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2021 TN Academic Standards for Mathematics Correlated to *Moving with Algebra* Grade 8

		Part A Student Book Skill Builders (SB)	Part B Student Book Skill Builders (SB)	Part C Student Book Skill Builders (SB)
	The Number System (NS)			
A.	**Know that there are numbers that are not rational, and approximate them by rational numbers.**			
8.NS.A.1	Know that real numbers that are not rational are called irrational (*e.g., π, √2, etc.*). Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates, and convert a decimal expansion which repeats eventually or terminates into a rational number.	80, 140-142, 165, 166 **SB:** 61, 110, 111, 115, 116, 145		
8.NS.A.2	Use rational approximations of irrational numbers to compare the size of irrational numbers by locating them approximately on a number line diagram. Estimate the value of irrational expressions (such as π^2). *For example, by truncating the decimal expansion of √2, 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.*		220 **SB:** 186	
	Expressions and Equations (EE)			
A.	**Work with radicals and integer exponents.**			
8.EE.A.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, 32 x 3- 5 =3-3 =1/33 =1/27.*	18, 19 **SB:** 14	299-301, 305 **SB:** 231, 254	390, 391 **SB:** 306, 308
8.EE.A.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.		219, 308, 309 **SB:** 185, 234	394, 395 **SB:** 312, 313
8.EE.A.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 x 108 and the population of the world as 7 x 109, and determine that the world population is more than 20 times larger.*	22, 23, 25 **SB:** 17, 18		**SB:** 307
8.EE.A.4	Using technology, solve real-world problems with numbers expressed in decimal and scientific notation. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading).			
B.	**Understand the connections between proportional relationships, lines, and linear equations.**			
8.EE.B.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*		318, 320 **SB:** 240, 241, 256, 262	362-364 **SB:** 284, 285, 297-300

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8.EE.B.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; know and apply 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.		324-327 **SB:** 242, 243	352-359, 361 **SB:** 276-280
C.	**Analyze and solve linear equations, linear inequalities, and systems of two linear equations.**			
8.EE.C.7	Solve linear equations in one variable.			342-347 **SB:** 265-269, 270, 271, 301
	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).			SB: 329
	b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.		257-265, 270, 271 274-278, 283-285, 287-291 **SB:** 213-221, 223, 226, 227, 252, 253	346, 347 **SB:** 268, 269, 271, 301
8.EE.C.8	Analyze and solve systems of two linear equations graphically.			
	a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.			403 **SB:** 323, 324
	b. Estimate solutions by graphing a system of two linear equations in two variables. Identify solutions by inspecting graphs.			403 **SB:** 323, 324
8.EE.C.9	By graphing on the coordinate plane or by analyzing a given graph, determine the solution set of a linear inequality in one or two variables.			408, 409 **SB:** 332-334
	Functions (F)			
A.	**Define, evaluate, and compare functions.**			
8.F.A.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in 8th grade.)		235, 236, 315-321 **SB:** 198, 199, 238-241, 256, 262	349, 398, 399 **SB:** 273, 297, 316-318
8.F.A.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and another linear function represented by an algebraic expression, determine which function has the greater rate of change.*		236	**SB:** 319

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8.F.A.3	Know and interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*		321, 329-332 **SB:** 245, 251, 261	348, 351-353, 355, 356, 400, 401 **SB:** 272, 275-277, 279, 280
B.	**Use functions to model relationships between quantities.**			
8.F.B.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.		315-322, 328, 336, 337 **SB:** 238, 239, 256, 262	351-362 **SB:** 279, 280, 282-284
8.F.B.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.			**SB:** 319
	Geometry (G)			
A.	**Understand and describe the effects of transformations on two-dimensional figures and use informal arguments to establish facts about angles.**			
8.G.A.1	Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.			
	a. Verify informally that lines are taken to lines, and determine when line segments are taken to line segments of the same length.		204 **SB:** 171, 172	
	b. Verify informally that angles are taken to angles of the same measure.		204 **SB:** 171, 172	
	c. Verify informally that parallel lines are taken to parallel lines.		204 **SB:** 171, 172	
	d. Make connections between dilations and scale factors.		228	
8.G.A.2	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.		203, 204 **SB:** 170-172	
B.	**Understand and apply the Pythagorean Theorem.**			
8.G.B.3	Explain a model of the Pythagorean Theorem and its converse.		221	
8.G.B.4	Know and apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.		221, 222 **SB:** 187	
8.G.B.5	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.			
C.	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**			
8.G.C.6	Apply the formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems.		216	
	Statistics and Probability (SP)			
A.	**Investigate patterns of association in bivariate data.**			

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8.SP.A.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.			367-369 **SB:** 287
8.SP.A.2	Know that straight lines are widely used to model linear relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line.			368, 372
8.SP.A.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercepts. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*			372, 373 **SB:** 289
B.	**Investigate chance processes and develop, use, and evaluate probability models**			
8.SP.B.4	Find probabilities of and represent sample spaces for 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.			