

Grade 6 Math Pacing Guide 11-12

A= Standard should be taught and will be assessed on the Benchmark

X= Standard should be taught but will not be assessed on the Benchmark

Benchmark 1: August 22 - October 5		
Algebra and Functions (29% of the CST)		
1.4	Solve problems manually by using the correct order of operations or by using a scientific calculator. (1)	A
1.3	Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process. (1)	A
1.2	Write and evaluate an algebraic expression for a given situation, using up to three variables.(1)	A
1.1	Write and solve one-step linear equations in one variable. (6)	A
Number Sense (39% of the CST)		
2.3	Solve addition, subtraction, multiplication and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations. (3)	A
2.4	Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions. (3)	A
Benchmark 2: October 13 - December 7		
Number Sense (39% of the CST)		
1.1	Compare and order decimals, positive and negative fractions, and mixed numbers and place them on a number line. (6)	A
2.1	Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation. (1/2)	A
2.2	Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $5/8$ divided by $15/16 = 5/8 \times 16/15 = 2/3$).	A
Algebra and Functions (29% of the CST)		
2.1	Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches). (1)	A
Number Sense (39% of the CST)		
1.2	Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b , a to b , $a:b$). (1)	A
Algebra and Functions (29% of the CST)		
2.2	Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity. (6)	A
2.3	Solve problems involving rates, average speed, distance, and time. (1)	A
Number Sense (39% of the CST)		
1.3	Use proportions to solve problems (e.g., determine the value of N if $4/7 = N/21$). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse. (3) (<i>numerical relationships</i>)	A
1.4	Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. (5)	X
Benchmark 3: December 15 - February 8		
Number Sense (39% of the CST)		
1.3	Use proportions to solve problems (eg., find the length of a side of a polygon similar to a known polygon). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse. (3) (<i>geometric relationships</i>)	A
1.4	Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. (5)	A
Algebra and Functions (29% of the CST)		
3.1	Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = 1/2bh$, $C = \pi d$ - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively). (1)	A
3.2	Express in symbolic form simple relationships arising from geometry. (1)	A

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Measurement and Geometry (15% of the CST)		
1.1	Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle. (3)	A
1.2	Know common estimates of π (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements. (1/2)	A
2.1	Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. (1)	A
2.2	Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle. (4)	A
2.3	Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle). (1)	A
Benchmark 4: February 16 - April 2		
Statistics, Data Analysis, and Probability (17% of the CST)		
1.1	Compute the range, mean, median, and mode of data sets. (1/3)	A
1.2	Understand how additional data added to data sets may affect these computations of measures of central tendency. (1/3)	A
1.3	Understand how the inclusion or exclusion of outliers affects measures of central tendency. (1/3)	A
2.5	Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims. (1/3)	A
2.2	Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population. (3)	A
3.3	Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, $1 - P$ is the probability of an event not occurring. (3)	A
3.1	Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. (3)	A
Measurement and Geometry (15% of the CST)		
1.3	Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid. (1/2)	A
Mathematical Reasoning (Embedded)		
1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	X
2.1	Use estimation to verify the reasonableness of calculated results.	X
2.4	Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	X
3.3	Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.	X

Numbers after standards represent the number of items on the CST.

Fractions indicate rotated standards. (1/2= rotated every two years)

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Benchmark 1: August 22 - October 5		
Algebra and Functions (29% of the CST)		
1.4	Solve problems manually by using the correct order of operations or by using a scientific calculator. (1)	A
7-1.3	Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, communitive) and justify the process used.(5)	X
1.3	Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process. (1)	A
1.2	Write and evaluate an algebraic expression for a given situation, using up to three variables.(1)	A
1.1	Write and solve one-step linear equations in one variable. (6)	A
7-4.1a	Solve two-step linear equations in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the resaonableness of the results. (5)	X
7-1.1a	Use variables and appropriate operations to write an expressions.	X
Number Sense (39% of the CST)		
7-1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (1)	X
7-1.2b	Take positive rational numbers to whole-number powers. (4)	X
7-2.5	Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers. (2)	X
2.3	Solve addition, subtraction, multiplication and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations. (3)	A
7-1.2a	Add, subtract, multiply and divide rational numbers (integers).	X
2.4	Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions. (3)	A
7-2.1	Understand negative whole-number exponents. <Multiply and divide expressions involving exponents with a common base.> (1)	X
Benchmark 2: October 13 - December 7		
Number Sense (39% of the CST)		
1.1	Compare and order decimals, positive and negative fractions, and mixed numbers and place them on a number line. (6)	A
7-1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (1)	X
2.1	Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation. (1/2)	A
7-1.2b	Add, subtract, multiply and divide rational numbers (fractions and decimals).	X
2.2	Explain the meaning of multiplication and division problems, including those arising in concrete situations, that use positive integers. (6)	A
Algebra and Functions (29% of the CST)		
2.1	Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches). (1)	A
Number Sense (39% of the CST)		
1.2	Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b , a to b , $a:b$). (1)	A

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Algebra and Functions (29% of the CST)		
2.2	Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity. (6)	A
2.3	Solve problems involving rates, average speed, distance, and time. (1)	A
7-SDAP 1.1	Know various forms of display for data sets, including <a stem-and-leaf plot> or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data. (1)	X
7-AF1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. (2/3)	X
7-4.2	Solve multi-step problems involving rate, average speed, distance and time or a direct variation.(5)	X
Number Sense (39% of the CST)		
1.3	Use proportions to solve problems (e.g., determine the value of N if $4/7 = N/21$). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse. (3) (<i>numerical relationships</i>)	A
7-1.6	Calculate the percentage increase and decrease of a quantity.(1)	X
1.4	Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. (5)	X
Benchmark 3: December 15 - February 8		
Number Sense (39% of the CST)		
1.3	Use proportions to solve problems (eg., find the length of a side of a polygon similar to a known polygon). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse. (3) (<i>geometric relationships</i>)	A
1.4	Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips. (5)	A
7.1.7	Solve problems that involve discounts,comissions and profit and compute simple interest. (Do not expose to markups or compound interest.)	X
Algebra and Functions (29% of the CST)		
3.1	Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = 1/2bh$, $C = \pi d$ - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively). (1)	A
3.2	Express in symbolic form simple relationships arising from geometry. (1)	A
Measurement and Geometry (15% of the CST)		
1.1	Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle. (3)	A
1.2	Know common estimates of π (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements. (1/2)	A
2.1	Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. (1)	A
2.2	Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle. (4)	A
7-3.3a	Know and understand the Pythagorean theorem and use it to find the length of the missing side of a right triangle.	X
2.3	Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle). (1)	A
1.3	Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid. (1/2)	A

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Benchmark 4: February 15 -April 2		
Statistics, Data Analysis, and Probability (17% of the CST)		
1.1	Compute the range, mean, median, and mode of data sets. (1/3)	A
1.2	Understand how additional data added to data sets may affect these computations of measures of central tendency. (1/3)	A
1.3	Understand how the inclusion or exclusion of outliers affects measures of central tendency. (1/3)	A
2.5	Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims. (1/3)	A
2.2	Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population. (3)	A
3.3	Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, $1 - P$ is the probability of an event not occurring. (3)	A
3.1	Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. (3)	A
3.4	Understand that the probability of either of two disjoint events occurring is the sum of the two individual probabilities and that the probability of one event following another, in independent trials, is the product of the two probabilities. (1/3)	A
3.5	Understand the difference between independent and dependent events. (1/3)	A
Post Benchmark: April 5- June 11		
Number Sense		
7-1.4	Differentiate between rational and irrational numbers. (1)	X
7-1.5	Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions. (1)	X
Algebra and Functions		
7-1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. (2/3)	X
7-3.3	Graph linear functions, noting that the vertical change (change in y - value) per unit of horizontal change (change in x -value) is always the same and know that the ratio ("rise over run") is called the slope of a graph. (2)	X
7-3.4	Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities. (2)	X
Mathematical Reasoning (Embedded)		
1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	X
2.1	Use estimation to verify the reasonableness of calculated results.	X
2.4	Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.	X
3.3	Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.	X

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Mathematical Reasoning (Embedded)		
MR 1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	E
MR 1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	E
MR 2.1	Use estimation to verify the reasonableness of calculated results.	E
MR 2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	E
MR 3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	E
BENCHMARK 1- August 22-October 5		
Number Sense (34% of the CST)		
NS 2.5	Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers. (2)	A
NS 1.2a	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals). (4)	A
NS 2.2	Add and subtract fractions by using factoring to find common denominators. (2)	A
Algebra and Functions (38% of the CST)		
AF 1.1a	Use variables and appropriate operations to write an expression. (1)	A
AF 1.1b	Use variables and appropriate operations to write an equation. (1)	A
AF 1.3	Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used. (5)	A
Measurement and Geometry (20% of the CST)		
MG 1.2	Construct and read drawings and models made to scale. (1/3)	A
MG 2.1a	Use formulas routinely for finding the perimeter and area of basic two-dimensional figures including rectangles, parallelograms, trapezoids, squares, triangles. (1/3)	A
MG 2.2a	Estimate and compute the area of more complex or irregular two-dimensional figures by breaking the figures down into more basic geometric objects. (1/3)	A
Number Sense (34% of the CST)		
NS 1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (1)	A
NS 1.5a	Convert terminating decimals into reduced fractions. (1)	A
NS 1.6	Calculate the percentage of increases and decreases of a quantity. (1)	A
BENCHMARK 2- October 13- December 7		
Number Sense (34% of the CST)		
NS 1.2b	Take positive rational numbers to whole-number powers. (4)	A
NS 2.1	Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base. (1)	A
Algebra and Functions (38% of the CST)		
AF 2.1	Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents. (1)	A
Number Sense (34% of the CST)		
NS 2.3	Multiply, divide, and simplify rational numbers by using exponent rules. (3)	A
NS 1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (1)	A
Measurement and Geometry (20% of the CST)		
MG 3.3	Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement. (4)	A
Number Sense (34% of the CST)		
NS 1.5b	Know that every rational number is either a terminating or repeating decimal. (1)	A
NS 1.4	Differentiate between rational and irrational numbers. (1)	A
NS 2.4	Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why. (1)	A
BENCHMARK 3- December 15- February 8		
Number Sense (34% of the CST)		
NS 1.7	Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest. (5)	A
Algebra and Functions (38% of the CST)		
AF 1.2	Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$. (1)	A

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E = Standards should be embedded in all problem-solving throughout the year.

Mathematical Reasoning (Embedded)		
MR 1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	E
MR 1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	E
MR 2.1	Use estimation to verify the reasonableness of calculated results.	E
MR 2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	E
MR 3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	E
AF 2.2		
AF 2.2	Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent. (1)	A
AF 4.1a	Solve two-step linear equations in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results. (5)	A
AF 4.2	Solve multistep problems involving rate, average speed, distance, and time or a direct variation. (5)	A
Measurement and Geometry (20% of the CST)		
MG 1.1	Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters). (2/3)	X
MG 1.3	Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer. (3)	X
Algebra and Functions (38% of the CST)		
AF 1.1c	Use variables and appropriate operations to write system of equations. (1)	A
AF 1.1d	Use variables and appropriate operations to write a system of inequalities that represents a verbal description. (1)	A
AF 4.1b	Solve two-step linear inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results. (5)	A
BENCHMARK 4- February 16-April 2		
Algebra and Functions (38% of the CST)		
AF 1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. (2/3)	A
Statistics, Data Analysis, and Probability (8% of the CST)		
SDAP 1.2	Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). (1)	X
Algebra and Functions (38% of the CST)		
AF 3.3	Graph linear functions, noting that the vertical change (change in y - value) per unit of horizontal change (change in x - value) is always the same and know that the ratio ("rise over run") is called the slope of a graph. (2)	A
AF 3.4	Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities. (2)	A
AF 3.1	Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems. (2/3)	A
Measurement and Geometry (20% of the CST)		
MG 3.4	Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures. (2)	A
Post Benchmark IV/Pre-CST		
Measurement and Geometry (20% of the CST)		
MG 3.2	Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections. (1/3)	X
MG 2.1b	Use formulas routinely for finding the surface area and volume of basic three-dimensional figures, including prisms and cylinders. (1/3)	X
MG 3.6	Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect). (1)	X
Statistics, Data Analysis, and Probability (8% of the CST)		
SDAP 1.1	Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data. (1)	X
SDAP 1.3	Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and maximum of a data set. (3)	X

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E = Standards should be embedded in all problem-solving throughout the year.

BD	BD= Standards should be blended with similar 7th grade standard to build depth and rigor, but will not be assessed on the Benchmark (should be assessed with in-class assessments).	
Mathematical Reasoning (Embedded)		
MR 1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	E
MR 1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	E
MR 2.1	Use estimation to verify the reasonableness of calculated results.	E
MR 2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	E
MR 3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	E
BENCHMARK 1- August 22-October 5		
Number Sense (34% of the CST)		
NS 2.5	Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers. (2)	A
NS 1.2a	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals). (4)	A
NS 2.2	Add and subtract fractions by using factoring to find common denominators. (2)	A
Algebra and Functions (38% of the CST)		
AF 1.1a	Use variables and appropriate operations to write an expression. (1)	A
ALG 4.0	Students simplify expressions (Combining Like Terms). (3)	5
AF 1.1b	Use variables and appropriate operations to write an equation. (1)	A
AF 1.3	Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used. (5)	A
ALG1.1	Students use properties of numbers to demonstrate whether assertions are true or false. (1/2)	BD
Measurement and Geometry (20% of the CST)		
MG 1.2	Construct and read drawings and models made to scale. (1/3)	A
MG 2.1a	Use formulas routinely for finding the perimeter and area of basic two-dimensional figures including rectangles, parallelograms, trapezoids, squares, triangles. (1/3)	A
MG 2.2a	Estimate and compute the area of more complex or irregular two-dimensional figures by breaking the figures down into more basic geometric objects. (1/3)	A
Number Sense (34% of the CST)		
NS 1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (1)	A
NS 1.5a	Convert terminating decimals into reduced fractions. (1)	A
NS 1.6	Calculate the percentage of increases and decreases of a quantity. (1)	A
BENCHMARK 2- October 13- December 7		
Number Sense (34% of the CST)		
NS 1.2b	Take positive rational numbers to whole-number powers. (4)	A
NS 2.1	Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base. (1)	A
Algebra and Functions (38% of the CST)		
AF 2.1	Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents. (1)	A
Number Sense (34% of the CST)		
NS 2.3	Multiply, divide, and simplify rational numbers by using exponent rules. (3)	A
NS 1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (1)	A
Measurement and Geometry (20% of the CST)		
MG 3.3	Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement. (4)	A
Number Sense (34% of the CST)		
NS 1.5b	Know that every rational number is either a terminating or repeating decimal. (1)	A
NS 1.4	Differentiate between rational and irrational numbers. (1)	A
NS 2.4	Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why. (1)	A
ALG 2.0	Students understand and use such operations as talking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents (4)	BD

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X= Standard should be taught but will not be assessed until the CST

E = Standards should be embedded in all problem-solving throughout the year.

BD	BD= Standards should be blended with similar 7th grade standard to build depth and rigor, but will not be assessed on the Benchmark (should be assessed with in-class assessments).	
Mathematical Reasoning (Embedded)		
MR 1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	E
MR 1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	E
MR 2.1	Use estimation to verify the reasonableness of calculated results.	E
MR 2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	E
MR 3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	E
BENCHMARK 3- December 15- February 8		
Number Sense (34% of the CST)		
NS 1.7	Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest. (5)	A
Algebra and Functions (38% of the CST)		
AF 1.2	Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$. (1)	A
AF 2.2	Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent. (1)	A
AF 4.1a	Solve two-step linear equations in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results. (5)	A
ALG 5.0	<i>Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step. (6)</i>	BD
AF 4.2	Solve multistep problems involving rate, average speed, distance, and time or a direct variation. (5)	A
ALG 15.0	<i>Students apply algebraic techniques to solve rate problems and work problems</i>	BD
Measurement and Geometry (20% of the CST)		
MG 1.1	Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters). (2/3)	X
MG 1.3	Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer. (3)	X
Algebra and Functions (38% of the CST)		
AF 1.1c	Use variables and appropriate operations to write system of equations. (1)	A
AF 1.1d	Use variables and appropriate operations to write a system of inequalities that represents a verbal description. (1)	A
AF 4.1b	Solve two-step linear inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results. (5)	A

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Mathematical Reasoning (Embedded)		
MR 1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	E
MR 1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	E
MR 2.1	Use estimation to verify the reasonableness of calculated results.	E
MR 2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	E
MR 3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.	E
BENCHMARK 4- February 16-April 2		
Algebra and Functions (38% of the CST)		
AF 1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. (2/3)	A
Statistics, Data Analysis, and Probability (8% of the CST)		
SDAP 1.2	Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). (1)	X
Algebra and Functions (38% of the CST)		
AF 3.3	Graph linear functions, noting that the vertical change (change in y - value) per unit of horizontal change (change in x - value) is always the same and know that the ratio ("rise over run") is called the slope of a graph. (2)	A
AF 3.4	Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities. (2)	A
AF 3.1	Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems. (2/3)	A
ALG 6.0	<i>Students graph a linear equation and compute the x and y intercepts.</i>	BD
ALG 7.0	<i>Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations.</i>	BD
Measurement and Geometry (20% of the CST)		
MG 3.4	Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures. (2)	A
Post Benchmark IV/Pre-CST		
Measurement and Geometry (20% of the CST)		
MG 3.2	Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections. (1/3)	X
MG 2.1b	Use formulas routinely for finding the surface area and volume of basic three-dimensional figures, including prisms and cylinders. (1/3)	X
MG 3.6	Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect). (1)	X
Statistics, Data Analysis, and Probability (8% of the CST)		
SDAP 1.1	Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data. (1)	X
SDAP 1.3	Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and maximum of a data set. (3)	X
Algebra and Functions (38% of the CST)		
ALG 9.0	<i>Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically.</i>	BD
ALG 21.0	<i>Students graph quadratic functions and know that their roots are the x- intercepts.</i>	BD

Algebra 1 Pacing Guide 11-12

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Benchmark 1 (August 22-October 5)		
Justification and Reasoning (<i>italicized standards are embedded</i>)		
1.1	Students use properties of numbers to demonstrate whether assertions are true or false. (1/2)	A
25.1	<i>Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions. (1/2)</i>	X
25.3	<i>Given a simple algebraic statement students determine whether the statement is true sometimes, always, or never. (1/2)</i>	X
24.1	<i>Students explain the difference between inductive and deductive reasoning and identify and provide examples of each. (1/3)</i>	X
24.2	<i>Students identify the hypothesis and conclusion in logical deduction.</i>	X
24.3	<i>Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. (1/3)</i>	X
Linear Equations, Inequalities, and Absolute Value		
5.0	Students solve linear equations and inequalities in one variable and provide justification for each step, including word problems. (6)	A
3.0	Students solve equations and inequalities involving absolute value. (1)	A
Real Numbers (Integers and Fractions)		
2.0a	Students understand and use the rules of exponents. (4)	A
25.2	<i>Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step. (1/2)</i>	X
Polynomial Expressions		
4.0	Students simplify expressions (Combining Like Terms). (3)	A
10.0a	Students add, subtract monomials and polynomials. (4)	A
Benchmark 2 (October 13-December 7)		
Functions and Representations		
16.0	Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions. (1/2)	A
17.0	Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression (<i>limited to linear equations</i>). (1)	A
18.0	Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion. (1/2)	A
Linear Functions and Relations		
6.0	Students graph a linear equation and compute the x - and y - intercepts (e.g., graph $2x + 6y = 4$). (4) Students are able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$). (4)	A
7.0	Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula. (4)	A
8.0	Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point. (1)	A

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Benchmark 3 (December 15-February 8)		
Linear Functions and Relations		
15.0	Students apply algebraic techniques to solve work, rate, coin, and percent mixture problems. (4)	X
9.0	Students are able to solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets. (5)	A
Real Numbers (Integers and Fractions)		
2.0b	Students understand raising to a fractional power. (4)	A
Polynomial Expressions		
10.0b	Students multiply monomials and polynomials. (4)	A
Quadratic Functions		
11.0	Students apply basic factoring techniques to second-and simple third-degree polynomials(Find GCF of cubic). These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. (2)	A
14.0	Students solve a quadratic equation by factoring and completing the square. (3)	A
22.0 a	Students use factoring to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points. (1)	A
21.0	Students graph quadratic functions and know that their roots are the x- intercepts. (3)	A
22.0 a	Students use factoring techniques to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.(1)	A
14.0	Students solve a quadratic equation by factoring and completing the square (3)	A
Benchmark 4 (February 16-April 2)		
Quadratic Functions		
19.0	Students know the quadratic formula and are familiar with its proof by completing the square. (2)	A
23.0	Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity. (3)	A
22.0 b	Students use the quadratic formula to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points. (1)	A
20.0	Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations. (3)	A
Real Numbers (Integers and Fractions)		
2.0b	Students understand raising to a fractional power. (4)	A
Rational Expressions		
12.0	Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms. (3)	A
15.0	Students apply algebraic techniques to solve <i>word problems</i> , work, rate, coin, and percent mixture problems. (4)	A
13.0	Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques. (4)	A
11.0	Students apply basic factoring techniques to second-and simple third-degree polynomials. (Find GCF of cubic). These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. (2)	X
10.0	Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques. (4)	A

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(1/2= rotated every two years)

Geometry Pacing Guide 11-12

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Benchmark 1 (August 22-October 5)		
Angle Relationships, Constructions, and Lines (25%)		
16.0	Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off of the line. (4)	A
17.0	Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles. (3)	Intro
Logic and Geometric Proofs (35%)		
1.0	Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning. (2)	A
2.0	Students write geometric proofs, including proofs by contradiction. (3)	A
3.0	Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement. (4)	A
4.0	Students prove basic theorems involving congruence and similarity (5).	Intro
7.0 a	Students prove and use theorems involving properties of parallel lines cut by a transversal (5 2/3)	A
Benchmark 2 (October 13-December 7)		
Logic and Geometric Proofs (35%)		
4.0	Students prove basic theorems involving congruence and similarity (5).	A
5.0	Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles. (2)	A
6.0	Students know and are able to use the triangle inequality theorem. (1)	X
7.0 b	Students prove and use theorems involving properties of quadrilaterals. (5 2/3)	A
Volume and Area Formulas (17%)		
10.0	Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.	A
Angle Relationships, Constructions, and Lines (25%)		
12.0	Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.(5)	A
13.0	Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles. (2)	X
17.0	Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles. (3)	A
Benchmark 3 (December 15-February 8)		
Logic and Geometric Proofs (35%)		
7.0 c	Students prove and use theorems involving properties of circles. (5 2/3)	A
Volume and Area Formulas (17%)		
8.0 a	Students know, derive, and solve problems involving perimeter, circumference, area (4).	A
11.0	Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids (1).	A
Trigonometry (23%)		
20.0	Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles and 45°, 45°, and 90° triangles. (1)	X
21.0	Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles (5).	A
Angle Relationships, Constructions, and Lines (25%)		
14.0	Students prove the Pythagorean theorem (1/3).	X

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Benchmark 4 (February 16-April 2)		
Volume and Area Formulas (17%)		
8.0 b	Students know, derive, and solve problems involving volume, lateral area, and surface area of common geometric figures (4).	A
9.0	Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders. (2)	A
Angle Relationships, Constructions, and Lines (25%)		
15.0	Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.	A
Trigonometry (23%)		
18.0	Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$. (3)	A
19.0	Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side. (3)	A
22.0	Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections. (3)	A

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