Algebra Readiness Curriculum Sequence

Mathematical Domain	Cluster	Standard	Assessed Quarter	Chapter/ Section	Assessment Questions (segment of standard a, b, c...)
Expressions and Equations (7.EE)	Use properties of operations to generate equivalent expressions.	7.EE.1 Apply properties of operations as strategies to add, subtract, factor, expand and simplify linear expressions with rational coefficients.	1		18
			2		1, 2
Expressions and Equations (7.EE)	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*	1		7, 11, 17, 18
			2		11, 21, 23, 24, 25
			3		1
Expressions and Equations (7.EE)	Use properties of operations to generate equivalent expressions.	7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct multi-step equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* b. Solve word problems leading to inequalities of the form $px + q > r$ or px	1		12 (a), 22 (b)

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		+ *q* < *r*, where *p*, *q*, and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*			
			2		24 (b)
			3		4, 18 (b)
Geometry (7.G)	Draw, construct, and describe geometrical figures and describe the relationships between them.	7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	2		18
Geometry 7.G	Draw, construct, and describe geometrical figures and describe the relationships between them.	7.G.3 Describe the two-dimensional figures, i.e., cross-section, that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	4		2
Geometry 7.G	Solve real-life and mathematical problems involving angle measure, area, surface area, and	7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	4		3

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		volume.			
Geometry (7.G)	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	4		13
Geometry (7.G)	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	2		10
			3		25
			4		4
The Number System (7.NS)	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers: represent additional and subtraction on a horizontal or vertical number line diagram. Multiply and divide rational numbers and include other models to the representation. a. Show that a number and its opposite have a sum of 0 (additive inverses). Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*	1		2, 3, 4, 5

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		b. Understand addition of rational numbers (p + q as the number located a distance \q\ from p, in the positive or negative direction depending on whether q is positive or negative). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.			
			2		23 (d)
The Number System (7.NS)	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers and use equivalent representations a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. c. Apply and name properties of operations used as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	1		8 (c), 9 (a, c), 11 (a)

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		e. Convert between equivalent fractions, decimals, or percents.			
			2		7 (d), 9 (b), 11 (a, c), 25 (a, c)
The Number System (7.NS)		7.NS.3 Solve real-world and mathematical problems involving the four operations. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	1		6, 10
			2		3
Ratios and Proportional Relationships (7.RP)	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour or apply a given scale factor to find missing dimensions of similar figures.*	2		13
			4		1
Ratios and Proportional Relationships (7.RP)	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.2 Recognize and represent proportional relationships between quantities. Make basic inferences or logical predictions from proportional relationships. a. Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin). b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships in real-world situations. equations and multiple representations such as tables, graphs, diagrams, sequences, and contextual situations. *For*	2		12 (c), 14 (a, b), 15(a, b)

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		example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. d. Understand the concept of unit rate and show it on a coordinate plane. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.			
			3		2
Ratios and Proportional Relationships (7.RP)	Analyze proportional relationships and use them to solve real-world and mathematical problems.	7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error*	2		14, 15
			3		3
Statistics and Probability (7.SP)	Use random sampling to draw inferences about a population.	7.SP.1 Understand that statistics can be used to gain information about a population by examining a reasonably sized sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	4		6
Statistics and Probability (7.SP)	Use random sampling to draw inferences about a population.	7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict*	3		13, 14

Mathematical Domain	Cluster	Standard	Assessed Quarter	Chapter/ Section	Assessment Questions (segment of standard a, b, c…)
		the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.			
			4		7
Statistics and Probability (7.SP)	Draw informal comparative inferences about two populations.	7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*	4		8
Statistics and Probability (7.SP)	Draw informal comparative inferences about two populations.	7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	4		9
Statistics and Probability (7.SP)	Investigate chance processes and develop, use, and evaluate probability models.	7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	2		19, 20
Statistics and Probability (7.SP)	Investigate chance processes and develop, use, and evaluate probability models.	7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Design a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the*	2		20 (a), 21 (b)

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		probability that Jane will be selected and the probability that a girl will be selected. b. Design a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*			
Statistics and Probability (7.SP)	Investigate chance processes and develop, use, and evaluate probability models.	7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	2		22 (b)
			4		10
Statistics and Probability (7.SP)	Investigate chance processes and develop, use, and evaluate probability	7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	2		22

Mathematical Domain	Cluster	Standard	Assessed Quarter	Chapter/ Section	Assessment Questions (segment of standard a, b, c...)
	models.	b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*			
			4		10
Expressions and Equations (8.EE)	Work with radicals and integer exponents	8.EE.1 Apply the properties (product, quotient, power, zero, negative exponents, and rational exponents) of integer exponents to generate equivalent numerical expressions. *For example, 32 × 3–5 = 3–3 = 1/33 = 1/27.*	1		1
			2		4
Expressions and Equations (8.EE)	Work with radicals and integer exponents.	8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x2 = p$ and $x3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	3		19
Expressions and Equations (8.EE)	Work with radicals and integer exponents	8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 × 108 and the population of the world as 7 × 109, and determine that the world population is more than 20 times larger.*	2		5, 6
Expressions and Equations	Work with radicals and integer	8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both standard notation and scientific notation are used. Use scientific notation and choose units of appropriate size for	1		21 (b)

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(8.EE)	exponents	measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.			
			2		5, 6
Expressions and Equations (8.EE)	Understand the connections between proportional relationships, lines, and linear equations.	8.EE.5 Graph linear equations such as $y = mx + b$, interpreting m as the slope or rate of change of the graph and b as the y-intercept or starting value. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	3		12
Expressions and Equations (8.EE)	Understand the connections between proportional relationships, lines, and linear equations.	8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	3		11
Expressions and Equations (8.EE)	Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.7 Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.	1		13 (a, b), 14 (a, b), 15 (a, b), 16 (a, b), 17 (a, b), 18 (b), 19 (a, b), 20 (b)

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Expressions and Equations (8.EE)	Analyze and solve linear equations and pairs of simultaneous linear equations.	8.EE.8 Analyze and solve systems of linear equations. a. Show that the solution to a system of two linear equations in two variables is the intersection of the graphs of those equations because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables and estimate solutions by graphing the equations. Simple cases may be done by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	3		7 (a), 9 (c), 10 (b),
Functions (8.F)	Define, evaluate, and compare functions.	8.F.1 Understand that a function is a rule that assigns to each input (the domain) exactly one output (the range). The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. For example, use the vertical line test to determine functions and non-functions	3		5, 6
Functions (8.F)	Define, evaluate, and compare functions.	8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	3		8
Functions (8.F)	Use functions to model relationships between quantities.	8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	3		17

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Geometry (8.G)	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.1 Through experimentation, verify the properties of rotations, reflections, and translations (transformations) to figures on a coordinate plane). a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	4		14 (b, c)
Geometry (8.G)	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.2 Demonstrate understanding of congruence by applying a sequence of translations, reflections, and rotations on two dimensional figures. Given two congruent figures, describe a sequence that exhibits the congruence between them.	2		17
			4		15, 16, 17
Geometry (8.G)	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	4		18, 19, 20
Geometry (8.G)	Understand congruence and similarity using physical models, transparencies, or geometry	8.G.4 Demonstrate understanding of similarity, by applying a sequence of translations, reflections, rotations, and dilations on two-dimensional figures. Describe a sequence that exhibits the similarity between them.	2		16

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	software.				
			4		16
Geometry (8.G)	Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.5 Justify using informal arguments to establish facts about ▢ the angle sum of triangles (sum of the interior angles of a triangle is 180º), ▢ measures of exterior angles of triangles, ▢ angles created when parallel lines are cut be a transversal (e.g., alternate interior angles), and ▢ angle-angle criterion for similarity of triangles.	4		21
Geometry (8.G)	Understand and apply the Pythagorean Theorem.	8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	3		20, 21, 22
Geometry (8.G)	Understand and apply the Pythagorean Theorem.	8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	3		22
Geometry (8.G)	Understand and apply the Pythagorean Theorem.	8.G.9 Identify and apply the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	4		5
The Number System (8.NS)	Know that there are numbers that are not rational, and approximate them by rational	8.NS.1 Classify real numbers as either rational (the ratio of two integers, a terminating decimal number, or a repeating decimal number) or irrational.	2		8, 9

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	numbers.				
The Number System (8.NS)	Know that there are numbers that are not rational, and approximate them by rational numbers.	8.NS.2 Order real numbers, using approximations of irrational numbers, locating them on a number line. *For example, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	3		23
Statistics and Probability (8.SP)	Investigate patterns of association in bivariate data	8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association	1		7
			3		15, 16, 24
			4		11
Statistics and Probability (8.SP)	Investigate patterns of association in bivariate data.	8.SP.4 Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects and use relative frequencies to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	4		12