7th Grade Math

Power Standard: Students will solve real world, grade appropriate problems involving integers, decimals, fractions, irrational numbers, rational numbers, discounts, interest, taxes and tips; justify solutions in performing operations with adding, subtracting, multiplying, and dividing.			
M.O.7.1.1 DOK 1	compare, order, and differentiate among integers, decimals, fractions, and irrational numbers using multiple representations (e.g., symbols, manipulatives, graphing on a number line).		
Knowledge	Reasoning	Performance	Product
Vocabulary: Integer, decimal, fraction, irrational #	Compare fractions using multiple representations	Use manipulatives to compare fractions	Graphing on a number line to compare and order fractions
	Compare decimals using multiple representations	Use manipulatives to compare decimals	Graphing on a number line to compare and order decimals
	Compare integers using multiple representations	Use manipulatives to compare integers	Graphing on a number line to compare and order integers
	Compare irrational numbers using multiple representations	Use manipulatives to order fractions	
	Order fractions using multiple representations	Use manipulatives to order decimals	
	Order decimals using multiple representations	Use manipulatives to order integers	
	Order integers using multiple		

	representations		
	Order irrational numbers using multiple representations		
	Differentiate among integers, fractions, decimals, and irrational numbers		
M.O.7.1.3 DOK 2	using simple computation and problem-solving situations, demonstrate fluency and justify solutions in performing operations with rational numbers including negative numbers for • adding • subtracting • multiplying • dividing		
Knowledge	Reasoning	Performance	Product
Vocabulary: rational number	Using simple computation, demonstrate fluency in performing operations with rational numbers	Using simple computation justify solutions in performing operations with rational numbers	
Add	Using problem solving situations, demonstrate fluency in performing operations with rational numbers	Using problem solving situations, justify solutions in performing operations with rational numbers	
Subtract			
Multiply			
Divide			

M.O.7.1.5 DOK 3	analyze and solve grade-appropriate real-world problems with whole numbers, integers, decimals, fractions and percents including problems involving • discounts, • interest, • taxes, • tips, • percent increase or decrease, and justify solutions including using estimation and reasonableness.		
Knowledge	Reasoning	Performance	Product
Vocabulary :discounts, interest, taxes, tips, percent, percent increase, percent decrease	Analyze grade appropriate real world problems with whole numbers, including problems involving discounts	Justify using estimation grade appropriate real world problems with whole numbers, including problems involving discounts	
	Analyze grade appropriate real world problems with whole numbers, including problems involving interest	Justify using estimation grade appropriate real world problems with whole numbers, including problems involving interest	
	Analyze grade appropriate real world problems with whole numbers, including problems involving taxes	Justify using estimation grade appropriate real world problems with whole numbers, including problems involving taxes	
	Analyze grade appropriate real world problems with whole numbers, including problems	Justify using estimation grade appropriate real world problems with whole numbers, including	

	involving tips	problems involving tips	
	Analyze grade appropriate real world problems with whole numbers, including problems involving percent	Justify using estimation grade appropriate real world problems with whole numbers, including problems involving percent	
	Analyze grade appropriate real world problems with integers, including problems involving discounts	Justify using estimation grade appropriate real world problems with integers, including problems involving discounts	
	Analyze grade appropriate real world problems with integers, including problems involving interest	Justify using estimation grade appropriate real world problems with integers, including problems involving interest	
	Analyze grade appropriate real world problems with integers, including problems involving taxes	Justify using estimation grade appropriate real world problems with integers, including problems involving taxes	
	Analyze grade appropriate real world problems with integers, including problems involving tips	Justify using estimation grade appropriate real world problems with integers, including problems involving tips	
	Analyze grade appropriate real world problems with integers,	Justify using estimation grade appropriate real world problems	

	including problems involving percent	with integers, including problems involving percent	
	Analyze grade appropriate real world problems with fractions, including problems involving discounts	Justify using estimation grade appropriate real world problems with fractions, including problems involving discounts	
	Analyze grade appropriate real world problems with fractions, including problems involving interest	Justify using estimation grade appropriate real world problems with fractions, including problems involving interest	
	Analyze grade appropriate real world problems with fractions, including problems involving taxes	Justify using estimation grade appropriate real world problems with fractions, including problems involving taxes	
	Analyze grade appropriate real world problems with fractions, including problems involving tips	Justify using estimation grade appropriate real world problems with fractions, including problems involving tips	
	Analyze grade appropriate real world problems with fractions, including problems involving percent	Justify using estimation grade appropriate real world problems with fractions, including problems involving percent	

	Analyze grade appropriate real world problems with decimals, including problems involving discounts	Justify using estimation grade appropriate real world problems with decimals, including problems involving discounts	
	Analyze grade appropriate real world problems with decimals, including problems involving interest	Justify using estimation grade appropriate real world problems with decimals, including problems involving interest	
	Analyze grade appropriate real world problems with decimals, including problems involving taxes	Justify using estimation grade appropriate real world problems with decimals, including problems involving taxes	
	Analyze grade appropriate real world problems with decimals, including problems involving tips	Justify using estimation grade appropriate real world problems with decimals, including problems involving tips	
	Analyze grade appropriate real world problems with decimals, including problems involving percent	Justify using estimation grade appropriate real world problems with decimals, including problems involving percent	
		Justify using reasonableness grade appropriate real world problems with whole numbers, including	

		problems involving discounts	
		Justify using reasonableness grade appropriate real world problems with whole numbers, including problems involving interest	
		Justify using reasonableness grade appropriate real world problems with whole numbers, including problems involving taxes	
		Justify using reasonableness grade appropriate real world problems with whole numbers, including problems involving tips	
		Justify using reasonableness grade appropriate real world problems with whole numbers, including problems involving percent	
		Justify using reasonableness grade appropriate real world problems with integers, including problems involving discounts	
		Justify using reasonableness grade appropriate real world problems	

		with integers, including problems involving interest	
		Justify using reasonableness grade appropriate real world problems with integers, including problems involving taxes	
		Justify using reasonableness grade appropriate real world problems with integers, including problems involving tips	
		Justify using reasonableness grade appropriate real world problems with integers, including problems involving percent	
		Justify using reasonableness grade appropriate real world problems with fractions, including problems involving discounts	
		Justify using reasonableness grade appropriate real world problems with fractions, including problems involving interest	

		Justify using reasonableness grade appropriate real world problems with fractions, including problems involving taxes	
		Justify using reasonableness grade appropriate real world problems with fractions, including problems involving tips	
		Justify using reasonableness grade appropriate real world problems with fractions, including problems involving percent	
		Justify using reasonableness grade appropriate real world problems with decimals, including problems involving discounts	
		Justify using reasonableness grade appropriate real world problems with decimals, including problems involving interest	
		Justify using reasonableness grade appropriate real world problems with decimals, including problems	

		involving taxes	
		Justify using reasonableness grade appropriate real world problems with decimals, including problems involving tips	
		Justify using reasonableness grade appropriate real world problems with decimals, including problems involving percent	
Power Standard: Students will use mathematical properties and inductive and deductive reasoning to solve algebraic sequences and expressions with whole numbers, integers, absolute value and exponents; solve & graph real world one step linear equations and inequalities.			
M.O.7.1.4 DOK 2	justify the use of the commutative, associative, distributive, identity and inverse properties to simplify numeric expressions.		
Knowledge	Reasoning	Performance	Product
Vocabulary: Commutative, Associative, Distributive, Identity, Inverse Properties	use of the commutative property to simplify numeric expressions	Justify the use of commutative property to simplify numeric expressions	
	use of the associative property to simplify numeric expressions	Justify the use of associative property to simplify numeric	

		expressions	
	use of the distributive property to simplify numeric expressions	Justify the use of distributive property to simplify numeric expressions	
	use of the identity property to simplify numeric expressions	Justify the use of identity property to simplify numeric expressions	
	use of the inverse property to simplify numeric expressions	Justify the use of inverse property to simplify numeric expressions	
M.O.7.2.1 DOK 3	use inductive reasoning to find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.		
Knowledge	Reasoning	Performance	Product
Vocabulary: patterns, sequences, series	Use inductive reasoning to find missing elements in arithmetic patterns		
	Use inductive reasoning to find missing elements in geometric patterns		
	Use inductive reasoning to find missing elements in algebraic sequences		

	Use inductive reasoning to find missing elements in algebraic series		
M.O.7.2.2 DOK 1	evaluate algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations.		
Knowledge	Reasoning	Performance	Product
Vocabulary: whole numbers, integers, absolute value, exponents	Evaluate algebraic expressions with whole numbers using the order of operations		
Order of Operation	Evaluate algebraic expressions with integers using the order of operations		
	Evaluate algebraic expressions with absolute values using the order of operations		
	Evaluate algebraic expressions with exponents using the order of operations		
M.O.7.2.5	solve one-step linear equations and inequalities using a variety of strategies containing rational numbers with integer solutions; graph solutions, and justify the selection of the strategy and the reasonableness of the solution.		

DOK 3			
Knowledge	Reasoning	Performance	Product
Vocabulary: Linear equation, inequality, rational number, integer	Solve one-step linear equations using a variety of strategies containing rational numbers with integer solutions	Justify the selection of the strategy	Graph solutions to one-step linear equations
	Solve one-step inequalities using a variety of strategies containing rational numbers with integer solutions	Justify the reasonableness of the solution	Graph solutions to one-step inequalities
M.O.7.2.8 DOK 3	represent algebraically and solve real-world application problems and justify solutions.		
Knowledge	Reasoning	Performance	Product
	Represent algebraically real world application problems	Justify solutions of real world application problems	
	Solve real world application problems		
M.O.7.2.3 DOK 2	solve problems by creating an input/output function table(including, but not limited to, spreadsheets) to predict future values, given a real-world situation involving rational numbers.		

Knowledge	Reasoning	Performance	Product
Vocabulary: input, output, function table, spreadsheet, future value	Solve problems by creating an input/output function table to predict future values, given a real world situation involving rational numbers with technology (spreadsheets)		Create an input/output function table with technology
	Solve problems by creating an input/output function table to predict future values, given a real world situation involving rational numbers without technology		Create an input/output function table without technology
Power Standard: Students will solve real world problems involving scientific notation			
M.O.7.1.7 DOK 2	solve problems using numbers in scientific notation (positive and negative exponents) with and without technology, and interpret from real life contexts.		
Knowledge	Reasoning	Performance	Product
Vocabulary: scientific notation	Solve problems using numbers in scientific notation in positive exponents with technology	Interpret scientific notation from real life contexts	
	Solve problems using numbers in scientific notation in negative exponents with technology		

	Solve problems using numbers in scientific notation in positive exponents without technology		
	Solve problems using numbers in scientific notation in negative exponents without technology		
Power Standard: Students will convert within and between the customary and metric system.			
M.O.7.4.3 DOK 1	convert units of measurement, linear, area and volume, within customary and metric systems.		
Power Standard: Students will make and test predictions to determine theoretical probability, combinations and permutations of an event; collect, organize, interpret and graphically represent real world data displays involving measures of central tendency and dispersion.			
M.O.7.5.1 DOK 2	determine theoretical probability of an event, make and test predictions through experimentation.		
M.O.7.5.2 DOK 2	determine combinations and permutations by constructing sample spaces (e.g., listing, tree diagrams, frequency distribution tables).		
M.O.7.5.3 DOK 2	collect, organize, graphically represent, and interpret data displays including frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs.		
M.O.7.5.4 DOK 3	analyze and solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology to compare two sets of data.		
Power Standard: Students will solve real world problems involving Pythagorean Theorem, perimeter, circumference, area, volume, surface area and distance and temperature using squares and square roots and the laws of exponents.			

M.O.7.1.2 DOK 2	model the relationship between perfect squares and square roots using physical representations; estimate square root and evaluate using technology.		
Knowledge	Reasoning	Performance	Product
Vocabulary: perfect square, square root, estimate	Estimate square root	Model the relationship between perfect squares and square roots	
	Evaluate square root using technology		
M.O.7.1.6 DOK 2	use inductive reasoning to find and justify the laws of exponents with numeric bases		
Knowledge	Reasoning	Performance	Product
Vocabulary: exponents, numeric bases	Use inductive reasoning to find the laws of exponents with numeric bases	Use inductive reasoning to justify the laws of exponents with numeric bases	
Laws of exponents			
M.O.7.4.1 DOK 2	select and apply an appropriate method to solve (including, but not limited to, formulas) justify the method and the reasonableness of the solution, given a real-world problem solving situation involving • perimeter • circumference • area • surface area of prisms (rectangular and triangular) • volume of prisms and cylinders distance and temperature (Celsius, Fahrenheit)		
Knowledge	Reasoning	Performance	Product

Vocabulary: formula, perimeter ,circumference, area, surface area, volume, prism, cylinder, Celsius, Fahrenheit	Select an appropriate method to solve a real-world problem involving perimeter		
	Select an appropriate method to solve a real-world problem involving circumference		
	Select an appropriate method to solve a real-world problem involving area		
	Select an appropriate method to solve a real-world problem involving surface area		
	Select an appropriate method to solve a real-world problem involving volume		
M.O.7.4.2 DOK 2	use the Pythagorean Theorem to find the length of any side of a right triangle and apply to problem solving situations.		
Power Standard: Students will use the Cartesian coordinate plane to solve real world problems involving transformations and symmetry of plane figures			
M.O.7.2.6	plot lines within the Cartesian coordinate plane from a table of values to solve mathematical real-world problems.		

DOK 2	
M.O.7.2.7 DOK 1	determine the slope of a line from its graphical representation.
M.O.7.3.2 DOK 1	apply line symmetry to classify plane figures.
M.O.7.3.3 DOK 3	apply rotations, reflections, translations to plane figures and determine the coordinates of its transformation and compare and contrast the new figure with the original.
Power Standard: Students will solve real world problems involving ratios and proportions to compare a hypothesis and conclusion; to collect, organize, and display using graphs, scale drawings, models or tables.	
M.O.7.2.4 DOK 3	analyze proportional relationships in real-world situations, select an appropriate method to determine the solution and justify reasoning for choice of method to solve.
M.O.7.2.9 DOK 4	identify a real life problem involving proportionality; make a hypothesis as to the outcome; develop, justify, and implement a method to collect, organize, and analyze data; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project using words, graphs, drawings, models, or tables.
M.O.7.3.4 DOK 2	pose and solve ratio and proportion problems including scale drawings and similar polygons.
M.O.7.3.5 DOK 2	solve problems and explain the relationships among scale factor and area and volume including • square of a scale factor

	• cube of a scale factor
Power Standard: Students will solve real world problems using compound geometric figures to identify and construct angle pairs, segments and bisectors.	
M.O.7.3.1 DOK 1	identify and construct • angle-pairs adjacent, complementary, supplementary, vertical • congruent segments and angles • perpendicular bisectors of segments angle-bisectors
M.O.7.3.6 DOK 3	solve mathematical real-world problems using compound geometric figures.