Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
Conceptual Category: Number and Quantity		
Domain: The Real Number System		
N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define* $5^{1/3}$ *to be the cube root of 5 because we want* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	*Primary SE/TE* : 299-304 (6.2)
N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	*Primary SE/TE* : 291-298 (6.1), 299-304 (6.2), 479-488 (9.1) *Supporting SE/TE* : 559-566 (10.3)
N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	*Primary SE/TE* : 479-488 (9.1)
Domain: Quantities		
N.Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	*Primary SE/TE* : 15 (1.2) *Supporting SE/TE* : 37 (1.5), 129, 132-134 (3.4)
N.Q.2	Define appropriate quantities for the purpose of descriptive modeling.	*Supporting SE/TE:* 124 (3.3), 178 (4.1), 238 (5.1), 244 (5.2), 250 (5.3), 264 (5.5), 335 (6.6), 400 (7.7), 428 (8.2), 435 (8.3), 464 (8.6), 493 (9.2), 509 (9.4), 517 (9.5), 554 (10.2), 563 (10.3)
N.Q.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	*Supporting SE/TE:* 204, 207, 208 (4.5), 299 (6.2), 313, 314, 316, 318, 321 (6.4), 463 (8.6), 497 (9.3), 546 (10.1), 554 (10.2)
Conceptual Category: Algebra		
Domain: Seeing Structure in Expressions		
A.SSE.1	Interpret expressions that represent a quantity in terms of its context.	
	a. Interpret parts of an expression, such as terms, factors, and coefficients.	*Supporting SE/TE* : 112, 113, 115, 118, 119 (3.2), 122, 124-126 (3.3), 135, 138-144 (3.5), 359, 361-364 (7.1)
	b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1+r)^n$ *as the product of P and a factor not depending on P.*	*Supporting SE/TE* : 13, 16-18 (1.2), 313-322 (6.4), 377-382 (7.4)
A.SSE.2	Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$*, thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$*.*	*Primary SE/TE* : 385-390 (7.5), 391-396 (7.6), 397-402 (7.7), 403-408 (7.8)
A.SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	
	a. Factor a quadratic expression to reveal the zeros of the function it defines.	*Primary SE/TE* : 388, 390 (7.5), 394, 396 (7.6), 400, 402 (7.7), 406-408 (7.8), 449-458 (8.5)
	b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	*Primary SE/TE* : 508, 509, 511-514 (9.4)

Items in brackets are not required until Algebra 2.

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
	c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression* 1.15^t *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	*Primary SE/TE* : 316, 320, 322 (6.4)
Domain: Arithmetic with Polynomials and Rational Expressions		
A.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	*Primary SE/TE* : 357-364 (7.1), 365-370 (7.2), 371-376 (7.3)
A.APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	*Primary SE/TE* : 377-382 (7.4), 449-458 (8.5) *Supporting SE/TE* : 385-390 (7.5), 391-396 (7.6), 397-402 (7.7), 403-408 (7.8), 489-496 (9.2)
Domain: Creating Equations		
A.CED.1	Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	*Primary SE/TE* : 3-10 (1.1), 11-18 (1.2), 19-24 (1.3), 27-34 (1.4), 53-60 (2.1), 61-66 (2.2), 67-72 (2.3), 73-78 (2.4), 81-86 (2.5), 87-92 (2.6), 325-330 (6.5), 497-502 (9.3), 505-514 (9.4), 515-524 (9.5), 559-566 (10.3) *Supporting SE/TE* : 385-390 (7.5), 391-396 (7.6), 397-402 (7.7), 403-408 (7.8), 525-532 (9.6)
A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	*Primary SE/TE* : 111-120 (3.2), 121-126 (3.3), 129-134 (3.4), 135-144 (3.5), 155-162 (3.7), 175-180 (4.1), 181-186 (4.2), 187-192 (4.3), 217-224 (4.7), 305-312 (6.3), 313-322 (6.4), 419-424 (8.1), 425-430 (8.2), 431-438 (8.3), 441-448 (8.4), 449-458 (8.5), 543-550 (10.1), 551-556 (10.2) *Supporting SE/TE* : 235-240 (5.1), 241-246 (5.2), 247-252 (5.3), 253-258 (5.4), 459-468 (8.6), 567-574 (10.4)
A.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	*Primary SE/TE* : 235-240 (5.1), 241-246 (5.2), 247-252 (5.3), 253-258 (5.4), 261-266 (5.5), 267-272 (5.6), 273-280 (5.7)
A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*	*Primary SE/TE* : 35-42 (1.5), 497-502 (9.3)
Domain: Reasoning with Equations and Inequalities		
A.REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	*Primary SE/TE* : 3-10 (1.1), 325-330 (6.5) *Supporting SE/TE* : 11-18 (1.2), 19-24 (1.3), 27-34 (1.4), 497-502 (9.3), 505-514 (9.4), 515-524 (9.5), 559-566 (10.3)
A.REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	*Primary SE/TE* : 3-10 (1.1), 11-18 (1.2), 19-24 (1.3), 27-34 (1.4), 61-66 (2.2), 67-72 (2.3), 73-78 (2.4), 81-86 (2.5), 87-92 (2.6)

Items in brackets are not required until Algebra 2.

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
A.REI.4	Solve quadratic equations in one variable.	
	a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	*Primary SE/TE* : 505-514 (9.4), 515-524 (9.5)
	b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	*Primary SE/TE* : 377-382 (7.4), 497-502 (9.3), 505-514 (9.4), 515-524 (9.5) *Supporting SE/TE* : 388-390 (7.5), 394-396 (7.6), 399-402 (7.7), 405-408 (7.8)
A.REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	*Primary SE/TE* : 247-252 (5.3)
A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	*Primary SE/TE* : 235-240 (5.1), 241-246 (5.2), 247-252 (5.3), 253-258 (5.4)
A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	*Primary SE/TE* : 525-532 (9.6)
A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	*Primary SE/TE* : 111-120 (3.2), 155-162 (3.7), 217-224 (4.7) *Supporting SE/TE* : 305-312 (6.3), 419-424 (8.1), 431-438 (8.3), 543-550 (10.1), 551-556 (10.2)
A.REI.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*	*Primary SE/TE* : 261-266 (5.5), 325, 328-330 (6.5), 491, 494-496 (9.2), 527-532 (9.6) *Supporting SE/TE* : 464 (8.6), 561, 564-566 (10.3)
A.REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	*Primary SE/TE* : 267-272 (5.6), 273-280 (5.7)
Conceptual Category: Functions		
Domain: Interpreting Functions		
F.IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	*Primary SE/TE* : 103-110 (3.1), 121-126 (3.3)
F.IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	*Primary SE/TE* : 121-126 (3.3)
F.IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ *for* $n \geq 1$.	*Primary SE/TE* : 209-216 (4.6), 331-338 (6.6), 339-346 (6.7)

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
F.IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**	*Primary SE/TE* : 135-144 (3.5), 305-312 (6.3), 441-448 (8.4), 449-458 (8.5), 543-550 (10.1), 551-556 (10.2) *Supporting SE/TE* : 121-126 (3.3), 489-496 (9.2)
F.IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.**	*Primary SE/TE* : 111-120 (3.2) *Supporting SE/TE* : 132-134 (3.4)
F.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*	*Primary SE/TE* : 462-468 (8.6), 546, 547, 549, 550 (10.1), 554, 556 (10.2) *Supporting SE/TE* : 316, 320 (6.4)
F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	
	a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	*Primary SE/TE* : 111-120 (3.2), 121-126 (3.3), 129-134 (3.4), 135-144 (3.5), 145-154 (3.6), 419-424 (8.1), 425-430 (8.2), 431-438 (8.3), 489-496 (9.2)
	b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	*Primary SE/TE* : 155-162 (3.7), 217-224 (4.7), 543-550 (10.1), 551-556 (10.2)
	e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	*Primary SE/TE* : 305-312 (6.3), 317, 318, 321 (6.4)
F.IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	
	a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	*Primary SE/TE* : 449-458 (8.5), 505-514 (9.4)
	b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.	*Primary SE/TE* : 316, 318, 320-322 (6.4)
F.IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	*Primary SE/TE* : 124, 126 (3.3), 305-312 (6.3), 435, 437, 438 (8.3), 543-550 (10.1), 551-556 (10.2) *Supporting SE/TE* : 186 (4.2)

Items in brackets are not required until Algebra 2.

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

	Standard	Pages or Locations Where Standard is Addressed
Domain: Building Functions		
F.BF.1	Write a function that describes a relationship between two quantities.	
	a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	*Primary SE/TE* : 175, 178, 180 (4.1), 181, 184, 186 (4.2), 209, 213, 215-216 (4.6), 309, 311-312 (6.3), 314, 317-322 (6.4), 341, 343-346 (6.7), 445, 448 (8.4), 453, 454, 456-458 (8.5), 459-468 (8.6) *Supporting SE/TE* : 198, 200 (4.4)
	b. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*	*Supporting SE/TE* : 322 (6.4), 430 (8.2)
F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*	*Primary SE/TE* : 209-216 (4.6), 331-338 (6.6), 339-346 (6.7)
F.BF.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	*Primary SE/TE* : 145-154 (3.6), 155-162 (3.7), 305-312 (6.3), 419-424 (8.1), 425-430 (8.2), 441-448 (8.4)
F.BF.4	Find inverse functions.	
	a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. *For example, f(x) =2 x3 or f(x) = (x+1)/(x-1) for x ≠ 1.*	*Primary SE/TE* : 567-574 (10.4)
Domain: Linear, Quadratic, and Exponential Models		
F.LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.	
	a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	*Primary SE/TE* : 305-312 (6.3) *Supporting SE/TE* : 135-144 (3.5)
	b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	*Primary SE/TE* : 111-120 (3.2), 175-180 (4.1), 181-186 (4.2) *Supporting SE/TE* : 459-468 (8.6)
	c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	*Primary SE/TE* : 315, 316, 320-322 (6.4) *Supporting SE/TE* : 305-312 (6.3), 459-468 (8.6)
F.LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	*Primary SE/TE* : 175-180 (4.1), 181-186 (4.2), 187-192 (4.3), 209-216 (4.6), 305-312 (6.3), 313-322 (6.4), 331-338 (6.6), 339-346 (6.7)
F.LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	*Primary SE/TE* : 459-468 (8.6)
F.LE.5	Interpret the parameters in a linear or exponential function in terms of a context.	*Primary SE/TE* : 140, 142-144 (3.5), 198, 200 (4.4), 201-208 (4.5) *Supporting SE/TE* : 313-322 (6.4)

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
Conceptual Category: Statistics and Probability		
Domain: Interpreting Categorical and Quantitative Data		
S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).	*Primary SE/TE* : 593-598 (11.2), 599-606 (11.3), 617-622 (11.5)
S.ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	*Primary SE/TE* : 599-606 (11.3)
S.ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	*Primary SE/TE* : 585-592 (11.1), 593-598 (11.2), 599-606 (11.3)
S.ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	*Primary SE/TE* : 609-616 (11.4)
S.ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	
	a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	*Primary SE/TE* : 195, 198, 200 (4.4), 201-208 (4.5)
	b. Informally assess the fit of a function by plotting and analyzing residuals.	*Primary SE/TE* : 202, 203, 206-208 (4.5)
	c. Fit a linear function for a scatter plot that suggests a linear association.	*Primary SE/TE* : 195, 198, 200 (4.4), 201-208 (4.5)
S.ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	*Primary SE/TE* : 198, 200 (4.4), 204, 207, 208 (4.5)
S.ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.	*Primary SE/TE* : 203, 204, 206-208 (4.5)
S.ID.9	Distinguish between correlation and causation.	*Primary SE/TE* : 205, 207, 208 (4.5)

Items in brackets are not required until Algebra 2.

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

	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. 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, page 27 Chapter 2, page 87 Chapter 3, pages 103-110, 129 Chapter 4, page 147 Chapter 5, page 247, 273 Chapter 8, page 418 Chapter 9, pages 478, 489, 505, 525
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, page 35 Chapter 2, page 81 Chapter 4, page 195 Chapter 7, pages 357, 365, 385, 403 Chapter 8, page 419 Chapter 9, 479

	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. Which One Doesn't Belong and Making an Argument encourage debate and sensemaking. ***Sample references:*** Chapter 1, page 11 Chapter 3, page 111, 135 Chapter 4, pages 201, 217 Chapter 5, page 247 Chapter 6, pages 299, 305 Chapter 8, pages 431, 449 Chapter 10, page 542 Chapter 11, page 585
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. Throughout this series, students use graphs, tables, charts, number lines, diagrams, and formulas to organize, make sense of, and identify realistic solutions to real-life situations. ***Sample references:*** Chapter 1, pages 6, 7, 14, 16, 22, 23 Chapter 2, pages 70, 71, 76, 77, 84 Chapter 3, pages 124, 125, 140 Chapter 4, pages 175, 178, 180, 184, 186, 192 Chapter 5, pages 238, 240 Chapter 6, pages 309, 311, 313-322 Chapter 7, pages 374-376, 380, 382 Chapter 8, pages 435, 437, 438, 445 Chapter 9, pages 483, 486, 496, 500, 510, 517, 522 Chapter 10, pages 559, 563-566 Chapter 11, pages 584, 593, 609

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 paper and pencil, rulers, protractors, graphing calculators, spreadsheets, dynamic geometry software, websites, and other external resources are provided for students throughout the series. ***Sample references:*** Chapter 1, pages 8, 16 Chapter 2, page 52 Chapter 3, pages 102, 111, 145 Chapter 4, pages 181, 187, 200 Chapter 5, pages 234, 240, 261, 264, 266, 267 Chapter 6, pages 325, 335, 346 Chapter 7, pages 356, 377, 391 Chapter 8, page 425, 437, 438, 441, 468 Chapter 9, page 515 Chapter 11, page 592, 605, 617
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 explorations, 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 1, page 2 Chapter 2, pages 53-60 Chapter 3, pages 121-126 Chapter 5, page 241 Chapter 8, page 452 Chapter 9, pages 497, 499, 500 Chapter 10, page 567 Chapter 11, page 599

Big Ideas Math: A Common Core Curriculum Algebra 1 © 2015
Correlated to
Common Core State Standards for High School Algebra 1

Standard		Pages or Locations Where Standard is Addressed
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 1, pages 13, 19 Chapter 2, page 67, 75, 83 Chapter 3, page 146, 155 Chapter 4, pages 209-216 Chapter 6, pages 290, 331-338, 339-346 Chapter 7, pages 371-376, 397-402 Chapter 8, page 452 Chapter 9, page 482 Chapter 10, pages, 543, 552, 561, 569
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 using the four-step problem solving plan. ***Sample references:*** Chapter 1, pages 6, 7, 14, 15, 22, 29 Chapter 2, pages 64, 70, 76, 84, 90 Chapter 3, pages 124, 132, 140 Chapter 4, page 178, 184, 190, 215, 216 Chapter 5, page 238, 244, 246, 250, 256, 264, 270, 277 Chapter 6, pages 302, 309, 318, 335 Chapter 7, page 376, 388, 400, 406 Chapter 8, pages 428, 435, 445 Chapter 9, page 483, 510, 517, 523 Chapter 10, page 547, 551, 563

Items in brackets are not required until Algebra 2.