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# **Algebra I Accelerated K/CC**

**Curriculum Guide**

**Scranton School District**

**Scranton, PA**



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Curriculum Guide**

**Algebra I Accelerated K/CC**

**Prerequisites:**

- A grade of 90 or higher in Common Core 7<sup>th</sup> Grade Accelerated
- Teacher recommendation from seventh grade Common Core 7<sup>th</sup> Grade Accelerated
- Students must perform in the top 1/3 of the proficient or advance scores on the PSSA.
- Students must maintain an average of 90 or above by the end of the 1<sup>st</sup> quarter to remain in the class
- Parent's consent

\*Students entering from other schools or districts, who did not take a placement test in sixth grade, must pass the Algebra Placement Test for eighth grade with a score of 90 or better.

The 8<sup>th</sup> grade Algebra I Accelerated K/CC establishes strong algebraic thinking and problem solving skills necessary for further work in mathematics. This course involves working with abstract expressions, using mathematical models to represent real-world problems, and solving open sentences. Topics presented in this course include but are not necessarily limited to:

- structure and properties of the real number system
- algebraic notation including radicals, exponents, absolute value
- varied means for analyzing and expressing patterns, relations and functions including words, tables, graphs, sequences,
- linear equations
- quadratic equations
- systems of equations and inequalities
- polynomials and operations with polynomials including factoring
- data analysis
- probability
- problem solving strategies

At the culmination of this course, the students will sit for the Keystone Algebra I Exam, a Pennsylvania graduation requirement. Successfully completing Algebra I Accelerated K/CC in eighth grade affords the students the opportunity to study Calculus in their senior year of high school. After successfully completing this course, students who meet the proper prerequisites will be enrolled in Honors Geometry or Geometry 9 in ninth grade.

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Year-at-a-glance

<b>Subject: Algebra I Accelerated K/CC</b>	<b>Grade Level: 8<sup>th</sup></b>	<b>Date Completed: 10/28/14</b>
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**1<sup>st</sup> Quarter**

<b>Topic</b>	<b>Resources</b>	<b>CCSS</b>
<b>Represent and/or use numbers in equivalent forms</b>	<b>Keystone Finish Line WB - Unit 1 Lesson 1</b>	<b>A1.1.1.1.1</b>
<b>Use Estimation strategies in problem-solving situations</b>	<b>Keystone Finish Line WB - Unit 2 Lesson 1</b>	<b>A1.1.1.4.1</b>
<b>Linear Equations</b>	<b>Big Ideas Algebra I - Chapter 1</b> <b>Keystone Unit 3 Lesson 1</b>	<b>A1.1.2.1.2</b>
<b>Linear Inequalities</b>	<b>Big Ideas Algebra I - Chapter 2</b> <b>Keystone Unit 4 Lesson 1</b>	<b>A1.1.3.1.3, A1.1.3.1.2, A1.1.3.1.1</b>
<b>Functions</b>	<b>Big Ideas Algebra I - Chapter 3.1- 3.5</b> <b>Keystone WB - Unit 5 Lesson 2</b>	<b>A1.2.1.1.3,A1.2.1.1.2, A1.2.2.1.1</b>
<b>Rate of Change</b>	<b>Big Ideas Algebra I - Chapter 3.2-3.5</b>	<b>A1.2.2.1.1, A1.2.2.1.2</b>

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**2<sup>nd</sup> Quarter**

<b>Topic</b>	<b>Resources</b>	<b>CCSS</b>
<b>Linear Equations with two variables</b>	<b>Big Ideas Algebra I - Chapter 4.1-4.4</b>	<b>A1.2.2.1.3, A1.2.2.1.4, A1.1.2.1.3, A1.2.1.2.1, A1.2.1.2.2 A1.2.2.2.1,</b>
<b>Systems of Linear Equations</b>	<b>Big Ideas Algebra I - Chapter 5.1-5.4</b>	<b>A1.1.2.2.1</b>
<b>Interpret solutions to Linear Systems.</b>	<b>Big Ideas Algebra I - Chapter 5.1-5.4</b> <b>Keystone Finish Line WB - Unit 3 Lesson 3</b>	<b>A1.1.2.2.2</b>
<b>Systems of Linear Inequalities</b>	<b>Big Ideas Algebra I - Chapter 5.6-5.7</b>	<b>A1.1.3.2.1</b>
<b>Interpret solutions to Linear Inequalities</b>	<b>Big Ideas Algebra I - Chapter 5.6-5.7</b> <b>Keystone Finish Line WB - Unit 4 Lesson 3</b>	<b>A1.1.3.2.2</b>
<b>Transformations Angles and Triangles</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) - Chapters 2 and 3</b>	<b>8.A.2</b>
<b>Volume and Similar Solids</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) – Chapter 8.1 – 8.3</b>	<b>8.A.1</b>
<b>Pythagorean Theorem</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) - Chapter 7</b>	<b>8.A.3</b>

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**3<sup>rd</sup> Quarter**

Topic	Resources	CCSS
Exponents, Roots and Absolute Value	Big Ideas Algebra I - Chapter 6.1 Keystone Finish Line WB - Unit 1 Lesson 4	A1.1.1.3.1, A1.1.1.1.2
Simplify expressions involving polynomials	Big Ideas Algebra I - Chapter 7.1-7.3 Keystone Finish Line WB - Unit 2 Lesson 2	A1.1.1.5.1
GCF and LCM for monomials	Keystone Finish Line WB - Unit 1 Lesson 3	A1.1.1.2.1
Simplify expressions involving polynomials	Big Ideas Algebra I - Chapter 7.4-7.8 Keystone Finish Line WB - Unit 2 Lesson 3 &4 Keystone Finish Line WB - Unit 2 Lesson 5 <u>**Login to site – <a href="http://bigideasmath.com">bigideasmath.com</a> -Common Core 2014 – Purple Infinity Algebra Book Chapter 11, Section 3</u>	A1.1.1.5.2, A1.1.1.5.3

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**4<sup>th</sup> Quarter**

<b>Topic</b>	<b>Resources</b>	<b>CCSS</b>
<b>Use measures of dispersion to describe a set of data</b>	<b>Keystone Finish Line WB – Unit 7 Sections 1-4 *Big Ideas Algebra I - Chapter 11 See standards</b>	<b>A1.2.3.1.1</b>
<b>Use data displays in the problem-solving settings and/or to make predictions</b>	<b>Keystone Finish Line WB – Unit 7 Sections 1-4 *Big Ideas Algebra I - Chapter 11 See standards</b>	<b>A1.2.3.2.1, A1.2.3.2.2, A1.2.3.2.3</b>
<b>Apply Probability to practical situations</b>	<b>Keystone Finish Line WB – Unit 7 Lesson 5</b>	<b>A1.2.3.3.1</b>
<b>Final Review</b>		

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**\*The suggested timeline and curriculum content should be adjusted and revised as needed in correlation with the PA State Standards.**

<b>General Topic</b>	<b>Academic Standard(s)</b>	<b>Essential Knowledge, Skills &amp; Vocabulary</b>	<b>Resources &amp; Activities</b>	<b>Assessments</b>	<b>Suggested Time</b>
<b>Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).</b>	<b>A1.1.1.1.1</b>	<b>Compare and/or order any real numbers. Rational and irrational may be mixed.</b>	<b>Keystone Finish Line WB - Unit 1 Lesson1</b>	<b>Teacher prepared tests, quizzes, etc.</b>  <b>Series available assessments online. (Optional)</b>	<b>1 day</b>
<b>Use Estimation strategies in problem-solving situations</b>	<b>A1.1.1.4.1</b>	<b>Use estimation to solve problems</b>	<b>Keystone Finish Line WB - Unit 2 Lesson 1</b>  <b>*Use throughout when appropriate</b>		<b>1 day</b>

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Linear equations	A1.1.2.1.2	<p>Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only</p> <p>Vocabulary:</p> <ul style="list-style-type: none"> <li>• Additive inverse</li> <li>• Multiplicative Inverse</li> <li>• Commutative property</li> <li>• Associative Property</li> <li>• Identity Property</li> <li>• Distributive Property</li> <li>• Multiplicative Property of Zero</li> <li>• Additive Property of Equality</li> <li>• Multiplicative Property of Equality</li> </ul>	<p>Big Ideas Algebra I – Chapter 1</p> <p>Keystone Finish Line WB - Unit 3 Lesson 1</p> <p>Engage NY Module 4 Topic A Lessons 1-9 <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a></p>		12 days
	A1.1.2.1.1	Write, solve, and/or apply a linear equation (including problem situations).	<p>Occurs in every chapter</p> <p>*Used throughout</p>		



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<b>Linear Inequalities</b>	<b>A1.1.3.1.2</b>	<b>Identify or graph the solution set to a linear inequality on a number line.</b>	<b>Big Ideas Algebra I – Chapter 2</b>  <b>Keystone Finish Line WB - Unit 4 Lesson 1</b>		<b>10 days</b>
	<b>A1.1.3.1.3</b>	<b>Interpret solutions to the problems in the context of the problem situations. Note: Linear inequalities only.</b>	<b>Big Ideas Algebra I – Chapter 2</b>  <b>Keystone Finish Line WB - Unit 4 Lesson 1</b>		
	<b>A1.1.3.1.1</b>	<b>Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value Inequalities).</b>	<b>Big Ideas Algebra I – Chapter 2</b>  <b>Keystone Finish Line WB - Unit 4 Lesson 2</b>		
<b>Functions</b>	<b>A1.2.1.1.3</b>	<b>Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table). Vocabulary:</b> <ul style="list-style-type: none"> <li>• Range</li> <li>• Domain</li> </ul>	<b>Big Ideas Algebra I – Chapter 3.1</b>  <b>Keystone Finish Line WB - Unit 5 Lesson 2</b>  <b>Engage NY</b> Module 4 Topic A Lessons 1-9 <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		<b>21 days</b>

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	<b>A1.2.1.1.2</b>	<b>Determine whether a relation is a function, given a set of points or a graph.</b>	<b>Big Ideas Algebra I – Chapter 3.1</b>  <b>Keystone Finish Line WB - Unit 5 Lesson 2</b>  <b>Engage NY</b> Module 4 Topic A Lessons 1-9 <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		
	<b>A1.2.1.1.1</b>	<b>Analyze a set of data for the existence of a pattern and represent the pattern Algebraically and/or graphically.</b>	<b>Big Ideas Algebra I – Chapter 3.2-3.5</b>  <b>Engage NY</b> <b>Module 4 Topic B 10-14</b> <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		
<b>Rate of Change</b>	<b>A1.2.2.1.1</b>	<b>Identify, describe, and/or use constant rates of change.</b>	<b>Big Ideas Algebra I – Chapter 3.2-3.5</b>  <b>Engage NY</b> <a href="https://www.engageny.org/resource/grade-8-mathematics-module-4-topic-b-lesson-11">https://www.engageny.org/resource/grade-8-mathematics-module-4-topic-b-lesson-11</a>		

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	<b>A1.2.2.1.2</b>	<b>Apply the concept of linear rate of change (slope) to solve problems.</b>	<b>Big Ideas Algebra I – Chapter 3.3-3.5</b>  Engage NY Module 4 Topic C Lesson 15-17 <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		
<b>Linear Equations with two variables</b>	<b>A1.2.2.1.3</b>	<b>Write or identify a linear equation when given</b> <ul style="list-style-type: none"> <li>• The graph of the line,</li> <li>• Two points on the line, or</li> <li>• The slope and a point on the line.</li> <li>• Parallel and Perpendicular Lines</li> </ul> <b>Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.</b>	<b>Big Ideas Algebra I – Chapter 4.1-4.3</b>  Engage NY Module 4 Topic C Lesson 18-23 <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		<b>19 days</b>
	<b>A1.2.2.1.4</b>	<b>Determine the slope and/or y-intercept represented by a linear equation or graph.</b>	<b>Big Ideas Algebra I – Chapter 4.1</b>		
	<b>A1.1.2.1.3</b>	<b>Interpret solutions to problems in the context of the problem situation.</b> <b>Note: Linear equations only.</b>	<b>Big Ideas Algebra I – Chapter 4.1-4.3</b>  *Used throughout		

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	<b>A1.2.1.2.1</b>	<b>Create, interpret, and/or use the equation, graph, or table of a linear function.</b>	<b>Big Ideas Algebra I – Chapter 4.1-4.3</b>  <b>*Used throughout</b>		
	<b>A1.2.1.2.2</b>	<b>Translate from one representation of a linear function to another (i.e., graph, table, and equation).</b>	<b>Big Ideas Algebra I – Chapter 4.1-4.3</b>  <b>*Used throughout</b>  <b>Engage NY</b> <b>Module 6 Topic A Lesson 1-5</b> <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		
	<b>A1.2.2.2.1</b>	<b>Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot</b>	<b>Big Ideas Algebra I – Chapter 4.4</b>  <b>Engage NY</b> <b>Module 6 Topic B &amp; C Lesson 6-9</b> <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		

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<b>Systems of Linear Equations</b>	<b>A1.1.2.2.1</b>	<b>Write and/or solve a system of linear equations, including problem, using graphing, substitution, and/or elimination.</b>	<b>Big Ideas Algebra I – Chapter 5.1-5.4</b>  <b>Engage NY</b> <b>Module 4 Topic D Lesson 24-30</b> <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		<b>19 days</b>
<b>Interpret solutions to Linear Systems.</b>	<b>A1.1.2.2.2</b>	<b>Interpret solutions to problems in the context of the problem situation. Limit systems to two linear equations</b>	<b>Big Ideas Algebra I – Chapter 5.1-5.4</b>  <b>Keystone Finish Line WB - Unit 3 Lesson 3</b>		
<b>Systems of Linear Inequalities</b>	<b>A1.1.3.2.1</b>	<b>Write and/or solve a system of Linear Inequalities using graphing. Limit to two linear inequalities.</b>	<b>Big Ideas Algebra I – Chapter 5.6-5.7</b>		
<b>Interpret solutions to Linear Inequalities</b>	<b>A1.1.3.2.2</b>	<b>Interpret solutions to problems in the context of the problem situation. Limit systems to two linear inequalities</b>	<b>Big Ideas Algebra I – Chapter 5.6-5.7</b>  <b>Keystone Finish Line WB - Unit 4 Lesson 3</b>		
<b>Transformations Angles and Triangles</b>	<b>CC.2.3.8.A.2</b>	<b>Understand and apply congruence, similarity, and geometric transformations using various tools.</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) - Chapters 2 and 3</b>		<b>3 days</b>

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<b>Volume and Similar Solids</b>	<b>CC.2.3.A.1</b>	<b>Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems.</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) - Chapter 8.1 – 8.3</b>		<b>2 days</b>
<b>Pythagorean Theorem</b>	<b>CC.2.3.8.A.3</b>	<b>Understand and apply the Pythagorean Theorem to solve problems.</b>	<b>Big Ideas Blue (8<sup>th</sup> grade) - Chapter 7</b>  <b>Engage NY</b> <b>Module 2 Topic D Lessons 15 &amp;16</b> <a href="https://www.engageny.org/resource/grade-8-mathematics">https://www.engageny.org/resource/grade-8-mathematics</a>		<b>2 days</b>
<b>Exponents, Roots and Absolute Value</b>	<b>A1.1.1.3.1</b>	<b>Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems.</b>	<b>Big Ideas Algebra I – Chapter 6.1</b>  <b>Keystone Finish Line WB - Unit 1 Lesson 4</b>  <b>Engage NY Module 1 Topic A Lessons 1-6</b> <a href="https://www.engageny.org/resource/grade-8-mathematics-module-1-topic-lesson-1">https://www.engageny.org/resource/grade-8-mathematics-module-1-topic-lesson-1</a>		<b>10 days</b>
	<b>A1.1.1.1.2</b>	<b>Simplify Square Roots (e.g., <math>\sqrt{24} = 2\sqrt{6}</math>)</b>	<b>Keystone Finish Line WB - Unit 1 Lesson 2</b>  <b>*Supplement resources will be needed</b>		<b>10 days</b>

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Simplify expressions involving polynomials	A1.1.1.5.1	Add, subtract, and/or multiply polynomial expressions (express answer in simplest form) Nothing larger than a binomial multiplied by a trinomial.	Big Ideas Algebra I – Chapter 7.1-7.3  Keystone Finish Line WB - Unit 2 Lesson 2		10 days
GCF and LCM for monomials	A1.1.1.2.1	Find the Greatest Common Factor and/or Least Common Multiple for sets of monomials	Keystone Finish Line WB - Unit 1 Lesson 3  *Supplement resources will be needed		5 days
Simplify expressions involving polynomials	A1.1.1.52	Factor Algebraic expressions, including difference of two squares and trinomials. Trinomials limited to the form $ax^2 + bx + c$ , where a is equal to 1 after factoring out all monomials factors.	Big Ideas Algebra I – Chapter 7.4-7.8  Keystone Finish Line WB - Unit 2 Lesson 3 &4		15 days
	A1.1.1.5.3	Simplify/reduce a rational algebraic expression.	Keystone Finish Line WB - Unit 2 Lesson 5  <u>**Login to site – Common Core 2014 – Purple infinity Algebra Book Chapter 11, Section 3</u>		

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Use measures of dispersion to describe a set of data	A1.2.3.1.1	Calculate and/or interpret the range, quartiles, and interquartile range of data	Keystone Finish Line WB - Unit 7 Sections 1-4  *Big Ideas Algebra I - Chapter 11		10 days
Use data displays in the problem-solving settings and/or to make predictions	A1.2.3.2.1	Estimate or calculate to make predictions based on a circle, line, bar graph, measure of central tendency, or other representation.	Keystone Finish Line WB - Unit 7 Sections 1-4  *Big Ideas Algebra I - Chapter 11 See standards		
	A1.2.3.2.2	Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measure of central tendency, or other representations)	Keystone Finish Line WB - Unit 7 Sections 1-4  *Big Ideas Algebra I - Chapter 11 See standards		
	A1.2.3.2.3	Make predictions using the equations or graphs of best-fit lines of scatter plots	Keystone Finish Line WB - Unit 7 Sections 1-4  *Big Ideas Algebra I - Chapter 11 See standards		
Apply Probability to practical situations	A1.2.3.3.1	Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal or percent.	Keystone Finish Line WB - Unit 7 Lesson 5		



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<b>Keystone Review and Exam</b>					<b>10 days</b>
<b>Selected Topics</b>		<ul style="list-style-type: none"> <li>• Solving quadratic equations</li> <li>• Completing the square</li> <li>• Solving the quadratic formula</li> <li>• Graphing quadratics with tables of values</li> <li>• Solving radical equations</li> </ul>	<b>Big Ideas Algebra I – Chapters 9 and 10</b>		<b>10 days</b>
<b>Final Review/Final Exam</b>					<b>10 days</b>