadratic equations using the quadratic formula. 4. Use quadratic equations to solve word problems 5. Solve equations that contain radical expressions. 6. Use graphing technology to	Problem Scenario / Ideas: • Cornhole - We tossed cornhole bags with specific parameters and examined characteristics of a quadratic like the max, intercepts, and zeros. How do you adjust your toss and equation to hit your target at set distance. • Same idea as above, but • with Angry Birds. • <u>Simplifying Radicals with "Go Fish"</u> (from http://www.google.com/url?q=http%3A%2F%2Frealteachingmeansrealllearning.blogspot.com%2F2011%2F11%2Fsimplifying-radicals-with-go-fish.html&sa=D&sntz=1&usg=AFQjCNFi0yedt9y74XVfVz8E5CFP-j2-bgrealteachingmeansreallearning.blogspot.com) • Radicals - had students create real life pythagorean thm. problems with simplified radical answers, literacy task with the story	
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problem

*(jessica.breedlove@nt.taylor.k12.in.us)*Where Would

The Angry Birds Have
Landed?

- *[How Tall Must the Gym Be to Make a Full Court Shot?](#) (@jstevens009)*
(page not found....)
- *[Any Way You Slice It](#) from @hungrytoteach*