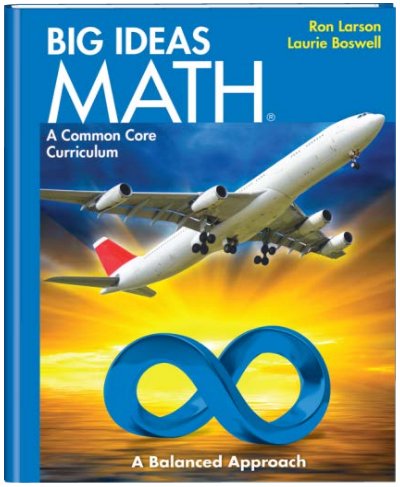

Big Ideas Math (Blue)
Correlation to the Common Core State Standards
Regular Pathway - Grade 8

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Correlated to
Common Core State Standards for Mathematics Grade 8

Standard		Pages or Locations Where Standard is Addressed
Domain: The Number System		
8.NS.1	Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.	*Primary SE/TE:* 308-315 (7.4), 316-317 (Ext. 7.4)
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).	*Primary SE/TE:* 308-315 (7.4)
Domain: Expressions and Equations		
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.	*Primary SE/TE:* 410-415 (10.1), 416-421 (10.2), 422-427 (10.3), 428-433 (10.4)
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form *x^2* = *p* and *x^3* = *p*, where *p* is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	*Primary SE/TE:* 288-293 (7.1), 294-299 (7.2), 300-305 (7.3), 318-323 (7.5) *Supporting SE/TE:* 308-315 (7.4)
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	*Primary SE/TE:* 436-441 (10.5), 442-447 (10.6), 448-453 (10.7)
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	*Primary SE/TE:* 436-441 (10.5), 442-447 (10.6), 448-453 (10.7)
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	*Primary SE/TE:* 158-163 (4.3) *Supporting SE/TE:* 142-147 (4.1)
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	*Primary SE/TE:* 148-155 (4.2), 158-163 (4.3), 166-171 (4.4) *Supporting SE/TE:* 156-157 (Ext. 4.2), 172-177 (4.5)

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Standard		Pages or Locations Where Standard is Addressed
8.EE.7	Solve linear equations in one variable.	
	a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).	*Primary SE/TE:* 2-9 (1.1), 10-15 (1.2), 18-25 (1.3) *Supporting SE/TE:* 26-31 (1.4), 230-231 (Ext. 5.4)
	b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	*Primary SE/TE:* 2-9 (1.1), 10-15 (1.2), 18-25 (1.3) *Supporting SE/TE:* 26-31 (1.4), 201, 230-231 (Ext. 5.4)
8.EE.8	Analyze and solve pairs of simultaneous linear equations.	
	a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	*Primary SE/TE:* 202-207 (5.1), 224-229 (5.4) *Supporting SE/TE:* 230-231 (Ext. 5.4)
	b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.	*Primary SE/TE:* 202-207 (5.1), 208-213 (5.2), 216-223 (5.3), 224-229 (5.4) *Supporting SE/TE:* 230-231 (Ext. 5.4)
	c. Solve real-world and mathematical problems leading to two linear equations in two variables.	*Primary SE/TE:* 202-207 (5.1), 208-213 (5.2), 216-223 (5.3), 224-229 (5.4) *Supporting SE/TE:* 230-231 (Ext. 5.4)
Domain: Functions		
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	*Primary SE/TE:* 242-247 (6.1), 248-255 (6.2)
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	*Primary SE/TE:* 256-263 (6.3)
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.	*Primary SE/TE:* 256-263 (6.3), 266-271 (6.4)
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	*Primary SE/TE:* 256-263 (6.3) *Supporting SE/TE:* 178-183 (4.6), 184-189 (4.7), 371

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Standard		Pages or Locations Where Standard is Addressed
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	*Primary SE/TE:* 272-277 (6.5)
Domain: Geometry		
8.G.1	Verify experimentally the properties of rotations, reflections, and translations:	
	a. Lines are taken to lines, and line segments to line segments of the same length.	*Primary SE/TE:* 48-53 (2.2), 54-59 (2.3), 60-67 (2.4)
	b. Angles are taken to angles of the same measure.	*Primary SE/TE:* 48-53 (2.2), 54-59 (2.3), 60-67 (2.4)
	c. Parallel lines are taken to parallel lines.	*Primary SE/TE:* 48-53 (2.2), 54-59 (2.3), 60-67 (2.4)
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	*Primary SE/TE:* 48-53 (2.2), 54-59 (2.3), 60-67 (2.4) *Supporting SE/TE:* 42-47 (2.1)
8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	*Primary SE/TE:* 48-53 (2.2), 54-59 (2.3), 60-67 (2.4), 82-89 (2.7)
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	*Primary SE/TE:* 82-89 (2.7) *Supporting SE/TE:* 70-75 (2.5), 76-81 (2.6)
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	*Primary SE/TE:* 102-109 (3.1), 110-115 (3.2), 126-131 (3.4) *Supporting SE/TE:* 118-125 (3.3)
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	*Primary SE/TE:* 300-305 (7.3), 318-323 (7.5)
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	*Primary SE/TE:* 300-305 (7.3), 318-323 (7.5)
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	*Primary SE/TE:* 300-305 (7.3), 318-323 (7.5)
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	*Primary SE/TE:* 334-339 (8.1), 340-345 (8.2), 348-353 (8.3) *Supporting SE/TE:* 354-361 (8.4)
Domain: Statistics and Probability		
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	*Primary SE/TE:* 372-377 (9.1), 378-383 (9.2) *Supporting SE/TE:* 392-399 (9.4)

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Standard		Pages or Locations Where Standard is Addressed
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	*Primary SE/TE:* 378-383 (9.2)
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	*Primary SE/TE:* 378-383 (9.2)
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	*Primary SE/TE:* 386-391 (9.3)

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	Standard	Pages or Locations Where Standard is Addressed
Mathematical Practices		
		Big Ideas Math is a research-based program, systematically developed using the Common Core State Standards for Mathematical Practice as the underlying structure. The Standards for Mathematical Practice are seamlessly connected to the Common Core State Content Standards resulting in a program that maximizes both teacher effectiveness and student understanding. Every section has additional Mathematical Practice support in the Dynamic Classroom and in the online Lesson Plans at *BigIdeasMath.com* .
1	Make sense of problems and persevere in solving them. Mathematically proficient students: • Explain to themselves the meaning of a problem and looking for entry points to its solution. • Analyze givens, constraints, relationships, and goals • Make conjectures about the form and meaning of the solution attempt. • Plan a solution pathway rather than simply jumping into a solution. • Consider analogous problems and try special cases and simpler forms of the original problen in order to gain insight into its solution. • Monitor and evaluate their progress and change course if necessary. • Transform algebraic expressions or change the viewing window on their graphing calculator to get information. • Explain correspondences between equations, verbal descriptions, tables, and graphs. • Draw diagrams of important features and relationships, graph data, and search for regularity or trends. • Use concrete objects or pictures to help conceptualize and solve a problem. • Check their answers to problems using a different method. • Ask themselves, "Does this make sense?" • Understand the approaches of others to solving complex problems and identify correspondences between approaches.	Each section begins with an Essential Question. Students look for entry points using guides such as In Your Own Words. Clear step-by-step examples encourage students to plan a solution pathway rather than jumping into a solution attempt. Guided questions and instructional scaffolding support students' perseverance. ***Sample references:*** Chapter 1, pages 10-15 Chapter 2, pages 76-81 Chapter 4, pages 148-155 Chapter 4, pages 178-183 Chapter 5, pages 208-213 Chapter 5, pages 216-223 Chapter 6, pages 272-277 Chapter 8, pages 334-339 Chapter 10, pages 410-415

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	Standard	Pages or Locations Where Standard is Addressed
2	Reason abstractly and quantitively. Mathematically proficient students: • Make sense of quantities and their relationships in problem situations. • Bring two complementary abilities to bear on problems involving quantitative relationships: - Decontextualize (abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents) and - Contextualize (pause as needed during the manipulation process in order to probe into the referents for the symbols involved) • Use quantitative reasoning that entails creating a coherent representation of the problem at hand, considering the units involved, and attending to the meaning of quantities, not just how to compute them . • Know and flexibly use different properties of operations and objects.	Students learn to represent problems by consistently using a verbal model, paying close attention to units and employing mathematical properties. This helps students represent problems symbolically and manipulate the representative symbols. They are taught to contextualize by thinking about the referents and symbols involved. ***Sample references:*** Chapter 1, pages 18-25 Chapter 3, pages 126-131 Chapter 4, pages 172-177 Chapter 8, pages 340-345 Chapter 10, pages 428-433

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Standard		Pages or Locations Where Standard is Addressed
3	Construct viable arguments and critique the reasoning of others. Mathematically proficient students: • Understand and use stated assumptions, definitions, and previously established results in constructing arguments. • Make conjectures and build a logical progression of statements to explore the truth of their conjectures. • Analyze situations by breaking them into cases. • Recognize and use counterexamples. • Justify their conclusions, communicate them to others, and respond to the arguments of others. • Reason inductively about data, making plausible arguments that take into account the context from which the data arose. • Compare the effectiveness of two plausible arguments. • Distinguish correct logic or reasoning from that which is flawed and, if there is a flaw, explain what it is - Elementary students construct arguments using concrete referents such as objects, drawings, diagrams, and actions. - Later students learn to determine domains to which an argument applies. • Listen or read the arguments of others, decide whether they make sense, and ask useful question to clarify or improve arguments.	Throughout the series students are expected to develop models, formulate deductions, and make conjectures. Essential Questions, Error Analysis exercises, and Reasoning exercises provide opportunities for students to make assumptions, examine results, and explain their reasoning. What Is Your Answer, In Your Own Words, You Be The Teacher, and Which One Doesn't Belong encourage debate and sensemaking. ***Sample references:*** Chapter 1, pages 2-9 Chapter 2, pages 48-53 Chapter 3, pages 82-89 Chapter 3, pages 118-125 Chapter 4, pages 166-171 Chapter 4, pages 184-189 Chapter 6, pages 248-255 Chapter 7, pages 300-305 Chapter 9, pages 386-391 Chapter 10, pages 448-453

Standard		Pages or Locations Where Standard is Addressed
4	Model with mathematics. Mathematically proficient students: • Apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. - In early grades, this might be as simple as writing an addition equation to describe a situation. - In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. - By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. • Make assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. • Identify important quantities in a practical situation • Map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. • Analyze those relationships mathematically to draw conclusions. • Interpret their mathematical results in the context of the situation. • Reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	In each section, students work with the mathematics of everyday life. Students use graphs, tables, charts, number lines, diagrams, flowcharts, and formulas to organize, make sense of, and identify realistic solutions to real-life situations. Students write stories involving math, on topics such as using percents to help them improve their grades. Visual representations, such as integer tiles and fraction models, help students make sense of numeric operations. ***Sample references:*** Chapter 2, pages 70-75 Chapter 5, pages 224-229 Chapter 6, pages 266-271 Chapter 8, pages 348-353 Chapter 9, pages 378-383 Chapter 9, pages 392-399 Chapter 10, pages 436-441

Standard		Pages or Locations Where Standard is Addressed
5	Use appropriate tools strategically. Mathematically proficient students: • Consider available tools when solving a mathematical problem. (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software) • Are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. • Detect possible errors by strategically using estimation and other mathematical knowledge. • Know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. • Identify relevant external mathematical resources and use them to pose or solve problems. • Use technological tools to explore and deepen their understanding of concepts.	Opportunities for students to select and use appropriate tools such as graphing calculators, protractors, measuring devices, websites, and other external resources are provided for students throughout the series. ***Sample references:*** Chapter 2, pages 42-47 Chapter 4, pages 142-147 Chapter 5, pages 202-207 Chapter 7, pages 308-315 Chapter 9, pages 372-377
6	Attend to Precision. Mathematically proficient students: • Try to communicate precisely to others. - In the elementary grades, students give carefully formulated explanations to each other. - In high school, students have learned to examine claims and make explicit use of definitions. • Try to use clear definitions in discussion with others and in their own reasoning. • State the meaning of the symbols they choose, including using the equal sign consistently and appropriately. • Specify units of measure and label axes to clarify the correspondence with quantities in a problem. • Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context.	Through the balanced approach to instruction, students have daily opportunities to communicate mathematically. Students work through activities, examples, and exercises to understand and use the language of mathematics, paying careful attention to the importance of units, labeling, and quantities. ***Sample references:*** Chapter 2, pages 60-67 Chapter 3, pages 102-109 Chapter 6, pages 256-263 Chapter 7, pages 288-293 Chapter 7, pages 318-323 Chapter 10, pages 442-447

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7	Look for and make use of structure. Mathematically proficient students: • Look closely to discern a pattern or structure. - Young students might notice that three and seven more is the same amount as seven and three more or they may sort a collection of shapes according to how many sides the shapes have. - Later, students will see 7 x 8 equals the well remembered 7 x 5 + 7 x 3, in preparation for the distributive property. - In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 x 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. • Step back for an overview and can shift perspective. • See complicated things, such as some algebraic expressions, as single objects or composed of several objects.	Real and relevant word problems encourage students to “see” that these problems are composed of several components. Students find that some mathematical representations share common mathematical structures and learn to look for these relationships discerning inherent patterns and structures. ***Sample references:*** Chapter 2, pages 54-59 Chapter 4, pages 158-163 Chapter 6, pages 242-247 Chapter 7, pages 294-299 Chapter 10, pages 416-421
8	Look for and express regularity in repeated reasoning. Mathematically proficient students: • Notice if calculations are repeated. • Look both for general methods and for shortcuts. - Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeated decimal. - Paying attention to the calculation of slope as they repeatedly check whether the points are on the line through (1,2) with a slope 3, middle school students might abstract the equation (y-2)/(x-1)=3. - Noticing the regularity in the way terms cancel when expanding (x-1)(x+1), $(x-1)(x^2+x+1)$, and $(x-1)(x^3+x^2+x+1)$ might lead high school students to the general formula for the sum of a geometric series. • Maintain oversight of the process of solving a problem, while attending to the details. • Continually evaluate the reasonableness of intermediate results.	The series helps students see that mathematics is well structured and predictable. Students work through a problem, not through the numbers. They consider factors such as an appropriate answer to the question, reasonable intermediate steps, and a realistic solution. ***Sample references:*** Chapter 1, pages 26-31 Chapter 3, pages 110-115 Chapter 8, pages 354-361 Chapter 10, pages 422-427