



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

The LEARN Performance Level Descriptors (PLDs) reflect the learning path for each standard based on students' natural progression of skills and levels of thinking for specific content. These learning progressions should be used to assess and teach students at various developmental levels. The ILEARN PLDs present learning progressions for each assessed standard. They are divided into four "buckets" in alignment with the ILEARN proficiency levels: Below Proficiency, Approaching Proficiency, At Proficiency, and Above Proficiency.

This PLD map represents the Summative standards assessed in grades six through eight, organized by domain and vertically aligned. Students may move through the learning progressions of each concept in various ways depending on the current knowledge they possess. Using the ILEARN Checkpoint student-level proficiency data for each reporting category alongside classroom assessments, educators can pinpoint where students are along the continuum of each standard's learning progression. Using high-quality teaching practices and materials, educators can support student growth horizontally across proficiency levels or vertically between grade levels. The ILEARN Item Specifications and 2023 Math Frameworks can assist educators in further defining each proficiency level and providing high-quality instruction. For more support using and interpreting PLDs, visit the [PLD Guide](#).

Number Sense					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.NS.1 Use positive and negative numbers to represent and compare quantities in real-world contexts, explaining the meaning of 0 in each situation. (E) (<i>Checkpoint 1</i>)	Integers and Rational Numbers	Identify the positive or negative number that represents a given quantity in a real-world situation.	Identify and interpret real-world situations that can be modeled using a positive number, negative number, or 0.	Represent and compare positive and negative numbers in a given real-world situation. Identify, interpret, or explain the meaning of 0 in each situation.	Critique a representation of a real-world situation or explain the structure of a model that involves positive numbers, negative numbers, or 0 in a given context.
7.NS.1 Show on a number line that a number and its opposite have a sum of 0 (are additive inverses). Find and interpret sums of rational numbers in real-world contexts.	Computing with Rational Numbers	Calculate the sum of a number and its opposite on a number line; OR identify expressions that represent given points on a number line.	Calculate the distance between two points on the opposite sides of zero on a number line to solve mathematical and real-world problems.	Calculate the sum of rational numbers with opposite signs to solve mathematical and real-world problems.	Identify, write, and reason about generalizations of mathematics principles when given an addition expression or a number line with variables.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

<i>(Checkpoint 1)</i>					
8.NS.1 Give examples of rational and irrational numbers, and explain the difference between them. State decimal equivalents for any number. For rational numbers, show that the decimal equivalent terminates or repeats, and convert a repeating decimal into a rational number. <i>(Summative Only)</i>	Real Numbers	Classify given numbers as rational or irrational.	Convert given fractions into decimals and classify them as terminating or repeating; OR convert a repeating decimal into a rational number.	Classify a given number as rational or irrational and justify the reasoning for each classification.	Analyze, justify, and apply reasoning to prove or disprove a generalization about rational or irrational numbers.
<i>Concept continues in AI.QE.6</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.NS.2 Explain how opposite signs of numbers indicate locations on opposite sides of 0 on the number line; identify the opposite of the opposite of a number. <i>(Checkpoint 1)</i>	Integers and Rational Numbers	Identify the opposite of a number using a number line.	Plot a number and its opposite on a number line.	Identify and write the opposite or the opposite of the opposite of a given number. Reason about the opposite signs of numbers and their locations on a number line to justify solutions.	Apply knowledge of the opposites of numbers to interpret and make claims about given generalizations.
7.NS.2 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. <i>(Checkpoint 1)</i>	Computing with Rational Numbers	Identify or write the absolute value of a given number.	Calculate the distance between two points on a number line, where one point represents a negative rational number and the other point represents a positive rational number.	Subtract rational numbers using their absolute value to solve mathematical and real-world problems.	Identify, write, and reason about generalizations of mathematics principles when given a subtraction expression or a number line with variables.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers. <i>(Checkpoint 1)</i>	Real Numbers	Plot rational approximations of irrational numbers on a number line.	Identify the approximated value of an irrational number.	Compare a rational number and a rational approximation of an irrational number in the form radical (k) or $k\pi$, using inequalities, number lines, or verbal statements.	Use rational approximations of irrational expressions to compare the values of the expressions.
<i>Concept continues in AI.NF.1.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.NS.1</i>					
6.NS.3 Compare and order rational numbers and plot them on a number line. Write, interpret, and explain statements of order for rational numbers in real-world contexts. <i>(Checkpoint 1)</i>	Integers and Rational Numbers	Identify the location of rational numbers on a number line in a mathematical situation.	Identify inequalities to compare rational numbers in mathematical or real-world situations; OR evaluate statements of order and comparison for rational numbers.	Write inequalities to compare rational numbers in mathematical or real-world situations; OR order rational numbers based on a given directive.	Reason about and justify a comparison of rational numbers in a mathematical or real-world situation.
8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers. <i>(Checkpoint 1)</i>	Real Numbers	Plot rational approximations of irrational numbers on a number line.	Identify the approximated value of an irrational number.	Compare a rational number and a rational approximation of an irrational number in the form radical (k) or $k\pi$, using inequalities, number lines, or verbal statements.	Use rational approximations of irrational expressions to compare the values of the expressions.
<i>Concept continues in AI.NF.1.</i>					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.CA.3-10.</i>					
6.NS.4 Solve real-world problems with positive fractions and decimals by using one or two operations. (E) (<i>Checkpoint 1</i>)	Operations with Positive Numbers	Compute fluently with positive fractions and decimals.	Solve one-step real-world problems with positive fractions or decimals and one operation.	Solve two-step real-world problems with positive fractions or decimals.	Evaluate the reasoning of or critique an argument involving the solution to a two-step real-world problem.
7.AF.2 Solve real-world problems with rational numbers by using one or two operations. (E) (<i>Summative Only</i>)	Expressions, Equations, and Inequalities	Identify expressions or steps to solving real-world problems with rational numbers using one or two operations.	Solve real-world problems with rational numbers using one operation.	Solve real-world problems with rational numbers using two operations.	Evaluate the reasoning of or critique an argument involving generalizations and solutions to mathematical or real-world problems with rational numbers using two operations.
8.NS.4 Solve real-world problems with rational numbers by using multiple operations. (E) (<i>Checkpoint 1</i>)	Real Numbers	Identify expressions or steps to solving real-world problems with rational numbers and two or more steps.	Solve real-world problems that involve rational numbers and two steps.	Solve real-world problems that involve rational numbers and three or four steps.	Solve complex, real-world problems that involve several steps.
<i>Concept continues in several Algebra I standards.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 4.CA.3.</i>					
6.NS.5 Apply the order of operations and properties of operations (i.e., identity, inverse, commutative properties)	Operations with Positive Numbers	Evaluate numerical expressions with positive rational numbers and parentheses. Analyze a	Apply the order of operations to evaluate numerical expressions with positive rational	Apply the order of operations and mathematical properties to evaluate numerical	Place grouping symbols within numerical expressions to set it equal to a given value.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with nonnegative rational numbers, including those using grouping symbols, such as parentheses, and involving whole number exponents. (E) <i>(Checkpoint 1)</i>		set of equivalent numerical expressions to identify the applied mathematical property.	numbers, parentheses and brackets. Apply a mathematical property to a given numerical expression to identify an equivalent expression.	expressions with positive rational numbers and a combination of parentheses, brackets, and whole number exponents.	Identify or create multiple equivalent numerical expressions using a mathematical property.
7.NS.3 Use the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. (E) <i>(Checkpoint 1)</i>	Computing with Rational Numbers	Multiply two rational numbers with opposite signs using a model.	Multiply two or more rational numbers by applying the rules for multiplying signed numbers.	Apply the distributive property to simplify expression with rational numbers.	Identify or create multiple equivalent expressions using the properties of operations or the rules for multiplying signed numbers.
7.NS.4 Explain that if p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$ for all nonzero integers. (E) <i>(Checkpoint 1)</i>	Computing with Rational Numbers	Identify equivalent fractions that satisfy $-(p/q) = (-p)/q = p/(-q)$ when p and q are integers.	Identify the quotient of two rational numbers.	Calculate the quotient of two rational numbers using properties of operations or rules for dividing signed numbers.	Generate or identify multiple equivalent fractions that satisfy $-(p/q) = (-p)/q = p/(-q)$ when p and q are integers or using the rules for dividing signed numbers.
7.NS.7 Compute fluently with rational numbers using an algorithmic approach. (E) <i>(Summative Only)</i>	Computing with Rational Numbers	Compute fluently with integers using an algorithmic approach.	Compute fluently with integers and decimals using an algorithmic approach.	Compute fluently with rational numbers using an algorithmic approach.	Identify one or more equivalent expressions when one expression is given.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category:	Below	Approaching	At	Above



	Subdomain				
<i>Concept directly aligns back to 4.CA.4.</i>					
6.NS.6 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 from 1 to 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. (<i>Checkpoint 1</i>)	Operations with Positive Numbers	Identify the greatest common factor of two whole numbers when given a list of factors; OR identify the least common multiple of two whole numbers when given a list of multiples; OR identify equivalent expressions or analyze equivalent expressions using the distributive property to find a missing value.	Identify the greatest common factor of any two whole numbers less than or equal to 100 and the least common multiple of any two whole numbers less than or equal to 12. Use the distributive property to write an equivalent expression for the sum of two whole numbers using the greatest common factor.	Find the greatest common factor of any two whole numbers less than or equal to 100 and the least common multiple of any two whole numbers less than or equal to 12. Apply the distributive property to write an equivalent expression for the sum of two whole numbers using a multiple of the sum.	Solve a real-world problem using the greatest common factor or least common multiple.
7.NS.5 Find the prime factorization of whole numbers and write the results using exponents. (<i>Checkpoint 1</i>)	Exponents and Roots	Classify numbers between 1-100 as either prime or composite or identify the prime factorization of a whole number less than 100 where the prime factorization does not use exponents.	Identify the prime factorization of a whole number less than 100 where the prime factorization uses exponents.	Generate the prime factorization of a whole number using exponents.	Analyze a given prime factorization of a number to verify its accuracy and provide justification.
8.NS.3 Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions. (E) (<i>Checkpoint 1</i>)	Real Numbers	Using only positive exponents, identify expanded notations that represent the application of the properties of exponents.	Apply one property of exponents to identify or generate equivalent numerical expressions.	Apply more than one property of exponents to generate equivalent numerical expressions.	Determine whether multiple expressions both with and without exponents are equivalent and provide justification. Identify missing exponents when given the value of an expression.
<i>Concept continues in AI.NF.2.</i>					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.NS.7 Apply the properties of operations (i.e., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions and to justify whether two linear expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them. (E) (<i>Checkpoint 2</i>)	Expressions and Data Analysis	Identify and name a variable, coefficient, constant, and term within a given algebraic expression, OR combine like terms or decompose a term to write or identify equivalent expressions.	Apply the associative or commutative properties to identify or write equivalent expressions.	Apply the distributive property to create or identify equivalent expressions. Apply a combination of properties, combining like terms or decomposing terms to identify or write equivalent expressions. Justify whether two expressions are equivalent using substitution.	Apply properties of operations, combining like terms, or decomposing terms to write multiple equivalent equations.
7.AF.1 Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring out a common number (e.g., given $2x - 10$, create an equivalent expression $2(x - 5)$). Justify each step in the process. (E) (<i>Checkpoint 3</i>)	Expressions, Equations, and Inequalities	Apply properties of operations as strategies to find missing values of equivalent linear expressions using addition and subtraction. Identify the correct steps in the process or the property applied.	Apply properties of operations as strategies to identify equivalent linear expressions by factoring or applying the distributive property. Identify the correct steps in the process or the property applied.	Apply properties of operations as strategies to construct equivalent linear expressions by factoring, expansion, and/or addition and subtraction. Justify each step in the process.	Apply properties of operations as strategies to identify or create multiple equivalent linear expressions by factoring, expansion, or addition and subtraction. Justify each step in the process.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Concept aligns directly back to 5.NS.3.					
6.NS.8 Evaluate positive rational numbers with whole number exponents. (<i>Summative Only</i>)	Integers and Rational Numbers	Determine the relationship between the base and exponent in an exponential expression.	Identify or write an equivalent expression to a given exponential expression with a rational base and a whole number exponent.	Evaluate an exponential expression with a rational base and a whole number exponent.	Analyze an error made when evaluating an exponential expression with a positive rational number base.
7.NS.6 Apply the inverse relationship between squaring and finding the square root of a perfect square whole number. Find square roots of perfect square whole numbers. (<i>Checkpoint 1</i>)	Exponents and Roots	Identify numbers that are perfect squares.	Calculate square roots of perfect square whole numbers.	Identify and write equivalent expressions involving square roots and the square roots of squared numbers when given a specific value.	Apply the inverse relationship between squaring and square roots to solve mathematical problems.
8.NS.3 Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions. (E) (<i>Checkpoint 1</i>)	Real Numbers	Using only positive exponents, apply one property of exponents to identify equivalent expressions	Apply one property of exponents to generate equivalent numerical expressions.	Apply more than one property of exponents to generate equivalent numerical expressions.	Determine whether multiple expressions both with and without exponents are equivalent and provide justification. Identify missing exponents when given the value of an expression.
Concept continues in AI.NF.2.					

Ratios and Proportional Reasoning					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
Concept directly aligns back to 5.NS.2 and 5.NS.4.					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

6.RP.1 Convert between any two representations (fractions, decimals, percents) of positive rational numbers without the use of a calculator. (E) (<i>Checkpoint 1</i>)	Operations with Positive Numbers	Identify equivalent fractions, decimals and percents using a given model.	Identify or write the equivalent conversion of a positive rational number in one way.	Identify or write the equivalent conversions of a positive rational number in more than one way.	Apply knowledge of equivalent forms of positive rational numbers to justify conversions.
6.RP.2 Understand the concept of a unit rate and use terms related to rate in the context of a ratio relationship. (<i>Checkpoint 3</i>)	Working with Ratios	Identify a unit rate in a real-world context.	Determine the unit rate when given a ratio or a ratio relationship expressed as a model.	Calculate a rate using a given unit rate, or conversely, calculate a unit rate using a given rate within a real-world situation.	Apply knowledge of unit rates and rates to reason through, critique, and justify steps to solving a problem.
7.RP.2 Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups, markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E) (<i>Checkpoint 2</i>)	Proportional Relationships	Use multiplication or addition to find missing ratio values in simple mathematical problems involving ratio or percent.	Analyze and apply proportional relationships to solve simple real-world and mathematical problems, including simple ratio/percent problems.	Analyze and apply proportional relationships to solve more complex or multi-step real-world and mathematical problems.	Analyze and apply proportional relationships to solve complex real-world and mathematical problems, including working backwards problems to find the original cost/value.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.CA.11.</i>					
6.RP.3 Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the	Working with Rates and Ratios	Identify ratios in real-world context and determine if they represent part-to-part or part-to-whole; OR identify or write equivalent ratios.	Calculate the ratio represented in a table of values and determine missing values; OR plot pairs of values from a ratio table on a	Solve mathematical or real-world problems using a table or graph that represents equivalent ratios; OR construct an equivalent table of ratios	Analyze errors when creating a table of equivalent ratios or plotting ratios on a coordinate plane; OR compare and contrast



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

coordinate plane. (<i>Checkpoint 3</i>)			coordinate plane.	when given a ratio.	ratios when given two or more different ratio tables.
7.RP.1 Identify the unit rate or constant of proportionality in tables, graphs, equations, and verbal descriptions of proportional relationships. (<i>Checkpoint 2</i>)	Proportional Relationships	Identify whether two quantities are in a proportional relationship.	Identify a unit rate or constant of proportionality given a verbal description, table or graph with the pair (1, r) included as an entry in the table or point on the graph.	Calculate a unit rate or constant of proportionality given tables, graphs, equations, or verbal descriptions.	Interpret the unit rate or constant of proportionality given a table, graph, equation or a verbal description of a proportional relationship in context. Use the unit rate or constant of proportionality to solve problems or make predictions in context.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.RP.4 Solve real-world and other mathematical problems involving rates and ratios using models and strategies such as reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (E) (<i>Checkpoint 3</i>)	Solving Problems with Rates, Ratios, and Proportions	Identify a model that represents a real-world or mathematical ratio problem.	Solve a real-world or mathematical rate or ratio problem given a model.	Solve a real-world ratio problem using any ratio model or strategy; OR use ratios and ratio models to justify thinking.	Compare two or more ratios to solve a real-world problem.
7.RP.2 Use proportional relationships to solve ratio and percent problems with multiple operations (e.g., simple interest, tax, markups,	Proportional Relationships	Use multiplication or addition to find missing ratio values in simple mathematical problems involving ratio or percent.	Analyze and apply proportional relationships to solve simple real-world and mathematical problems, including	Analyze and apply proportional relationships to solve more complex or multi-step real-world and mathematical problems.	Analyze and apply proportional relationships to solve complex real-world and mathematical problems,



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

markdowns, gratuities, conversions within and across measurement systems, and percent increase and decrease). (E) (Checkpoint 2)			simple ration/percent problems.		including working backwards problems to find the original cost/value.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.RP.5 Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E) (Checkpoint 3)	Solving Problems with Rates, Ratios, and Proportions	Identify the independent and dependent variables in a real-world situation.	Complete a table of values to represent a proportional relationship in a real-world situation; OR analyze the relationship between the independent and dependent values in a table to identify an equation expressing the dependent variable in terms of the independent variable.	Analyze the relationship between the independent and dependent values of a real-world situation to write an equation and represent it graphically; OR solve real-world problems using the relationship between the independent and dependent variables.	Critique statements made about a proportional relationship.
7.AF.5 Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change. (Checkpoint 2)	Slope	Analyze and classify graphs or tables as representing a constant or variable rate of change without computation. Interpret the meaning of slope as the amount of vertical change for each horizontal change.	Analyze given situations to identify those that represent a constant rate of change modeled by a linear function or a varying rate of change.	Analyze situations in context to determine if they model constant or varying rates of change resulting in linear or nonlinear functions and use reasoning about slope, rates of change, and linear functions to	Analyze the rate of change from a given situation or graph, including zero change. Interpret, explain, and/or compare various situations to determine if they can be modeled by a linear function.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

				justify responses.	
8.AF.3 Understand that a function assigns to each x-value (independent variable) exactly one y-value (dependent variable), and that the graph of a function is the set of ordered pairs (x,y). (<i>Checkpoint 2</i>)	Functions	Identify the independent and dependent variables given a table, graph, or set of ordered pairs.	Define the meaning of a function, OR Identify characteristics of a function using a set of ordered pairs.	Apply understanding of functions to determine if a relation is a function or nonfunction.	Explain whether a given representation of a relation in a real-world situation is a function or is not a function, OR Critique an explanation determining if a relation in any form is a function.
<i>Concept continues in several Algebra I standards.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.RP.5 Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E) (<i>Checkpoint 3</i>)	Solving Problems with Rates, Ratios, and Proportions	Identify the independent and dependent variables in a real-world situation.	Complete a table of values to represent a proportional relationship in a real-world situation; OR analyze the relationship between the independent and dependent values in a table to identify an equation expressing the dependent variable in terms of the independent variable.	Analyze the relationship between the independent and dependent values of a real-world situation to write an equation and represent it graphically; OR solve real-world problems using the relationship between the independent and dependent variables.	Critique statements made about a proportional relationship.
7.AF.6 Graph a line given its slope and a point on the line. Find the slope of a line given its graph. (E) (<i>Checkpoint 2</i>)	Slope	Determine if the slope of a given graph is positive, negative, 0, or undefined.	Find the slope of a line given its graph.	Graph a line given its slope and a point on the line.	Determine the slope of a line in the context of a real-world situation. Identify additional points



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

					on a line when given the slope and one point.
8.AF.4 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. (E) <i>(Checkpoint 2)</i>	Functions	Identify a qualitative description given a graph, or a graph given a qualitative description, with no context.	Identify a qualitative description given a graph, or a graph given a qualitative description, within a context.	Construct the graph of a function that matches a given qualitative description.	Use knowledge of qualitative descriptions to interpret and draw conclusions about given graphs within context, OR Sketch a graph of a function given qualitative data in the form of real-world data in context.
<i>Concept continues in several Algebra I standards.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.RP.5 Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E) <i>(Checkpoint 3)</i>	Solving Problems with Rates, Ratios, and Proportions	Identify the independent and dependent variables in a real-world situation.	Complete a table of values to represent a proportional relationship in a real-world situation; OR analyze the relationship between the independent and dependent values in a table to identify an equation expressing the dependent variable in terms of the independent variable.	Analyze the relationship between the independent and dependent values of a real-world situation to write an equation and represent it graphically; OR solve real-world problems using the relationship between the independent and dependent variables.	Critique statements made about a proportional relationship.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

7.RP.3 Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to $y = mx$. (E) (<i>Checkpoint 2</i>)	Proportional Relationships	Write an equation to represent a proportional relationship given a verbal description.	Identify or write an equation to represent a real-world or mathematical proportional relationship given a table or graph that includes the ordered pair that correlates to the constant of proportionality; OR draw graphs of proportional relationships given a table that includes the ordered pair that correlates to the constant of proportionality.	Write an equation to represent a real-world or mathematical proportional relationship given a table or graph with non-consecutive values or coordinates and does not include the ordered pair that correlates to the constant of proportionality; OR draw graphs to represent proportional relationships, given an equation, table, or verbal description where the constant of proportionality must be calculated.	Explain and interpret an equation that represents a proportional relationship to make predictions or draw conclusions.
8.AF.5 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. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations. (<i>Checkpoint 2</i>)	Linear Functions	Interpret the slope and y-intercept from a linear equation given in slope-intercept form ($y = mx + b$).	Classify given equations as linear or non-linear.	Compare functions in similar and different representations using properties of functions to determine if they are linear or nonlinear.	Interpret and explain characteristics of linear functions as they apply to real-world situations.
8.AF.6 Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Within the context of a problem, describe the meaning of m (rate of change) and b (y-intercept) in $y = mx + b$. (E) (<i>Checkpoint 2</i>)	Linear Functions	Determine the rate of change or y-intercept of a linear function represented by a table, graph, or verbal description.	Identify an equation of a linear function represented by a table, graph, or verbal description.	Construct a linear function when given a verbal description, table, or graph, and interpret the rate of change or y-intercept of a linear function in terms of the situation it models. Graph a linear equation presented in	Interpret how the values of the two quantities change together within a given linear function in context. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

				slope-intercept form.	
8.AF.7 Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed). (Checkpoint 2)	Linear Functions	Given a linear function, identify an equivalent function in a different form.	Compare properties of two functions each represented in the same way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Create a different representation of a linear function that has a greater or lesser slope and y-intercept.
Concept continues in several Algebra I standards.					

Algebra and Functions					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
Concept begins in grade six.					
6.AF.1 Define and use multiple variables when writing expressions to represent real-world and other mathematical problems, and evaluate them for given values. (E) (Checkpoint 2)	Expressions and Data Analysis	Define and use expressions with one variable and one operation to represent a given verbal description.	Define and use expressions with one variable to represent a given real-world situation. Evaluate the expression for a given specific value.	Define and use expressions with two variables to represent real-world and mathematical problems. Evaluate the expression for a given specific value.	Solve real-world problems by substituting given values for multiple variables in a given expression.
Concept supports several subsequent grade level concepts.					
Standard	Reporting Category:	Below	Approaching	At	Above



	Subdomain				
<i>Concept begins in grade six.</i>					
6.AF.2 Demonstrate 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. (E) (<i>Checkpoint 2</i>)	Equations and Inequalities	Use substitution to determine whether a given value for a variable is a solution to an equation.	Use substitution to determine whether a given value for a variable is a solution to an inequality.	Use substitution to determine which number(s) from a given specific set make an equation or inequality true.	Solve real-world problems by determining which number(s) from a given specific set make an equation or inequality true.
<i>Concept supports several subsequent grade level concepts.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade six.</i>					
6.AF.3 Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p , q and x are all nonnegative rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E) (<i>Checkpoint 2</i>)	Equations and Inequalities	Represent a real-world problem using equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p , q and x are all nonnegative rational numbers.	Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p , q and x are all nonnegative rational numbers.	Solve a real-world problem using equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p , q and x are all nonnegative rational numbers.	Represent and solve a real-world problem using equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ for cases in which p , q and x are all nonnegative rational numbers. Describe the solution in the context of the problem.
7.AF.3 Solve equations of the form $px + q = r$ and $p(x + q) = r$ fluently, where p , q , and r are specific rational numbers.	Expressions, Equations, and Inequalities	Identify numbers as solutions to linear equations of the form $px + q = r$ and $p(x + q) = r$,	Solve equations of the form $px + q = r$ and $p(x + q) = r$ fluently, where p , q , and r are specific rational	Represent and solve real-world problems leading to equations of the form $px + q = r$ and p	Represent a real-world problem using more than one equation that simplifies to the form $px +$



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Represent real-world problems using equations of these forms and solve such problems. (E) (Checkpoint 3)		where p, q, and r are specific rational numbers.	numbers; OR identify linear equations that represent a real-world problem.	$(x + q) = r$ where p, q, and r are rational numbers.	$q = r$ and $p(x + q) = r$ where p, q and r are rational numbers. Explain whether a solution to a given problem is reasonable. Compare an algebraic solution to an arithmetic solution, analyzing the sequence of the operations used in each approach.
6.AF.4 Write an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a rational number, to represent a constraint or condition in a real-world or other mathematical problem. Explain that inequalities have infinitely many solutions and how to represent solutions on a number line diagram. (Checkpoint 2)	Equations and Inequalities	Match an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to a solution graphed on a number line.	Write inequalities of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to represent a mathematical or real-world problem with a constraint or condition.	Write inequalities of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$ to represent a real-world situation with a constraint or condition, and graph the solutions on a number line.	Given two constraints or conditions within a real-world problem, identify or write a pair of inequalities to represent each. Explain each inequality within the context of the problem.
7.AF.4 Solve inequalities of the form $px + q (> \text{ or } \geq) r$ or $px + q (< \text{ or } \leq) r$, where p, q, and r are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such problems. Graph the solution set of the inequality and interpret it in the context of the problem. (Checkpoint 3)	Expressions, Equations, and Inequalities	Solve inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers: OR identify the correct graph of the solution to a given inequality.	Solve inequalities of the form $px + q \geq r$ or $px + q \leq r$, where p, q, and r are specific rational numbers: OR construct the correct graph of the solution to a given inequality. Determine if given rational numbers are in the solution set of an inequality.	Solve real-world problems involving inequalities of the form $px + q (> \text{ or } \geq) r$ or $px + q (< \text{ or } \leq) r$, where p, q, and r are rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.	Critique a solution to a real-world problem for accuracy or reasonableness and justify arguments by applying understanding of inequalities.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

8.AF.2 Generate linear equations in one variable with one solution, infinitely many solutions, or no solutions. Justify the classification given. (Checkpoint 1)	Linear Equations and Inequalities	Classify one equation as having one solution, infinitely many solutions, or no solutions when given a linear equation and its solution.	Classify one or more linear equations as having one solution, infinitely many solutions, or no solutions when given equations that do not require simplification.	Generate a linear equation that has one solution, infinitely many solutions, or no solutions OR classify one or more linear equations that require simplification on one or both sides of the equation as having one solution, infinitely many solutions, or no solutions.	Analyze and justify a claim about the number of solutions to a multi-step linear equation.
8.AF.1 Solve linear equations and inequalities with rational number coefficients fluently, including those whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems. (E) (Checkpoint 1)	Linear Equations and Inequalities	Determine whether a given number is a solution to a linear equation or inequality.	Solve linear equations and inequalities in one variable with rational number coefficients, including solutions that require expanding expressions using the distributive property and collecting like terms on one side of the equation or inequality.	Create and solve linear equations and inequalities in one variable with rational number coefficients, including solutions that require expanding expressions using the distributive property and collecting like terms to solve real-world problems.	Use complex linear equations and equalities to solve real-world problems and justify solutions.
Concept continues in A.I.L.1 and A.I.L.2.					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
Concept directly aligns back to 5.CA.11.					
6.AF.5 Solve real-world and	Solving	Identify the parts of a coordinate plane and plot	Calculate distance between two points to	Solve real-world and mathematical problems	Solve real-world problems by determining



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E) <i>(Summative Only)</i>	Problems	given points within the four quadrants or on the x- and y-axes.	solve mathematical problems; OR represent the distance between two points on a coordinate plane using an expression, including absolute value symbols when necessary.	using order pairs or coordinates plotted on a coordinate plane.	multiple points that are a given distance away from an original point.
7.AF.5 Define slope as vertical change for each unit of horizontal change, and apply that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change. <i>(Checkpoint 2)</i>	Slope	Analyze and classify graphs or tables as representing a constant or variable rate of change without computation. Interpret the meaning of slope as the amount of vertical change for each horizontal change.	Analyze given situations to identify those that represent a constant rate of change modeled by a linear function or a varying rate of change.	Analyze situations in context to determine if they model constant or varying rates of change resulting in linear or nonlinear functions and use reasoning about slope, rates of change, and linear functions to justify responses.	Analyze the rate of change from a given situation or graph, including zero change. Interpret, explain, and/or compare various situations to determine if they can be modeled by a linear function.
8.AF.3 Understand that a function assigns to each x-value (independent variable) exactly one y-value (dependent variable), and that the graph of a function is the set of ordered pairs (x,y). <i>(Checkpoint 2)</i>	Functions	Identify the independent and dependent variables given a table, graph, or set of ordered pairs.	Define the meaning of a function, OR Identify characteristics of a function using a set of ordered pairs.	Apply understanding of functions to determine if a relation is a function or nonfunction.	Explain whether a given representation of a relation in a real-world situation is a function or is not a function, OR Critique an explanation determining if a relation in any form is a function.
Concept continues in several Algebra I standards.					
Standard	Reporting	Below	Approaching	At	Above



	Category: Subdomain				
<i>Concept directly aligns back to 5.CA.11.</i>					
6.AF.5 Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E) (<i>Summative Only</i>)	Solving Problems	Identify the parts of a coordinate plane and plot given points within the four quadrants or on the x- and y-axes.	Calculate distance between two points to solve mathematical problems; OR represent the distance between two points on a coordinate plane using an expression, including absolute value symbols when necessary.	Solve real-world and mathematical problems using order pairs or coordinates plotted on a coordinate plane.	Solve real-world problems by determining multiple points that are a given distance away from an original point.
7.AF.6 Graph a line given its slope and a point on the line. Find the slope of a line given its graph. (E) (<i>Checkpoint 2</i>)	Slope	Determine if the slope of a given graph is positive, negative, 0, or undefined.	Find the slope of a line given its graph.	Graph a line given its slope and a point on the line.	Determine the slope of a line in the context of a real-world situation. Identify additional points on a line when given the slope and one point.
8.AF.4 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described. (E)	Functions	Identify a qualitative description given a graph, or a graph given a qualitative description, with no context.	Identify a qualitative description given a graph, or a graph given a qualitative description, within a context.	Construct the graph of a function that matches a given qualitative description.	Use knowledge of qualitative descriptions to interpret and draw conclusions about given graphs within context, OR Sketch a graph of a function given qualitative data in the form of real-world data in context.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

(Checkpoint 2)					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.CA.11.</i>					
6.AF.5 Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E) (<i>Summative Only</i>)	Solving Problems	Identify the parts of a coordinate plane and plot given points within the four quadrants or on the x- and y-axes.	Calculate distance between two points to solve mathematical problems; OR represent the distance between two points on a coordinate plane using an expression, including absolute value symbols when necessary.	Solve real-world and mathematical problems using order pairs or coordinates plotted on a coordinate plane.	Solve real-world problems by determining multiple points that are a given distance away from an original point.
7.RP.3 Represent real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent these proportional relationships. Apply the definition of unit rate to $y = mx$. (E) (<i>Checkpoint 2</i>)	Proportional Relationships	Write an equation to represent a proportional relationship given a verbal description.	Identify or write an equation to represent a real-world or mathematical proportional relationship given a table or graph that includes the ordered pair that correlates to the constant of proportionality; OR draw graphs of proportional relationships given a table that includes the ordered pair that correlates to the constant	Write an equation to represent a real-world or mathematical proportional relationship given a table or graph with non-consecutive values or coordinates and does not include the ordered pair that correlates to the constant of proportionality; OR draw graphs to represent proportional relationships, given an equation, table, or verbal description	Explain and interpret an equation that represents a proportional relationship to make predictions or draw conclusions.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

			of proportionality.	where the constant of proportionality must be calculated.	
8.AF.5 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. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations. (<i>Checkpoint 2</i>)	Linear Functions	Interpret the slope and y-intercept from a linear equation given in slope-intercept form ($y = mx + b$).	Classify given equations as linear or non-linear.	Compare functions in similar and different representations using properties of functions to determine if they are linear or nonlinear.	Interpret and explain characteristics of linear functions as they apply to real-world situations.
8.AF.6 Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Within the context of a problem, describe the meaning of m (rate of change) and b (y-intercept) in $y = mx + b$. (E) (<i>Checkpoint 2</i>)	Linear Functions	Determine the rate of change or y-intercept of a linear function represented by a table, graph, or verbal description.	Identify an equation of a linear function represented by a table, graph, or verbal description.	Construct a linear function when given a verbal description, table, or graph, and interpret the rate of change or y-intercept of a linear function in terms of the situation it models. Graph a linear equation presented in slope-intercept form.	Interpret how the values of the two quantities change together within a given linear function in context. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values.
8.AF.7 Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to	Linear Functions	Given a linear function, identify an equivalent function in a different form.	Compare properties of two functions each represented in the same way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Create a different representation of a linear function that has a greater or lesser slope and y-intercept.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

determine which of two moving objects has greater speed). (Checkpoint 2)					
<i>Concept continues in several Algebra I standards.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>This concept begins in grade eight.</i>					
8.AF.8 Approximate the solution of a system of equations by graphing and interpreting the reasonableness of the approximation. (E) (Checkpoint 2)	Linear Functions	Determine the number of solutions a system has when given a system of equations represented graphically.	Determine or approximate the solution to a system of equations when given a system of equations represented graphically.	Graph a system of equations and determine (or approximate) the solution.	Interpret or solve real-world problems by estimating solutions to systems of equations.
<i>Concept continues in AI.SEI.2.</i>					

Geometry and Measurement					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.M.1.</i>					
6.GM.1 Convert between measurement systems (Customary to metric and metric to Customary) given the conversion factors, and use these conversions in solving real-world problems.	Working with Rates and Ratios	Identify an expression that can be used to find an equivalent measure in a different measurement system.	Convert between different measurement systems in a mathematical context.	Solve real-world problems involving converting units between measurement systems.	Solve multi-step, real world problems involving unit conversions between measurement systems.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

<i>(Checkpoint 3)</i>					
7.GM.1 Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning. <i>(Checkpoint 2)</i>	Proportional Relationships	Identify the scale factor of a smaller figure to a larger figure when given scale drawings of geometric figures.	Solve problems using a scale drawing of a geometric figure given the scale factor.	Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. Justify scale drawings using proportional reasoning.	Solve problems that involve applying multiple scale factors and justify scale drawings using proportional reasoning.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.G.1.</i>					
6.GM.2 Apply the sums of interior angles of triangles and quadrilaterals to solve real-world and mathematical problems. <i>(Summative Only)</i>		Identify that the sum of interior angle measures in a triangle is 180 degrees and the sum of interior angle measures in a quadrilateral is 360 degrees.	Calculate the missing angle measure in a triangle or quadrilateral when all other angle measures are given in a graphic.	Solve real-world and mathematical problems involving the sum of interior angle measures in triangles and quadrilaterals.	Solve real-world and mathematical problems involving the sum of interior angle measures in compound figures that are composed of triangles and quadrilaterals.
<i>Concept ends in grade six.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.M.2 and 5.M.3.</i>					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

6.GM.3 Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems. <i>(Summative Only)</i>	Solving Problems	Calculate the area of a complex shape composed of two simple polygons; OR calculate the area of one polygon within a complex shape composed of two simple polygons.	Calculate the area of a complex shape composed of three or more simple polygons; OR calculate the area of one polygon within a complex shape composed of three or more simple polygons.	Solve real-world problems by calculating the area of complex shapes composed of polygons by decomposing them into simple shapes.	Solve real-world problems by constructing complex shapes composed of simple polygons when given the area of the whole shape.
7.GM.2 Understand the formulas for area and circumference of a circle and use them to solve real-world and other mathematical problems; give an informal derivation of the relationship between circumference and area of a circle. <i>(Checkpoint 3)</i>	Geometry	Calculate the area or circumference of a circle, given the radius or diameter.	Calculate the radius, diameter, or area of a circle when given the circumference; OR calculate the radius, diameter, or circumference of a circle when given the area of a circle in terms of π .	Apply the formulas for the area and circumference of a circle to solve problems.	Apply knowledge of the area and circumference of a circle or the informal derivation of the relationship between the two to solve complex problems.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.M.4 and 5.M.5.</i>					
6.GM.4 Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and	Solving Problems	Calculate the volume of a rectangular prism packed with fractional edge lengths.	Calculate the volume of a rectangular prism packed with unit cubes with fractional edge lengths.	Calculate the volume of rectangular prisms with fractional edge lengths to solve real-world and mathematical problems.	Calculate the missing edge length of a rectangular prism given two edge lengths with fractional values and volume; OR calculate the edge lengths (and volume) of a rectangular prism given the number of unit cubes packed in the prism and their



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

V = Bh to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E) (<i>Summative Only</i>)					fractional edge length.
7.GM.3 Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms. (E) (<i>Checkpoint 3</i>)	Geometry	Calculate the volume of cylinders and three-dimensional objects composed of right rectangular prisms in a mathematical problem.	Calculate the height or radius of a cylinder when given the volume of the cylinder and one other measurement; OR calculate a missing side length of a three-dimensional object composed of right rectangular prisms.	Solve real-world and other mathematical problems involving finding the volume of cylinders and three-dimensional objects composed of right rectangular prisms.	Solve real-world and other mathematical problems involving calculating the height or or radius of a cylinder or calculating a missing side length of a three-dimensional object composed of right rectangular prisms.
8.GM.2 Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres. (E) (<i>Checkpoint 3</i>)	Geometry	Calculate the volume of cones, spheres, and pyramids and the surface area of spheres in a mathematical problem.	Calculate missing dimensions of cones and pyramids using the formulas for volume or surface area.	Solve real-world problems by applying the formulas for the volume of cones, spheres, or pyramids or the surface area of a sphere.	Apply the volume formulas of cones, spheres, and pyramids to solve real-world and mathematical problems in which the volume of one shape must be used to determine the volume of another shape. Apply the surface area formula of a sphere to find the volume of the sphere.
Concept continues in G.TS.4.					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
Concept begins in grade eight.					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

8.GM.1 Explore dilations, translations, rotations, and reflections on two-dimensional figures in the coordinate plane. (E) (<i>Checkpoint 3</i>)	Geometry	Identify the type of transformation used to create a similar figure on a given coordinate plane.	Identify the coordinates of a point or the specific transformation of an image after a transformation is performed.	Perform a single transformation (dilation, translation, rotation, or reflection) on a coordinate plane using given information and determine the coordinates of the new figure.	Perform a multi-step transformation using a combination of dilations, translations, rotations, and reflections on a coordinate plane; OR analyze the new figure to determine the effects of the transformation on the attributes of the figure.
<i>Concept continues in G.TS.1 and G.TS.2</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade eight.</i>					
8.GM.3 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions. (E) (<i>Checkpoint 3</i>)	Geometry	Identify or write the Pythagorean Theorem for a given triangle.	Apply the Pythagorean Theorem to find the hypotenuse of a right triangle in real-world or other mathematical problems in two dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths of right triangles to solve real-world problems.	Apply the Pythagorean Theorem to solve real-world and mathematical problems involving two- and three-dimensional shapes composed of at least one right triangle.
<i>Concept continues in G.T.5 and G.T.7.</i>					

Data Analysis, Statistics, and Probability					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.DA.1.</i>					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

6.DS.1 Select, create, and interpret graphical representations of numerical data, including line plots, histograms, and box plots. <i>(Checkpoint 2)</i>	Expressions and Data Analysis	Identify an appropriate display for numerical data including histograms, line plots, and box plots.	Construct an appropriate display for numerical data including histograms, line plots, and box plots.	Interpret numerical data displayed in histograms, line plots, and box plots.	Draw conclusions or make claims about the data represented within histograms, line plots, or box plots. Use data from the graph to support the conclusion or claim.
7.DSP.3 Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median. <i>(Summative Only)</i>	Solving Problems	Classify the visual overlap of two data sets as full, partial, or no overlap; OR identify sets of data that have the most overlap.	Analyze and make observations about the degree of visual overlap of two data sets represented as box plots using measures of center (mean and median) and spread (range, interquartile range, and mean absolute deviation).	Analyze and make observations about the degree of visual overlap of two data sets represented as line plots using measures of center (mean and median) and spread (range, interquartile range, and mean absolute deviation); OR describe how additional data points, including outliers, may affect the mean and/or median of a data set.	Make, justify, and critique comparative inferences about two populations based on the overlap of two numerical data distributions represented in line plots or box plots.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.DA.1.</i>					
6.DS.2 Formulate statistical questions, collect and organize the data (e.g., using technology), and display and interpret the data with graphical representations (e.g., using technology). (E) <i>(Summative)</i>	Expressions and Data Analysis	Define characteristics of a statistical question; OR distinguish between statistical and non-statistical questions; OR write statistical questions based on given	Identify appropriate methods for data collection; OR collect and organize data into tables or frequency charts.	Identify the best graphical representation for data: OR identify trends or patterns in graphical representations of data sets.	Analyze graphical representations of data to answer statistical questions, draw conclusions, and provide reasoning for solutions.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Only)		information.			
7.DSP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population. Understand that conclusions and generalizations about a population from a sample are valid only if the sample is representative of that population and that random sampling tends to produce representative samples and support valid inferences. (E) <i>(Summative Only)</i>	Solving Problems	Identify appropriate sampling that can be used to gain information about a population.	Identify whether a sampling method would be likely to produce a sample representative of a population; OR identify whether a sampling method is random or non-random.	Recognize whether a conclusion or generalization of a population based on a sample is valid based on the sampling method used.	Justify why a conclusion or generalization of a population based on a sample is or is not valid based on the sampling method used; OR Given a statistical question, design a sampling method that would be likely to produce a representative sample.
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept directly aligns back to 5.DA.2.</i>					
6.DS.3 Summarize numerical data sets in relation to their context in multiple ways, such as: - Report the number of observations; - Describe the nature of the attribute under investigation, including how it was measured and its units of measurement; - Determine quantitative measures of center	Expressions and Data Analysis	Given a numerical data set: - Determine the mean, median, and range of the set. - Identify the best measure of center (mean or median)	Given a data set displayed in a histogram, line plot, or box plot, summarize the data in relation to their context by: - Determining the total number of observations or data points on a line graph or histogram; - Determining the values between each interval of a	Given a set of data displayed in a histogram, line plot, or box plot, summarize the data in relation to their context by: - Describing the overall distribution patterns, including clusters, peaks, gaps, and outliers; - Describing how the mean and median are affected by	Explain how a measure of center or measure of spread will or will not change when an additional data point is included in the data set. Create or complete data sets for given attributes and information about spread of data and/or measure of center.



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

(mean and/or median) and spread (range and interquartile range); d. Describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered; and e. Relate the choice of measures of center and spread to the shape of the data distribution and the context in which the data were gathered. (E) <i>(Checkpoint 2)</i>			histogram; - Determining the attribute under investigation and identify its units of measurement; - Identifying and calculating the best measure of center (mean or median); and, - Identifying and calculating the best measure of spread (range or interquartile range).	different outliers in a real-world situation; Using measures of center and spread to draw conclusions about data sets and make predictions based on comparisons.	
7.DSP.2 Find, use, and interpret measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations. (E) <i>(Summative Only)</i>	Solving Problems	Calculate the mean, median, and range of numerical data from two random samples of populations to make comparisons.	Calculate the interquartile range and mean absolute deviation of numerical data from random samples of populations to make comparisons.	Make comparisons between two data sets from two populations using measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) in real-world contexts.	Make, justify, and critique comparative inferences about two populations based on the comparison and interpretation of measures of central tendency (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation).
<i>Concept ends in grade seven.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade seven.</i>					



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

7.DSP.4 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Understand that a probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Understand that a probability of 1 indicates an event certain to occur and a probability of 0 indicates an event impossible to occur. Identify probabilities of events as impossible, unlikely, equally likely, likely, or certain. (E) <i>(Summative Only)</i>	Solving Problems	Classify the likelihood of one event occurring as either impossible, unlikely, equally likely, likely, or certain based on a given probability of 0, $\frac{1}{2}$, or 1.	Classify the likelihood of each event from a given situation occurring as either impossible, unlikely, equally likely, likely, or certain.	Classify probabilities of events represented as fractions as impossible, unlikely, equally likely, likely, or certain.	Compare the likelihood of events given the probabilities of the events.
8.DSP.4 Define the probability of a compound event, just as with simple events, as the fraction of outcomes in the sample space for which the compound event occurs. Use appropriate terminology to describe independent, dependent, complementary, and mutually exclusive events. (E) <i>(Summative Only)</i>	Solving Problems	Given a description of an event, determine whether it is independent, dependent, complementary, or mutually exclusive.	Identify an expression that uses fractions to represent the outcome of a compound event.	Calculate the probability of an event given a description. Explain the probability of a given event in terms of a fraction of outcomes in the sample space.	Analyze an error made when calculating the probability of a compound event given a verbal description. Compare the probability of two or more events given a verbal description.
Concept continues in All.MDS.3.					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

Concept begins in grade seven.

7.DSP.5 Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies, evaluate the level of agreement, and explain possible sources of discrepancy. (E) (<i>Summative Only</i>)	Solving Problems	Represent the probability of an event in a sample space where n events are equally likely as $1/n$. Create a sample space for a simple experiment.	Represent the probability of an event as the ratio of the number of desired outcomes to the number of total outcomes in the sample space, given the sample space. Create a sample space, indicating the desired outcomes and total outcomes.	Represent the probability of an event as the ratio of the number of desired outcomes to the number of total outcomes in the sample space, given a description of the sample space. Create a probability model, given the sample space or a description of the sample space. Use a probability model to predict the approximate relative frequency of an event.	Compare probabilities of a probability model to observed frequencies and explain reasons for any differences between the two quantities.
8.DSP.3 Represent sample spaces and find probabilities of compound events (independent and dependent) using organized lists, tables, and tree diagrams. (E) (<i>Summative Only</i>)		Identify the correct sample space for a given compound event.	Calculate the probability of a compound, independent event using any strategy; OR identify an outcome missing from a sample space of a given compound event.	Calculate the probability of a compound, dependent event using any strategy.	Find the probability of a compound event that consists of an independent event and dependent event.
8.DSP.5 For events with a large number of outcomes, understand the use of the multiplication counting principle. Develop the multiplication counting principle and apply it to situations with a large number of outcomes. (<i>Summative Only</i>)		Demonstrate how the multiplication counting principle can be used to find the same number of outcomes as a listing method.	Identify or write expressions to represent the application of the multiplication counting principle to small-scale situations; OR solve small-scale problems by applying the multiplication counting principle.	Solve large-scale problems by applying the multiplication counting principle.	Solve problems that include constraints on order or repetition by applying the multiplication counting principle.
<i>Concept continues in All.MQ.1.</i>					
Standard	Reporting	Below	Approaching	At	Above



Summative Proficiency Level Descriptors: Mathematics (Grades 6-8)

	Category: Subdomain				
<i>Concept begins in grade eight.</i>					
8.DSP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantitative variables. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. (Checkpoint 3)	Functions	Accurately identify positive, negative, or no association between two quantities using a scatter plot.	Identify more than one characteristic of a data set, such as outliers, positive or negative association, linear association, and nonlinear association.	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, AND describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Analyze patterns of association between two quantities and use data to critique responses; OR create a scatter plot to represent given descriptors.
<i>Concepts continue in AI.DS.3 and AI.DS.4.</i>					
Standard	Reporting Category: Subdomain	Below	Approaching	At	Above
<i>Concept begins in grade eight.</i>					
8.DSP.2 Write and use equations that model linear relationships to make predictions, including interpolation and extrapolation, in real-world situations involving bivariate measurement data. Interpret the slope and y-intercept in context. (E) (Checkpoint 3)	Functions	Interpret the slope and y-intercept of a line of best fit, with slope and/or intercept parameter identified, in terms of the context.	Interpret the slope and intercept of a modeling equation in terms of the context.	Solve problems about the slope and intercept of a line of best fit in terms of the context.	Justify the reasonableness of the predictions in the context of the bivariate measurement data.
<i>Concepts continue in AI.DS.3 and AI.DS.4.</i>					