Common Core Math Curriculum – Grade 5

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	GRADE 5 SKILL	VOCABULARY	MATHEMATICAL PRACTICES	ASSESSMENT
What can affect the relationship between numbers?	***Operations and Algebraic Thinking 5.0A*** Write and interpret numerical expressions	❑ Evaluate numerical expressions with parentheses, brackets, and/or braces. 5.0A.1 ❑ Write numerical expressions with parentheses, brackets, and/or braces. 5.OA.1 ❑ Translate verbal expressions to numerical expressions.5.0A.2 ❑ Write simple numerical expressions from verbal expressions without evaluating the expression. 5.OA.2 ❑ Translate numerical expressions to verbal expressions. 5.OA.2	▪ parentheses ▪ brackets ▪ braces ▪ Symbol ▪ sum ▪ difference ▪ product ▪ quotient	1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others.	Math Journals Performance tasks http://palm.sri.com/ http://www.exemplars.com
	Analyze patterns and relationships	❑ Generate two numerical patterns using two given rules. 5.OA.3 ❑ Describe the relationship between two numerical patterns. 5.OA.3 ❑ Construct input/output table to form ordered pairs. 5.OA.3 ❑ Graph ordered pairs on a coordinate plane. 5.OA.3 ❑ Identify the relationship between two numerical patterns on a graph. 5.OA.3 ❑ Explain why the relationship between two numerical patterns on a graph exists. 5.OA.3 ❑ Write the rule for a pattern using a variable. 5.OA.3	▪ ordered pairs ▪ corresponding terms ▪ patterns ▪ numerical patterns ▪ coordinate plane ▪ variable ▪ corresponding terms	4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure.	http://mathforum.org/mathed/ assessment.html http://www.teachersfirst.com
How do we round decimals? How do we compare decimals? What patterns occur in our number system?	***Numbers and Operations in Base Ten 5.NBT*** Understanding the place value system	❑ Define a number in one place as 1/10 of its value in the place to its left. 5.NBT.1 ❑ Define a number in one place as 10 times its value in the place to its right 5.NBT.1 ❑ Explain the pattern in the number of zeros in a product when multiplying by powers of 10. 5.NBT.2 ❑ Explain the pattern in moving the decimal point when multiplying or dividing by powers of 10. 5.NBT.2 ❑ Write whole number exponents to denote powers of 10. 5.NBT.2 ❑ Read and write decimals to the thousandths using base 10 numerals. 5.NBT.3a ❑ Read and write decimals to the thousandths using number names. 5.NBT.3a ❑ Read and write decimals to the thousandths using expanded form (with fractions of 1/10, 1/100, and 1/1000 to denote decimal places). 5.NBT.3a ❑ Compare two decimals to the thousandths using greater than, less than, and equal to symbols. 5.NBT.3b	▪ place value names ▪ base ten ▪ powers of ten ▪ exponents ▪ product ▪ place value names ▪ base ten numerals ▪ number names ▪ expanded form ▪ greater than ▪ less than ▪ equal to ▪ Round ▪ Estimation ▪ decimals	8. Look for and express regularity in repeated reasoning. <u>TOOLS</u> Prior Year -NYS Gr. 5 Assessment Booklets Geometric shapes Fraction tiles/bars Unit cubes	

How do we solve problems with whole numbers and decimals?	Perform operations with multi-digit whole numbers with decimals to hundredths	❑ Round decimals to any place (up to thousandths). 5.NBT.4 ❑ Justify the reasonableness of a solution using estimation.5.NBT.4 ❑ Multiply multi-digit whole numbers using the standard algorithm. 5.NBT.5 ❑ Divide whole numbers with up to 4-digit dividends and 2-digit divisors. 5.NBT.6 ❑ Illustrate and explain quotient (solution) through equations, rectangular arrays, and/or area models. 5.NBT.6 ❑ Add decimals (to hundredths place). 5.NBT.7 ❑ Subtract decimals (to hundredths place). 5.NBT.7 ❑ Multiply decimals (to hundredths place). 5.NBT.7 ❑ Divide decimals (whole number divisors and dividends to hundredths place). 5.NBT.7 ❑ Explain method used to solve problems in all four operations. 5.NBT.7	▪ Factors ▪ Product ▪ algorithm ▪ Divisor ▪ Dividend ▪ Quotient ▪ rectangular array ▪ area model ▪ Add ▪ Hundredths ▪ Addend ▪ Difference	Ruler Graph paper WEBSITES www.k-5mathteachingresources.com www.engageny.org http://mathleague.com/ http://illuminations.nctm.org/ http://www.exemplars.com
How do we add, subtract and multiply fractions?	***Number and Operations – Fractions 5.NF*** Use equivalent fractions as a strategy to add and subtract fractions.	❑ Add fractions with unlike denominators (including mixed numbers). 5.NF.1 ❑ Subtract fractions with unlike denominators (including mixed numbers). 5.NF.1 ❑ Simplify fraction solutions. 5.NF.1 ❑ Rewrite two fractions with unlike denominators to have common denominators in order to add or subtract fractions 5.NF.1 ❑ Solve word problems involving addition and subtraction of fractions of unlike denominators referring to the same whole. 5.NF.2 ❑ Justify the reasonableness of a solution using estimation and benchmark fractions. 5.NF.2	▪ Simplify ▪ common denominators ▪ unlike denominators ▪ benchmark fractions ▪ estimation	http://www.edhelper.com /math_grade5.htm http://www.nctm.org http://www.nctm.org/resources
How does multiplying fractions relate to real world problems?	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	❑ Define a fraction as division of the numerator by its denominator. 5.NF.3 ❑ Solve word problems involving the division of two whole numbers where the solution is a fraction or mixed number. 5.NF.3 ❑ Explain between what two whole numbers the fraction solution lies. 5.NF.3 ❑ Draw a fraction model to illustrate a product of a fraction by a whole number and a fraction by a fraction. 5.NF.4a ❑ Relate multiplying by a fraction as taking "part of" a whole number. 5.NF.4a ❑ Compute the area of a rectangle with fractional side lengths. 5.NF.4b ❑ Tile a unit square into unit fraction side lengths 5.NF.4b ❑ Prove through tiling the equivalence of multiplication and area. 5.NF.4b	▪ Numerator ▪ Denominator ▪ Division ▪ part of ▪ area ▪ tiling ▪ unit fraction ▪ unit square ▪ equivalence ▪ Product ▪ Factor ▪ improper fraction ▪ mixed number Product ▪ equivalent fraction	Literature: http://www.mathsolutions.com/ documents/lessons_chart-2.pdf

| How do you show multiplying fractions in a visual model?

How do you simplify fractions. | | ❑ Describe the size of a product in terms of how many times larger one factor is to another without multiplying. 5.NF.5a
❑ Explain and show why multiplying by a fraction less than one will result in a product less than the greater number. 5.NF.5a
❑ Explain and show why multiplying by an improper/mixed number will result in a product greater than the given number. 5.NF.5a
❑ Explain and show why multiplying by a fraction equal to 1 result in an equivalent fraction. 5.NF.5a
❑ Explain and show why multiplying by a fraction less than one will result in a product less than the greater number 5.NF.5b
❑ Explain and show why multiplying by an improper/mixed number will result in a product greater than the given number. 5.NF.5b
❑ Explain and show why multiplying by a fraction equal to 1 result in an equivalent fraction. 5.NF.5b
❑ Rewrite the number 1 as an equivalent fraction i.e. 2/2, 3/3, 4/4, etc. 5.NF.5b
❑ Solve word problems involving multiplication of fractions and mixed numbers. 5.NF.6
❑ Represent the product of fractions in simplest form. 5.NF.6
❑ Write equations to represent word problems involving multiplication of fractions. 5.NF.6
❑ Draw/show multiplication of fractions through visual models. 5.NF.6
❑ Define a unit fraction as fraction with a numerator of 1. 5.NF.7a
❑ Divide a unit fraction by a whole number. 5.NF.7a
❑ Draw/show division of a unit fraction by a whole number as dividing the unit fraction into smaller parts. 5.NF.7a
❑ Create a story in which division of a unit fraction by a whole number is used. 5.NF.7a
❑ Explain the effects of dividing a unit fraction by a whole number. 5.NF.7a
❑ Justify the reasonableness of answer in the context of a problem. 5.NF.7a
❑ Simplify/reduce quotients to lowest terms. 5.NF.7a
❑ Define a unit fraction as a fraction with a numerator of 1. 5.NF.7b
❑ Divide a whole number by a unit fraction. 5.NF.7b
❑ Create a story in which division of a whole number by a unit fraction is used. 5.NF.7b
❑ Explain the effects of dividing a whole number by a unit fraction. 5.NF.7b
❑ Define the reciprocal of a unit fraction for the purpose of division. 5.NF.7b
❑ Simplify/reduce quotients to lowest terms. 5.NF.7b | ▪ Fractions
▪ mixed number
▪ visual models
▪ whole number
▪ divide
▪ estimation
▪ lowest terms
▪ unit fraction
▪ whole number
▪ estimation
▪ quotients | | |

		❑ Justify the reasonableness of answer in the context of a problem. 5.NF.7b		
		❑ Divide a whole number by a unit fraction (vice versa) in the context of word problems. 5.NF.7c		
		❑ Solve a story/word problem in which division of a whole number by a unit fraction (vice versa) is used. 5.NF.7c		
		❑ Explain the effects of dividing a whole number by a unit fraction (vice versa) in the context of a word problem. 5.NF.7c		
		❑ Justify the reasonableness of answer in terms of the context of the problem. 5.NF.7c	▪ measurement systems ▪ convert	
	Measurement and Data	❑ Simplify/reduce quotients to lowest terms. 5.NF.7c		
How do we convert measurements within systems?	***5.MD*** Convert like measurement units within a given measurement system. Represent and interpret data	❑ Convert measurements within a given measurement system. 5.MD.1 ❑ Solve multi-step measurement conversion word problems. 5.MD.1 ❑ Create and label a line plot to display a data set containing fractions. 5.MD.2 ❑ Calculate the average of a data set containing fractions with unlike denominators. 5.MD.2 ❑ Solve problems using data (fractions) represented in a line plot. 5.MD.2 ❑ Add, subtract, multiply, and divide fractions. 5.MD.2 ❑ Simplify/reduce fractions to lowest terms. 5.MD.2	▪ line plot ▪ data ▪ average (mean) ▪ fractions ▪ lowest terms ▪ repeated addition ▪ volume ▪ solid figure	
How do we represent the inside of a 3 dimensional figure?	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition	❑ Explain a unit cube as having side length of one. 5.MD.3a ❑ Describe volume in terms of cubic units. 5.MD.3a ❑ Describe volume in terms of cubic units. 5.MD.3a ❑ Explain/show the volume of a solid figure through repeated addition of unit cubes. 5.MD.3b ❑ Explain the difference between 2D and 3D figures. 5MD.3b ❑ Calculate the volume of a solid figure by counting the unit cubes. 5MD.4 ❑ Select the appropriate unit of measure for calculating the volume of a figure. 5.MD.4 ❑ Convert between units of measure when calculating volume. 5.MD.4 ❑ Define right rectangular prism. 5.MD.5a ❑ Calculate the volume of a right rectangular prism by packing it with unit cubes. 5.MD.5a ❑ Calculate the volume of a right rectangular prism by using the formulas V = l x w x h and V = B x h (Area of the Base times the height.) 5.MD.5a ❑ Explain how finding the volume using the methods above result in the same solution. 5.MD.5a ❑ Calculate the volume of a rectangular prism using the formulas: V=l x w	▪ 2D figures ▪ 3D figures • unit cube ▪ solid figure ▪ volume ▪ right rectangular prism ▪ base ▪ length ▪ width ▪ height ▪ Area of the base (B) ▪ non-overlapping parts	

		x h and V=B x h 5.MD.5b ❑ Describe/show how *l* x *w* = *B* (length times width equals area of the base (B). 5.MD.5b ❑ Calculate the volume of a right rectangular prism in the context of a word problem. 5MD.5b ❑ Calculate the volumes of non-overlapping right rectangular prisms and add them together. 5.MD.5c ❑ Solve word problems requiring the calculations of multiple volumes and adding them together. 5.MD.5c		
How do we graph ordered pairs?	***Geometry*** ***5.G*** Graph points on the coordinate plane to solve real-world and mathematical problems.	❑ Define the coordinate plane as a set of perpendicular lines, called axes. 5.G.1 ❑ Define the intersection of the perpendicular lines as the origin. 5.G.1 ❑ Define the first number in an ordered pair as how far the point travels left or right, known as the x-coordinate. 5.G.1 ❑ Define the second number in an ordered pair as how far the point travels up or down, known as the y-coordinate. 5.G.1 ❑ Describe the horizontal axis as the x-axis and the vertical axis as the y-axis. 5.G.1 ❑ Graph points in the first quadrant based on word problems. 5.G.2 ❑ Plot coordinates on a plane. 5.G.2	▪ coordinate plane ▪ perpendicular lines ▪ origin ▪ y-coordinate ▪ x-coordinate ▪ y-axis ▪ x-axis ▪ Coordinates ▪ Quadrant ▪ Axes ▪ ordered pairs	
What are the properties of 2 dimensional figures?	Classify two-dimensional figures into categories based on their properties	❑ Identify given polygons. 5.G.3 ❑ Describe the attributes of given polygons 5.G.3 ❑ Categorize polygons according to their attributes. 5.G.3 ❑ Define subcategories within polygon categories. 5.G.3 ❑ Describe polygons belonging to a category also belong to all subcategories. 5.G.3 ❑ Classify two-dimensional figures based on their properties. 5.G.4 ❑ Classify two-dimensional figures in a hierarchy based on their properties. 5.G.4	▪ Polygons ▪ Attributes ▪ Category ▪ Subcategory ▪ two-dimensional figures ▪ hierarchy ▪ properties	