Diocese of Boise Math Curriculum – 5th grade

<table>
<tr><th>ESSENTIAL QUESTIONS</th><th>DOMAINS AND CLUSTERS</th><th>5th GRADE MATH SKILLS</th><th>VOCABULARY</th><th>PRACTICES, RESOURCES & ASSESSMENT</th></tr>
<tr>
<td>Sample Questions Below:

What can affect the relationship between numbers?

What does a decimal represent?

How do we compare decimals?

How do we round decimals?

What is a whole number?</td>
<td>Operations and Algebraic Thinking

Write and interpret numerical expressions

Analyze patterns and relationships</td>
<td>
Introduced Skills
<table>
<tr><td></td><td>Write exponents in expanded form</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Write decimals in expanded form</td></tr>
<tr><td></td><td>Identify Roman Numerals</td></tr>
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Mastered Skills
<table>
<tr><td></td><td>Fluently add and subtract multi-digit numbers</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Represent whole-number products as rectangular areas in mathematical reasoning</td></tr>
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Introduced Skills
<table>
<tr><td></td><td>Interpret models as products of whole numbers (i.e. describe a context in which a total number of objects can be expressed as 5x7)</td></tr>
<tr><td></td><td>Interpret models as whole-number quotients of whole numbers (i.e. describe the context in which a number of shares or a number of groups can be expressed as 56□8)</td></tr>
<tr><td></td><td>Explain division as an unknown-factor problem</td></tr>
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<td>RIT 216-235 & Above
• Base
• Composite figure
• Congruent figure
• Convert
• Customary units
• Degree (temp, geometry)
• Equation
• Evaluate
• Height
• Horizontal
• Identity property
• Inequality
• Interval
• Formula
• Line segment
• End point
• Kilometer
• Mass
• Metric system
• Prism
• Volume
• Diagram
• Denominator
• Numerator
• Improper fraction
• Order of operations</td>
<td>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

4. Model with mathematics

5. Use appropriate tools strategically

6. Attend to precision

7. Look for and make sense of structure</td>
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<tr>
<td>What is a rational number?

How do you show multiplying fractions in a visual model?</td>
<td>Operations and Algebraic Thinking</td>
<td>
Reviewed Skills
<table>
<tr><td></td><td>Multiply a whole number of up to four digits by a one-digit whole number</td></tr>
<tr><td></td><td>Multiply two two-digit numbers</td></tr>
<tr><td></td><td>Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors</td></tr>
<tr><td></td><td>Multiply multi-digit whole numbers</td></tr>
<tr><td></td><td>Divide multi-digit numbers</td></tr>
<tr><td></td><td>Apply the distributive property [i.e. 8(5+2)=(8x5)+(8+2) = 40+16 = 56]</td></tr>
</table>
Mastered Skills
<table>
<tr><td></td><td>Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities</td></tr>
<tr><td></td><td>Determine the unknown whole number in a multiplication or division equation relating three whole numbers (8x?=48, 5=□□3, 6x6=?)</td></tr>
<tr><td></td><td>Apply the commutative property of multiplication (if 6x4=24 then 4x6=24)</td></tr>
<tr><td></td><td>Apply the associative property of multiplication [i.e. (3x5)2=3(5x2)=30]</td></tr>
<tr><td></td><td>Fluently multiply and divide within 100 using fact families, relationships strategies or properties of operations</td></tr>
<tr><td></td><td>Know from memory all products of two one-digit numbers</td></tr>
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<td>

Power of ten
Variable
Quadrant
Sequence
Reflection
Rational numbers
Unit fraction
Rate

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<td>
8. Look for and express regularity in repeated reasoning

RESOURCES:
Geometric shapes/visuals
Ruler
Graph paper
Text
Khan Academy
Calculator

ASSESSMENT:

Class discussion
Questioning techniques
Exit ticket
Quiz
Performance tasks
Learning logs
Math journals
Think-pair-share
Chapter test
Standardized test

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ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
What patterns occur in our number system? How do we convert measurements within a system?	***Operations and Algebraic Thinking***	**Reviewed Skills** Solve word problems in which remainders must be interpreted Represent verbal statements of comparisons as equations Multiply and divide to solve word problems involving multiplicative comparisons Assess the reasonableness of answers using mental computation and estimation strategies (including rounding) Use parentheses, brackets or braces in numerical expressions and evaluate expressions with these symbols **Mastered Skills** Solve multi-step word problems using the four operations Solve problems involving integers using the four operations **Introduced Skills** Find the greatest common factor of two whole numbers less than or equal to 100 Find the least common multiple of two whole numbers less than or equal to 12 **Reviewed Skills** Find all factors for a whole number in the range 1-100 Recognize that a whole number is a multiple of each of its factors Determine whether a given whole number is divisible by a given one digit number Determine whether a given whole number in the range of 1-100 is prime or composite		

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	Operations and Algebraic Thinking	**Introduced Skills** Generate two numerical patterns using two given rules Identify apparent relationships between corresponding terms Form ordered pairs consisting of corresponding terms from two patterns and graph the ordered pairs on a coordinate plane **Reviewed Skills** Identify apparent features of a pattern without a given rule **Introduced Skills** Explain the concept of a ratio Use ratio language to describe ratio relationship between two quantities Find a percent of a quantity as a rate per 100 (i.e. 30% of a [illegible]) **Introduced Skills** Explain that positive and negative numbers are used together to describe quantities having opposite directions of values Use positive and negative numbers to represent quantities in real-world contexts explaining the meaning of 0 in each situation Use a rational number as a point on the number line Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line Recognize that the opposite of the opposite of a number is the number itself Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane		

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	Operations and Algebraic Thinking	**Introduced Skills**		

	Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes
	Find and position pairs of integers and other rational numbers on a coordinate plane
	Explain ordering and absolute value of rational numbers
	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram
	Write, interpret and explain statements of order for rational numbers in real-world contexts (i.e. write -3□C > -7□C to express the fact that -3□C is warmer than -7□C)
	Describe the absolute value of a rational number as its distance from 0 on the number line
	Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation
	Apply and extend previous understandings to add and subtract rational numbers
	Represent addition and subtraction on a horizontal or vertical number line diagram
	Describe situations in which opposite quantities combine to make 0.
	Demonstrate 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 the sums of rational numbers by describing real-world contexts
	Demonstrate subtraction of rational numbers as using 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

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	Operations and Algebraic Thinking	**Introduced Skills** Apply and extend previous understandings of fractions to multiply and divide rational numbers Explain that integers can be divided provided that the divisor is not zero and every quotient of integers is a rational number Apply properties of operations as strategies to multiply and divide rational numbers in real world context Convert a rational number to a decimal using long division Recall that the decimal form of a rational number terminates in 0s or eventually repeats **Introduced Skills** Write and evaluate numerical expressions involving whole-number exponents Write, read and evaluate expressions in which letters stand for numbers Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient) while viewing one or more parts of an expression as a single entity Evaluate expressions with specific values of their variables **Reviewed Skills** Perform arithmetic operations including those involving whole number exponents in the conventional order when there are no parentheses to specify a particular order **Introduced Skills** Use variables to represent numbers and write expressions when solving a real-world problem, and solve Explain that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set		

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	Operations and Algebraic Thinking	**Reviewed Skills** Find and position integers and other rational numbers on a horizontal or vertical number line diagram **Introduced Skills** Write and evaluate numerical expressions involving whole-number exponents Write, read and evaluate expressions in which letters stand for numbers Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient) while viewing one or more parts of an expression as a single entity Evaluate expressions with specific values of their variables **Reviewed Skills** Perform arithmetic operations including those involving whole number exponents in the conventional order when there are no parentheses to specify a particular order **Introduced Skills** Use variables to represent numbers and write expressions when solving a real-world problem, and solve Explain that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set **Introduced Skills** Use variables to represent two quantities in a real-world problem that change in relationship to one another		

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<td>What patterns occur in our number system?

How do we graph ordered pairs?

What is a fraction?

How does multiplying fractions relate to real world problems?</td>
<td>Numbers and Operations in Base Ten

Understand the place value system

Perform operations with multi-digit whole numbers and with decimals to hundredths

Numbers and Operations – Fractions

Apply and extend previous understandings of multiplication and division to multiply and divide fractions</td>
<td>
Introduced Skills
<table>
<tr><td></td><td>Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations and/or the relationship between multiplication and division</td></tr>
<tr><td></td><td>Add, subtract, multiply and divide multi-digit decimals</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Illustrate and explain the calculation of a problem by using equations, rectangular arrays and/or area models</td></tr>
<tr><td></td><td>Add, subtract, multiply and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction</td></tr>
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Mastered Skills
<table>
<tr><td></td><td>Multiply one-digit whole numbers by multiples of 10 in the range 10-90</td></tr>
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Introduced Skills
<table>
<tr><td></td><td>Convert between improper fractions and mixed numbers</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Explain equivalence of fractions by attending to the number and size of the parts when two fractions themselves are the same size</td></tr>
<tr><td></td><td>Compare two fractions with different numerators and different denominators and justify the conclusions</td></tr>
<tr><td></td><td>Represent a fraction as a number on the number line</td></tr>
<tr><td></td><td>Compare fractions by using symbols of <, >, or =</td></tr>
<tr><td></td><td>Explain, represent and generate equivalent fractions</td></tr>
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<tr>
<td>Why do we simplify fractions?</td>
<td>Numbers and Operations – Fractions

Use equivalent fractions as a strategy to add and subtract fractions

Apply and extend previous understanding of multiplication and division to multiply and divide fractions.</td>
<td>
Introduced Skills
<table>
<tr><td></td><td>Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or</td></tr>
<tr><td></td><td>Multiply a fraction by a whole number or by a fraction</td></tr>
<tr><td></td><td>Describe a fraction a/b as a multiple of 1/b</td></tr>
<tr><td></td><td>Solve word problems involving multiplication of a fraction by a whole number</td></tr>
<tr><td></td><td>Use a fraction model or story to represent a problem using fractions.</td></tr>
<tr><td></td><td>Interpret a fraction as division of the numerator by the denominator</td></tr>
<tr><td></td><td>Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers</td></tr>
<tr><td></td><td>Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions</td></tr>
<tr><td></td><td>Solve problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Add and subtract mixed numbers with like denominators</td></tr>
<tr><td></td><td>Solve word problems involving addition and subtraction of fractions referring to the same whole, having like denominators and unlike denominators</td></tr>
</table>
Mastered Skills
<table>
<tr><td></td><td>Explain addition and subtraction of fractions as joining and separating parts referring to the same whole</td></tr>
<tr><td></td><td>Breakdown a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation</td></tr>
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<td>How do we convert measurements within systems?

How does 3-dimensional representation help us?

How do we represent the inside of a 3-dimensional figure?</td>
<td>Numbers and Operations – Fractions

MEASURE-MENT AND DATA

Measurement
Solve problems using measurement

Convert like measurement units within a given measurement system</td>
<td>
Introduced Skills
<table>
<tr><td></td><td>Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100 (i.e. express 3/10 as 30/100 and add 3/10+4/100=34/100</td></tr>
<tr><td></td><td>Convert between percent, decimals and fractions</td></tr>
</table>
Reviewed Skills
<table>
<tr><td></td><td>Use decimal notation for fractions with denominators 10 or 100 (i.e. rewrite 0.62 as 62/100; describe a length as 0.62 meters)</td></tr>
<tr><td></td><td>Compare two decimals to hundredths by reasoning about their size by using the symbols <, >, or = and justify the conclusion</td></tr>
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Introduced Skills
<table>
<tr><td></td><td>Convert among different-sized standard measurement units within a given measurement system</td></tr>
</table>
Reviewed Skills
<table>
<tr><td></td><td>Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit (i.e. Express the length of a 4 ft snake as 48 in.)</td></tr>
<tr><td></td><td>Generate a conversion table</td></tr>
<tr><td></td><td>Apply the area and perimeter formulas for rectangles in real world and mathematical problems (i.e. find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with</td></tr>
<tr><td></td><td>Measure and estimate liquid volumes and masses of objects using grams (g), kilograms (kg) and liters (l)</td></tr>
<tr><td></td><td>Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec, degrees</td></tr>
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ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	MEASURE-MENT AND DATA Represent and interpret data ***Time*** Work with time ***Money*** Work with money ***Data*** Represent and interpret data	**Mastered Skills** Use the four operations to solve word problems involving measurement units **Mastered Skills** Tell and write time to the nearest minute Measure time intervals in minutes Solve word problems involving addition and subtraction of time intervals in minutes Identify measurement of time in seconds **Mastered Skills** Solve problems involving dollar bills, quarters, dimes, nickels and pennies Use $ and ¢ symbols appropriately Show how different combinations of coins equal the same **Reviewed Skills** Solve problems by using line plots Show data with a picture graph and a bar graph **Mastered Skills** Represent a data set with several categories on a scaled picture graph and a scaled bar graph		

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	MEASURE-MENT AND DATA Represent and interpret data ***Geometric Shapes*** Explain and use geometric measurements Convert like measurement units within a given measurement system Understand concepts of volume and relate volume to multiplication and addition	**Introduced Skills** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes while applying the context of real-world problems Know the formulas for the area and circumference of a circle and use them to solve problems Recognize angle measure as additive Solve addition and subtraction problems to find unknown angles on a diagram in real world 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 Recognize volume as an attribute of solid figures Describe and use concepts of volume measurement Measure volumes by counting unit cubes using cubic cm, in, ft and improvised unites Relate volume to the operations of multiplication and addition with three dimensional figures Solve real world problems involving volume Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems Find the missing measurement in triangles and quadrilaterals		

ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	MEASURE-MENT AND DATA Represent and interpret data ***Geometric Shapes*** Explain and use geometric measurements Understand concepts of volume and relate volume to multiplication and division	**Reviewed Skills** Find the perimeter of a polygon given the side lengths, an unknown side length, same perimeters and different areas, and same area and different perimeter Find the areas of complex figures Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint Describe and use concepts of angle measurement Measure and sketch angles in whole-number degrees using a protractor Solve real-world problems involving perimeters of polygons Recognize areas as an attribute of plane figures Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b+c is the sum of a x b and a x c Explain concepts of area measurement **Mastered Skills** Relate area to the operations of multiplication and addition Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world problems Recognize area as additive		

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<tr>
<td>How do we graph ordered pairs?

What are the properties of 2-dimensonal figures?</td>
<td>Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems

Classify two-dimensional figures into categories based on their properties</td>
<td>
Introduced Skills
<table>
<tr><td></td><td>Classify two-dimensional figures in a hierarchy based on properties</td></tr>
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Reviewed Skills
<table>
<tr><td></td><td>Identify angles and lines in two-dimensional figures</td></tr>
<tr><td></td><td>Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or angles of specified size</td></tr>
<tr><td></td><td>Recognize and identify right triangles as a category</td></tr>
<tr><td></td><td>Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts</td></tr>
<tr><td></td><td>Identify line-symmetric figures and draw lines of symmetry</td></tr>
<tr><td></td><td>Draw points, lines, line segments, rays, angles and perpendicular and parallel lines</td></tr>
</table>
Mastered Skills
<table>
<tr><td></td><td>Show understanding that shapes in different categories (i.e. rhombus and rectangle) may share attributes (i.e. four sides) and that the shared attributes can define a larger category (i.e. quadrilaterals)</td></tr>
<tr><td></td><td>Express the area of the parts of a whole shape as unit fractions</td></tr>
<tr><td></td><td>Compose new shapes from composite shapes</td></tr>
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ESSENTIAL QUESTIONS	DOMAINS AND CLUSTERS	5th GRADE MATH SKILLS	VOCABULARY	PRACTICES, RESOURCES & ASSESSMENT
	Geometry Graph points on the coordinate plane to solve real-world and mathematical problems Classify two-dimensional figures into categories based on their properties	**Introduced Skills** Use a pair of perpendicular number lines (axes) to define a coordinate system with the intersection of the lines (origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers (coordinates) Explain that the first number in a coordinate indicates how far to travel from the origin in the direction of one axis and the second number indicates how far to travel in the direction of the second axis Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane Interpret coordinate values of points in the context of the situation		