

## Standards to Topics

Common Core State Standards 2010

Intensified Algebra I

Grade 6

6-RP.01

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

8. Algebraic thinking and how learning feels

6-RP.02

Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is  $3/4$  cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”<sup>1</sup>

8. Algebraic thinking and how learning feels

6-RP.03

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

17. Mindsets and problem solving

6-NS.04

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express  $36 + 8$  as  $4(9 + 2)$ .

1. Exploring problem-solving strategies

6-NS.05

Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

1. Exploring problem-solving strategies

6-NS.06.a

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g.,  $-(-3) = 3$ , and that 0 is its own opposite.

1. Exploring problem-solving strategies

6-NS.06.c

Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

22. Quadratic models and equations

6-NS.07.c

Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of  $-30$  dollars, write  $|-30| = 30$  to describe the size of the debt in dollars.

1. Exploring problem-solving strategies

6-EE.01

Write and evaluate numerical expressions involving whole-number exponents.

19. Exponents and exponential models

6-EE.02.a

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract  $y$  from 5" as  $5 - y$ .

3. Foundations of algebra

6-EE.02.c

Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas  $V = s^3$  and  $A = 6s^2$  to find the volume and surface area of a cube with sides of length  $s = 1/2$ .

3. Foundations of algebra

## Grade 6

6-EE.03

Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression  $3(2 + x)$  to produce the equivalent expression  $6 + 3x$ ; apply the distributive property to the expression  $24x + 18y$  to produce the equivalent expression  $6(4x + 3y)$ ; apply properties of operations to  $y + y + y$  to produce the equivalent expression  $3y$ .

3. Foundations of algebra

11. Staying motivated while solving problems

6-EE.04

Identify when two expressions are equivalent (i. e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions  $y + y + y$  and  $3y$  are equivalent because they name the same number regardless of which number  $y$  stands for.

3. Foundations of algebra

6-EE.05

Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

13. Solving linear equations

15. Solving linear inequalities

6-EE.06

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

3. Foundations of algebra

4. Representing mathematical relationships in multiple ways

5. Problem solving and metacognition

6. Working with functions and equations

13. Solving linear equations

14. Problem solving in a community of learners

15. Solving linear inequalities

6-EE.07

Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$  and  $x$  are all nonnegative rational numbers.

13. Solving linear equations

14. Problem solving in a community of learners

6-EE.08

Write an inequality of the form  $x > c$  or  $x < c$  to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form  $x > c$  or  $x < c$  have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

15. Solving linear inequalities

## Grade 6

## 6-EE.09

Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation  $d = 65t$  to represent the relationship between distance and time.

- 6. Working with functions and equations
- 10. Understanding slope and intercepts
- 11. Staying motivated while solving problems
- 13. Solving linear equations

## Grade 7

## 7-RP.01

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks  $\frac{1}{2}$  mile in each  $\frac{1}{4}$  hour, compute the unit rate as the complex fraction  $(\frac{1}{2})/(\frac{1}{4})$  miles per hour, equivalently 2 miles per hour.

- 8. Algebraic thinking and how learning feels

## 7-RP.02.a

Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

- 6. Working with functions and equations
- 8. Algebraic thinking and how learning feels
- 9. Exploring rate of change in other situations

## 7-RP.02.b

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

- 6. Working with functions and equations
- 8. Algebraic thinking and how learning feels

## 7-RP.02.c

Represent proportional relationships by equations. For example, if total cost  $t$  is proportional to the number  $n$  of items purchased at a constant price  $p$ , the relationship between the total cost and the number of items can be expressed as  $t = pn$ .

- 6. Working with functions and equations

7-RP.02.d

Explain what a point  $(x, y)$  on the graph of a proportional relationship means in terms of the situation, with special attention to the points  $(0, 0)$  and  $(1, r)$  where  $r$  is the unit rate.

6. Working with functions and equations

7-NS.01.a

Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.

1. Exploring problem-solving strategies

7-NS.01.b

Understand  $p + q$  as the number located a distance  $|q|$  from  $p$ , in the positive or negative direction depending on whether  $q$  is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

1. Exploring problem-solving strategies

7-NS.01.c

Understand subtraction of rational numbers as adding the additive inverse,  $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

1. Exploring problem-solving strategies

7-NS.01.d

Apply properties of operations as strategies to add and subtract rational numbers.

1. Exploring problem-solving strategies

7-NS.02.a

Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as  $(-1)(-1) = 1$  and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

2. Getting smarter through algebraic reasoning

7-NS.02.b

Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If  $p$  and  $q$  are integers, then  $-(p/q) = (-p)/q = p/(-q)$ . Interpret quotients of rational numbers by describing realworld contexts.

2. Getting smarter through algebraic reasoning

## Grade 7

7-NS.02.c

Apply properties of operations as strategies to multiply and divide rational numbers.

2. Getting smarter through algebraic reasoning

7-EE.01

Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

3. Foundations of algebra  
13. Solving linear equations

7-EE.02

Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example,  $a + 0.05a = 1.05a$  means that “increase by 5%” is the same as “multiply by 1.05.”

11. Staying motivated while solving problems

7-EE.03

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional  $\frac{1}{10}$  of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar  $9\frac{3}{4}$  inches long in the center of a door that is  $27\frac{1}{2}$  inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

1. Exploring problem-solving strategies  
2. Getting smarter through algebraic reasoning

7-EE.04

Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

3. Foundations of algebra

## Grade 7

7-EE.04.a

Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

13. Solving linear equations

7-EE.04.b

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

15. Solving linear inequalities

## Grade 8

8-NS.01

Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

22. Quadratic models and equations

8-NS.02

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.,  $\pi^2$ ). For example, by truncating the decimal expansion of the square root of 2, show that the square root of 2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

22. Quadratic models and equations

8-EE.01

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example,  $3^2 \times 3^{-5} = 3^{-3} = 1/(3)^3 = 1/27$ .

19. Exponents and exponential models

8-EE.02

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 the square root of 2 is irrational.

22. Quadratic models and equations

8-EE.03

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. For example, estimate the population of the United States as  $3 \times 10^8$  and the population of the world as  $7 \times 10^9$ , and determine that the world population is more than 20 times larger.

20. Attributions and reasoning with quantities

8-EE.04

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.

20. Attributions and reasoning with quantities

8-EE.05

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

6. Working with functions and equations  
9. Exploring rate of change in other situations  
19. Exponents and exponential models

8-EE.06

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  $b$ .

10. Understanding slope and intercepts

8-EE.07.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).

13. Solving linear equations

8-EE.07.b

Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

13. Solving linear equations

8-EE.08.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.

16. Formulating and solving systems  
18. Other methods for solving systems

8-EE.08.b

Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example,  $3x + 2y = 5$  and  $3x + 2y = 6$  have no solution because  $3x + 2y$  cannot simultaneously be 5 and 6.

16. Formulating and solving systems  
18. Other methods for solving systems

8-EE.08.c

Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

16. Formulating and solving systems  
17. Mindsets and problem solving  
18. Other methods for solving systems

8-F.01

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.<sup>1</sup>

6. Working with functions and equations

## Grade 8

8-F.02

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

9. Exploring rate of change in other situations

8-F.03

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. For example, the function  $A = s^2$  giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

10. Understanding slope and intercepts

8-F.04

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.

9. Exploring rate of change in other situations

10. Understanding slope and intercepts

8-F.05

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.

7. Exploring rate of change in motion problems

9. Exploring rate of change in other situations

21. Problem solving with exponential functions

8-SP.01

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.

12. Creating linear models for data

## Grade 8

8-SP.02

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.

12. Creating linear models for data

8-SP.03

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.

12. Creating linear models for data

## Number and Quantity

N-RN.01

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.

19. Exponents and exponential models

N-RN.02

Rewrite expressions involving radicals and rational exponents using the properties of exponents.

19. Exponents and exponential models

N-Q.01

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.

5. Problem solving and metacognition

## Algebra

A-SSE.01.a

Interpret parts of an expression, such as terms, factors, and coefficients.

23. Polynomial addition and multiplication

## Algebra

<p>A-SSE.03.a</p> <p>Factor a quadratic expression to reveal the zeros of the function it defines.</p>	24. Factoring and quadratic equations
<p>A-APR.01</p> <p>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.</p>	23. Polynomial addition and multiplication
<p>A-APR.03</p> <p>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.</p>	24. Factoring and quadratic equations
<p>A-CED.01</p> <p>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.</p>	11. Staying motivated while solving problems 19. Exponents and exponential models
<p>A-CED.02</p> <p>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p>	3. Foundations of algebra 4. Representing mathematical relationships in multiple ways 10. Understanding slope and intercepts 11. Staying motivated while solving problems 12. Creating linear models for data 19. Exponents and exponential models 20. Attributions and reasoning with quantities 21. Problem solving wit
<p>A-CED.03</p> <p>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.</p>	15. Solving linear inequalities 16. Formulating and solving systems
<p>A-CED.04</p> <p>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law <math>V = IR</math> to highlight resistance <math>R</math>.</p>	13. Solving linear equations

## Algebra

## A-REI.01

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.

13. Solving linear equations

## A-REI.03

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

13. Solving linear equations  
15. Solving linear inequalities

## A-REI.04.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  $b$ .

22. Quadratic models and equations  
24. Factoring and quadratic equations

## A-REI.05

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.

18. Other methods for solving systems

## A-REI.06

Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

16. Formulating and solving systems  
18. Other methods for solving systems

## 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.

13. Solving linear equations  
22. Quadratic models and equations

*Algebra*

## 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.

## 15. Solving linear inequalities

*Functions*

## F-IF.01

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  $y = f(x)$ .

## 3. Foundations of algebra

## 6. Working with functions and equations

## F-IF.02

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

## 6. Working with functions and equations

## F-IF.04

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.\*

## 10. Understanding slope and intercepts

## 19. Exponents and exponential models

## 21. Problem solving with exponential functions

## F-IF.05

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.\*

## 4. Representing mathematical relationships in multiple ways

## F-IF.06

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.\*

## 7. Exploring rate of change in motion problems

## 9. Exploring rate of change in other situations

## 10. Understanding slope and intercepts

## 11. Staying motivated while solving problems

## Functions

F-IF.07.a

Graph linear and quadratic functions and show intercepts, maxima, and minima.

10. Understanding slope and intercepts  
 11. Staying motivated while solving problems  
 22. Quadratic models and equations  
 24. Factoring and quadratic equations

F-IF.07.e

Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

19. Exponents and exponential models  
 21. Problem solving with exponential functions

F-IF.09

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.

10. Understanding slope and intercepts  
 12. Creating linear models for data  
 19. Exponents and exponential models  
 21. Problem solving with exponential functions  
 22. Quadratic models and equations

F-BF.01.a

Determine an explicit expression, a recursive process, or steps for calculation from a context.

3. Foundations of algebra  
 10. Understanding slope and intercepts  
 11. Staying motivated while solving problems  
 19. Exponents and exponential models  
 20. Attributions and reasoning with quantities  
 21. Problem solving with exponential functions

F-BF.03

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.

10. Understanding slope and intercepts  
 12. Creating linear models for data  
 19. Exponents and exponential models  
 21. Problem solving with exponential functions

F-LE.01.a

Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

19. Exponents and exponential models

F-LE.01.b

Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

7. Exploring rate of change in motion problems  
 10. Understanding slope and intercepts

*Functions*

F-LE.01.c

Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

19. Exponents and exponential models

F-LE.02

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).

10. Understanding slope and intercepts  
12. Creating linear models for data  
14. Problem solving in a community of learners  
19. Exponents and exponential models  
21. Problem solving with exponential functions

F-LE.05

Interpret the parameters in a linear or exponential function in terms of a context.

10. Understanding slope and intercepts  
12. Creating linear models for data  
19. Exponents and exponential models

*Statistics and Probability*

S-ID.06.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.

10. Understanding slope and intercepts  
12. Creating linear models for data

S-ID.06.c

Fit a linear function for a scatter plot that suggests a linear association.

12. Creating linear models for data

S-ID.07

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

12. Creating linear models for data