Amplify Math

Louisiana Student Standards for Mathematics, Algebra 1

The following correlations show the alignment of Amplify Math Algebra 1 to the Louisiana Student Standards for Algebra 1. Modeling standards are indicated by the star symbol (★). For modeling standards, Please also see the Mathematical Modeling Prompts 1–9 as part of Additional Practice provided for Algebra 1.

Number and Quantity (N)		Amplify Math Lesson(s)
Use properties of rational and irrational numbers.		
N-RN.B.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.	**Unit 6**, Lesson 17
Reason quantitatively and use units to solve problems.		
N-Q.A.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. ★	**Unit 3**, Lesson 8 **Unit 4**, Lessons 7, 10, 19, 20
N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. ★	**Unit 1**, Lessons 5, 22, 24-26 **Unit 4**, Lessons 1, 10 Please also see the Mathematical Modeling Prompts 1–9 as part of Additional Practice provided for Algebra 1.
N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. ★	**Unit 2**, Lesson 13 **Unit 4**, Lesson 12
Algebra (A)		Amplify Math Lesson(s)
Interpret the structure of expressions.		
A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. ★	**Unit 4**, Lessons 4, 5, 15–18 **Unit 5**, Lesson 23
A-SSE.A.1.a	Interpret parts of an expression, such as terms, factors, and coefficients.	**Unit 4**, Lessons 4, 5, 15–18 **Unit 5**, Lesson 23
A-SSE.A.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.	**Unit 4**, Lessons 18, 19, 21

A-SSE.A.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 $(x^2 - y^2)(x^2 + y^2)$, or see $2x^2 + 8x$ as $(2x)(x) + 2x(4)$, thus recognizing it as a polynomial whose terms are products of monomials and the polynomial can be factored as $2x(x + 4)$.*	**Unit 4**, Lessons 4, 15–19, 21 **Unit 5**, Lesson 12 **Unit 6**, Lessons 6–8, 10–12, 14, 15, 19
Write expressions in equivalent forms to solve problems.		
A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★	**Unit 4**, Lessons 19, 21 **Unit 5**, Lessons 10–13, 17, 19, 23 **Unit 6**, Lessons 4, 12, 14
A-SSE.B.3.a	Factor a quadratic expression to reveal the zeros of the function it defines.	**Unit 6**, Lessons 6, 9, 10
A-SSE.B.3.b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	**Unit 6**, Lesson 14
A-SSE.B.3.c	Use the properties of exponents to transform expressions for exponential functions emphasizing integer exponents. *For example, the growth of bacteria can be modeled by either $f(t) = 3^{(t+2)}$ or $g(t) = 9(3^t)$ because the expression $3^{(t+2)}$ can be rewritten as $(3^t)(3^2) = 9(3^t)$.*	**Unit 4**, Lessons 18, 19, 21
Perform arithmetic operations on polynomials.		
A-APR.A.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.	*This standard is addressed in Amplify Math Algebra 2, Unit 2, Lessons 2, 4, 5, 15, 23.* *These lessons will be available to students and teachers as a part of the Algebra 1 digital license as digital lessons and downloadable PDFs.*
Understand the relationship between zeros and factors of polynomials.		
A-APR.B.3	Identify zeros of quadratic functions, and use the zeros to sketch a graph of the function defined by the polynomial.	**Unit 5**, Lessons 8, 9, 13–20 **Unit 6,** Lessons 6, 9, 10, 14
Create equations that describe numbers or relationships.		
A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, and exponential functions. ★	**Unit 1**, Lessons 4, 5, 13, 24–26 **Unit 4**, Lessons 4, 5, 12 **Unit 6,** Lessons 1, 2, 22, 23

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A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. ★	**Unit 1**, Lessons 2–7, 9–12, 17, 19, 21–24, 26 **Unit 4**, Lessons 4–6, 8–10, 12 **Unit 6,** Lessons 22, 24
A-CED.A.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.* ★	**Unit 1**, Lessons 2–6, 10, 11, 13, 16, 17, 22, 24–26 **Unit 6**, Lesson 1
A-CED.A.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.* ★	**Unit 1**, Lessons 9–12 **Unit 3**, Lesson 19 **Unit 6**, Lesson 23

Understand solving equations as a process of reasoning and explain the reasoning.

A-REI.A.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.	**Unit 1**, Lessons 7, 8 **Unit 3**, Lesson 6 **Unit 6**, Lessons 2–5

Solve equations and inequalities in one variable.

A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**Unit 1**, Lessons 4, 9, 10, 13, 14 **Unit 6**, Lessons 2, 4
A-REI.B.4	Solve quadratic equations in one variable.	**Unit 6**, Lessons 2, 4, 5, 9, 22, 24
A-REI.B.4.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.	**Unit 6**, Lessons 11, 13, 15, 16, 19
A-REI.B.4.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 "no real solution."	**Unit 6**, Lessons 3, 5, 6, 9–11, 13, 15, 16, 18–23

Solve systems of equations.

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A-REI.C.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.	**Unit 1**, Lesson 21
A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**Unit 1**, Lessons 17−22

Represent and solve equations and inequalities graphically.

A-REI.D.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).	**Unit 1**, Lessons 6, 11, 12 **Unit 6**, Lesson 5
A-REI.D.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, piecewise linear (to include absolute value), and exponential functions. ★	**Unit 1**, Lessons 17, 18 **Unit 3**, Lesson 6, 11 **Unit 4**, Lessons 3, 13, 16, 20 **Unit 6,** Lesson 23
A-REI.D.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.	**Unit 1**, Lessons 15, 16, 23−26

Functions (F)	**Amplify Math Lesson(s)**

Understand the concept of a function, and use function notation.

F-IF.A.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 $y = f(x)$.	**Unit 3**, Lessons 1−3, 5, 11 **Unit 4**, Lesson 10
F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**Unit 3**, Lessons 3−6, 9, 14, 15, 20, 22 **Unit 4**, Lessons 11, 19 **Unit 5**, Lessons 5, 14, 18 **Unit 6**, Lesson 21

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F-IF.A.3	Recognize that sequences are functions whose domain is a subset of the integers. Relate arithmetic sequences to linear functions and geometric sequences to exponential functions.	**Unit 4**, Lesson 10 *Arithmetic and geometric sequences are addressed in Amplify Math Algebra 2, Unit 1, Lessons 2—7.* *These lessons will be available to students and teachers as a part of the Algebra 1 digital license as digital lessons and downloadable PDFs.*
Interpret functions that arise in applications in terms of the context.		
F-IF.B.4	For linear, piecewise linear (to include absolute value), quadratic, and exponential functions that model 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; and end behavior.* ★	**Unit 3**, Lessons 1-7, 11-14, 20, 22 **Unit 4**, Lessons 7, 8, 10, 13 **Unit 5**, Lessons 1, 2, 9, 13-15, 18-20, 22 **Unit 6**, Lessons 1, 10
F-IF.B.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.* ★	**Unit 3**, Lessons 8, 10, 11, 14, 15 **Unit 4**, Lessons 10−12 **Unit 5**, Lessons 8, 9, 15
F-IF.B.6	Calculate and interpret the average rate of change of a linear, quadratic, piecewise linear (to include absolute value), and exponential function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★	**Unit 3**, Lessons 9, 10, 12−17, 22 **Unit 4**, Lessons 14, 16, 22
Analyze functions using different representations.		
F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★	**Unit 3**, Lessons 5, 6, 14, 22 **Unit 4**, Lessons 6, 7, 11, 13, 16, 20 **Unit 5**, Lessons 14, 16, 17, 20
F-IF.C.7.a	Graph linear and quadratic functions and show intercepts, maxima, and minima.	**Unit 3**, Lessons 5−13 **Unit 5**, Lessons 8, 9, 14−22
F-IF.C.7.b	Graph piecewise linear (to include absolute value) and exponential functions.	**Unit 3**, Lessons 14−17 **Unit 4**, Lessons 3, 4, 6−11, 13, 14, 16, 20

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F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	**Unit 4**, Lessons 18, 19, 21 **Unit 5**, Lessons 14, 17–21 **Unit 6**, Lesson 24
F-IF.C.8.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.	**Unit 5**, Lessons 14, 19 **Unit 6**, Lessons 9, 14
F-IF.C.9	Compare properties of two functions (linear, quadratic, piecewise linear [to include absolute value] or exponential) 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, determine which has the larger maximum.*	**Unit 3**, Lessons 2, 7, 8, 14–17 **Unit 4**, Lessons 2, 3, 12, 20, 21 **Unit 5**, Lessons 8, 9, 14–22
Build a function that models a relationship between two quantities.		
F-BF.A.1	Write a linear, quadratic, or exponential function that describes a relationship between two quantities. ★	**Unit 3**, Lessons 5, 14, 17, 20–22 **Unit 4**, Lessons 4, 6, 8–10, 12 **Unit 5**, Lessons 5, 7, 8, 23 **Unit 6**, Lessons 2, 6, 7, 14
F-BF.A.1.a	Determine an explicit expression, a recursive process, or steps for calculation from a context.	**Unit 3**, Lesson 17 **Unit 4**, Lessons 5, 16–19 **Unit 5**, Lessons 2–9
Build new functions from existing functions.		
F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). Without technology, find the value of k given the graphs of linear and quadratic functions. With technology, experiment with cases and illustrate an explanation of the effects on the graph that include cases where $f(x)$ is a linear, quadratic, piecewise linear (to include absolute value), or exponential function.	**Unit 3**, Lessons 15, 17 **Unit 4**, Lessons 7, 13 **Unit 5**, Lessons 16, 17, 21, 22
Construct and compare linear, quadratic, and exponential models, and solve problems.		
F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. ★	**Unit 4**, Lessons 1–6, 12, 20, 22
F-LE.A.1.a	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. ★	**Unit 4**, Lessons 2, 3
F-LE.A.1.b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. ★	**Unit 4**, Lessons 2, 3, 5

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F-LE.A.1.c	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. ★	**Unit 4**, Lessons 2–6
F-LE.A.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). ★	**Unit 3**, Lessons 2–6 **Unit 4**, Lessons 4–6, 8–14, 17, 18, 20, 22
F-LE.A.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. ★	**Unit 4**, Lessons 3, 20 **Unit 5**, Lesson 6
Interpret expressions for functions in terms of the situation they model.		
F-LE.B.5	Interpret the parameters in a linear, quadratic, or exponential function in terms of a context. ★	**Unit 3**, Lesson 7, 12 **Unit 4**, Lessons 4–9, 11–13, 17, 19 **Unit 5**, Lessons 12–22

Statistics and Probability (S)		Amplify Math Lesson(s)
Summarize, represent, and interpret data on a single count or measurement variable.		
S-ID.A.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. ★	**Unit 2**, Lessons 4–10, 22
S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★	**Unit 2**, Lessons 5, 8, 10
Summarize, represent, and interpret data on two categorical and quantitative variables.		
S-ID.B.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. ★	**Unit 2**, Lessons 15–18, 22
S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. ★	**Unit 2**, Lessons 11–14, 18–22
S-ID.B.6.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 and quadratic models. ★	**Unit 2**, Lessons 12-14, 20 **Unit 3**, Lesson 20 **Unit 4**, Lesson 22
S-ID.B.6.b	Informally assess the fit of a function by plotting and analyzing residuals. ★	**Unit 2**, Lessons 13, 14

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S-ID.B.6.c	Fit a linear function for a scatter plot that suggests a linear association. ★	**Unit 2**, Lessons 13, 14
Interpret linear models.		
S-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ★	**Unit 2**, Lessons 12, 22
S-ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit. ★	**Unit 2**, Lessons 19, 20, 22
S-ID.C.9	Distinguish between correlation and causation. ★	**Unit 2**, Lessons 21, 22

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Standards for Mathematical Practice, Louisiana Student Standards, Algebra 1

The following correlations show the alignment of Amplify Math, Algebra 1, to the Standards for Mathematical Practice for Louisiana Student Standards.

Mathematical Practices	Amplify Math Lesson(s)
MP1 Make sense of problems and persevere in solving them.	
Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	**Unit 1**, Lessons 1, 2, 6, 22, 26 **Unit 2**, Lesson 18 **Unit 3**, Lessons 1, 2, 12, 13 **Unit 5**, Lesson 5 **Unit 6**, Lessons 1, 2, 3, 9, 10, 12, 14, 18, 19, 22, 23
MP2 Reason abstractly and quantitatively.	
Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize — to 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 the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	**Unit 1**, Lessons 1, 3–7, 10–14, 16, 17, 23–25 **Unit 2**, Lessons 1, 2, 4, 5, 8–12 **Unit 3**, Lessons 3–6, 11, 18, 19 **Unit 4**, Lessons 4, 6, 9, 11, 14, 20 **Unit 5**, Lessons 2, 4, 5, 15, 18, 19, 22, 23 **Unit 6**, Lessons 1–4, 17, 21–24

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MP3 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. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and — if there is a flaw in an argument — explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Unit 1, Lessons 3, 8, 19, 21
Unit 2, Lessons 3, 7−9, 11, 13, 14, 19−22
Unit 3, Lesson 3
Unit 4, Lessons 11, 15, 17, 20
Unit 5, Lessons 3, 5, 6, 16, 21
Unit 6, Lessons 5, 6, 10, 13, 15, 17, 20, 21, 23, 24

MP4 Model with mathematics.

Mathematically proficient students can 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. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Unit 1, Lessons 4, 5, 10, 11, 13, 15−17, 20, 25, 26
Unit 2, Lessons 2, 4, 12, 15, 21
Unit 3, Lessons 1, 2, 9, 12, 15, 20−22
Unit 4, Lessons 1−3, 6, 8−13, 15−20, 22
Unit 5, Lessons 1, 7, 9, 11, 15, 22, 23
Unit 6, Lessons 1, 2, 4, 12, 22

Please also see the Mathematical Modeling Prompts 1−9 as part of Additional Practice provided for Algebra 1.

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MP5 Use appropriate tools strategically.	
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students 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. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.	**Unit 1**, Lessons 6, 8, 10, 17 **Unit 2**, Lessons 6, 7, 20, 22 **Unit 4**, Lessons 1, 4, 6, 12, 20 **Unit 5**, Lessons 8, 11 **Unit 6**, Lessons 3, 5, 16, 21

MP6 Attend to precision.	
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	**Unit 1**, Lessons 5, 6, 12, 18, 19, 22, 23 **Unit 2**, Lessons 1, 3, 5, 6, 8, 12, 14–16, 19 **Unit 3**, Lessons 3, 4, 7–11, 13, 22 **Unit 4**, Lessons 2, 7, 10, 12, 19 **Unit 5**, Lessons 9, 11, 18, 20, 21 **Unit 6**, Lessons 9, 10, 12–14, 16, 18, 20, 21, 23

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MP7 Look for and make use of structure.	
Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, 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 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 × 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. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	**Unit 1,** Lessons 3, 7, 9, 11, 12, 14, 18, 19, 22 **Unit 2**, Lessons 2, 5, 8, 13, 16, 17, 18 **Unit 3**, Lessons 3, 5, 16, 17, 19, 21 **Unit 4**, Lessons 2, 5, 12, 13, 15, 18, 19, 21 **Unit 5**, Lessons 2−7, 10−14, 16−22 **Unit 6**, Lessons 3-5, 7−15, 18, 20, 22−24

MP8 Look for and express regularity in repeated reasoning.	
Mathematically proficient students notice if calculations are repeated, and 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 repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with 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 them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	**Unit 1**, Lessons 2, 8, 9, 14, 15 **Unit 2**, Lesson 7 **Unit 4**, Lessons 4, 5, 14, 16 **Unit 5**, Lessons 3, 4, 7, 8, 17, 21 **Unit 6**, Lessons 3, 6−8, 11, 14, 15, 17, 19, 24