

**Grade 7 Math (Master)**

	<b>Essential Questions</b>	<b>Content</b>	<b>Skills</b>
<b>Fall</b>	<p><b>Number Sense</b> Why is it important to differentiate between various multiplication methods?</p> <p>How can a procedure lead you to an accurate solution?</p> <p>Why do we need integers?</p> <p><b>Patterns/Functions/Algebraic Thinking</b> How is a variable useful in writing a number pattern?</p> <p><b>Geometry</b> Where does the coordinate system exist in daily life?</p>	<p>A. Variable Expressions</p> <p>B. Powers and Exponents</p> <p>C. Order of Operations</p> <p>D. Integers and Absolute Value</p> <p>E. Coordinate Mapping</p>	<p>A. <b>Write</b> variable expressions</p> <p>A. <b>Evaluate</b> variable expressions</p> <p>A. <b>Evaluate</b> and substitute variables in expressions</p> <p>A. <b>Model</b> verbal expressions as algebraic expressions</p> <p>A. <b>Apply</b> a problem-solving plan to verbal story problems</p> <p>-verbal model</p> <p>-assign values</p> <p>-algebraic model</p> <p>-solve the equation</p> <p>-answer the question</p> <p>-Is the answer reasonable?</p> <p>B. <b>Apply</b> powers to describe repeated edition</p> <p>B. <b>Evaluate</b> variable expressions with exponents</p> <p>C. <b>Evaluate</b> expressions using order of operations</p> <p>D. <b>Simplify/evaluate</b> expressions with integers using the four basic operations</p> <p>D. <b>Calculate</b> absolute value within an expression</p> <p>E. <b>Identify</b> points on a coordinate plane</p> <p>E. <b>Plot</b> points on a coordinate plane</p>
	<p><b>Number Sense</b></p> <p>How do mathematical properties make calculations easier?</p> <p>When is it necessary to have more than one solution?</p> <p>Patterns/Functions/Algebraic Thinking Where do unknown values exist in real life?</p> <p>How can solving equations be useful in real life?</p>	<p>A. Properties &amp; Operations</p> <p>B. Variable Expressions</p> <p>C. Variable Equations</p> <p>D. Variable Inequalities</p>	<p>A. <b>Identify</b> and utilize the commutative, associative, zero and identity properties of addition &amp; multiplication</p> <p>A. <b>Identify</b> and utilize the distributive property</p> <p>A. <b>Convert</b> units of measure using the identity property of multiplication</p> <p>B. <b>Identify</b> parts of an expression</p> <p>B. <b>Apply</b> the commutative, associative, and identity properties of addition &amp; multiplication when simplifying variable expressions</p> <p>B. <b>Apply</b> the distributive property when simplifying variable expressions</p> <p>C. <b>Solve</b> one-step equations using inverse operations</p> <p>C. <b>Differentiate</b> solving equations and evaluating expressions</p> <p>C. <b>Solve</b> Multi- step equations using inverse operations, distributive property and combining like terms</p>

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			<p>D. <b>Solve</b> one-step inequalities using inverse operations</p> <p>D. <b>Graph</b> inequalities on a number line</p> <p>D. <b>Solve</b> Multi- step inequalities using inverse operations, distributive property and combining like terms</p>
	<p><b>Number Sense</b> How can factors lead us to more complex values?</p> <p>Why were fractions developed?</p> <p>Why is it important to differentiate between various multiplication methods?</p>	<p>A. Factors</p> <p>B. Fractions</p> <p>C. Exponents</p>	<p>A. <b>Factor</b> numbers and monomials</p> <p>A. <b>Find</b> common factors and common multiples</p> <p><b>B. Simplify, ordering and comparing</b> fractions</p> <p>C. <b>Multiply and divide</b> powers</p> <p>C. <b>Write</b> numbers in scientific notation</p>
<b>Winter</b>	<p><b>Number Sense</b> In what ways can we illustrate distribution of numbers?</p> <p>How does a budget help us to make decisions?</p> <p><b>Measurement</b> How can area and perimeter be applied in the real world?</p>	<p>A. Spreadsheets and Graphs</p> <p>B. Area and Perimeter</p> <p>C. Digital presentations</p> <p>D. Real world scenarios</p> <p>E. Budgets</p>	<p>A. <b>Create</b> a spreadsheet</p> <p>A. <b>Understand</b> cells, columns, and rows</p> <p>A. <b>Apply</b> cell formulas for calculating product costs, sales tax, commissions, total expenses, and budget surplus/deficit</p> <p>A. <b>Format</b> cells</p> <p>A. <b>Utilize</b> the graph wizard function of an Excel spreadsheet</p> <p><b>B. Calculate</b> area and perimeter</p> <p>B. Recognize area as the product of length and width</p> <p>B. Find surface area of a given room</p> <p>B. Utilize strategies to calculate irregular surface areas</p> <p>B. Recognize perimeter as the distance around a polygon</p> <p>B. Calculate the perimeter of a irregular room</p> <p><b>C. Use</b> Digital Presentations</p> <p>C. <b>Understand</b> and apply basic operations of MS PowerPoint</p> <p>C. <b>Understand and apply</b> basic operations of iMovie</p> <p>C. <b>Understand</b> and apply basic operations of Adobe Photoshop</p> <p><b>D. Apply</b> percents</p> <p>D. <b>Calculate</b> sales tax</p> <p>D. <b>Calculate</b> percent commission</p> <p>D. <b>Calculate</b> percent of a budget</p> <p><b>E. Develop</b> a budget</p> <p>E. <b>Create</b> an operational budget and meeting given goals within that budget</p>

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	<p><b>Number Sense</b> How can divisibility rules help us to determine the greatest factor two numbers have in common?</p> <p>Where do we see fractions in the real world?</p>	<p>A. Number Theory -prime/composite numbers -greatest common factor -least common factor</p> <p>B. Fractions - numerical - algebraic</p>	<p>A. <b>Define</b> prime and composite numbers -Compute the first 25 prime numbers -Sieve of Eratosthenes</p> <p>A. <b>Review</b> divisibility Rules (2,3,4,5,6,8,9,10) A. <b>Calculate</b> Greatest Common Factor A. <b>List</b> factors - prime factorization -"Ladder Method"</p> <p>A. <b>Calculate</b> Least Common Multiple A. <b>List</b> factors -"Ladder Method"</p> <p>B. <b>Recognize</b> rational and irrational numbers B. <b>Simplify and compare</b> fractions B. <b>Calculate</b> numerical fractions with like and unlike denominators (improper and mixed) -Addition -Subtraction -Multiplication -Division B. <b>Experiment</b> with algebraic fractions -Simplify -Addition -Subtraction -Multiplication -Division</p> <p>B. <b>Solve</b> one and two step equations, involving fractions</p>
	<p><b>Number Sense</b> How can rates be used in daily life?</p> <p><b>Patterns/Functions/Algebraic Thinking</b> How are fractions, decimals and percents related?</p> <p>What does it mean to be "proportionate"?</p>	<p>A. The Real Number System -rational and irrational numbers -categories of decimals -repeating -terminating -non terminating, non-repeating</p> <p>B. Rates, Ratios, and Proportions</p> <p>C. Probability -Theoretical -Experimental</p>	<p>A. <b>Distinguish</b> between rational and irrational numbers A. <b>Explore</b> the relationship between percents, decimals, and fractions A. <b>write</b> a fraction as a decimal and percent A. <b>write</b> a decimal as a fraction and percent A. <b>write</b> a percent as a decimal and fraction A. <b>Compute</b> percents less than one and greater than one hundred</p> <p>B. <b>Determine</b> the relationship between different units of measure B. <b>Apply</b> ratios to word problems -relationship between the same units of measure B. <b>Apply</b> proportions to word problems -the relationship between two rates or two ratios</p>

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			<p>B. <b>Solve</b> proportions using the cross product property</p> <p>B. <b>Solve</b> percent problems using proportions</p> <p>B. <b>Apply</b> the understanding of rates, ratios, and proportions toward real world problem solving.</p> <p>C. <b>Compare and Contrast</b> Theoretical versus Experimental Probability</p> <p>C. <b>Experiment</b> with probability of dependent events</p> <p>C. <b>Experiment</b> with probability of independent events</p>
<b>Spring</b>	<p><b>Patterns/Functions/Algebraic Thinking</b> How is squaring a value and finding the square root of a value different?</p> <p>What are some historical examples of inequality and how can we use them to understand mathematical inequalities?</p> <p><b>Geometry</b> How do the three sides of a triangle relate to each other?</p>	<p>A. Exploring Square Roots</p> <p>B. The Real Number System -rational numbers -irrational numbers</p> <p>C. The Pythagorean Theorem</p> <p>D. Inequalities</p>	<p>A. <b>Recognize</b> positive and negative square roots</p> <p>A. <b>Solve</b> equations with square roots</p> <p>B. <b>Recognize</b> the Real Number System -Rational Numbers -Terminating or repeating - Integers -Whole Numbers -Natural (Counting) Numbers -Irrational Numbers (non-terminating and non-repeating)</p> <p>C. <b>Identify</b> legs and hypotenuse of a right angled triangle</p> <p>C. <b>Use</b> the Pythagorean Theorem to find the length of a missing side of a right triangle</p> <p>C. <b>Apply</b> the Pythagorean Theorem in real world application</p> <p>D. <b>Compare and contrast</b> solutions versus solution sets</p> <p>D. <b>Recognize</b> a solution range</p> <p>D. <b>Solve</b> inequality statements</p> <p>D. <b>Apply</b> the specific algorithm necessary to solve inequality statements reverse the inequality symbol</p> <p>D. <b>Graph</b> solutions of inequality on a number line</p>
	<p><b>Geometry</b> Where do you see shapes in the world around you?</p> <p>How are angles related to the sides that create them?</p> <p>What does it mean to "mirror" and image in math?</p> <p>What characteristics are necessary for shapes to</p>	<p>A. Geometry: Points, Lines, and Planes</p> <p>B. Geometry: Angles</p> <p>C. Geometry: Parallel Lines</p> <p>D. Symmetry</p> <p>E. Triangles</p> <p>F. Quadrilaterals</p>	<p>A. <b>Plot</b> points</p> <p>A. <b>Define</b> lines as a straight series of points</p> <p>A. <b>Recognize</b> planes as a two dimensional figure continuing infinitely in all directions</p> <p>B. <b>Name</b> angles</p> <p>B. <b>Define</b> the different angles -acute angles -obtuse angles -right angles -straight angles</p>

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	<p>be defined?</p>	<p>G. Polygons and Congruence</p> <p>H. Polygons and their Angles</p> <p>I. Angle Side Relationship</p>	<p>-reflex</p> <p><b>B. Estimate</b> angles and measuring angles with protractor</p> <p><b>B. Understand</b> congruence notation of side length and angle measurement</p> <p><b>C. Use</b> parallel lines and their transversal to calculate:</p> <ul style="list-style-type: none"> <li>-identical slope</li> <li>-vertical angles</li> <li>-corresponding angles</li> </ul> <p><b>D. Identify</b> symmetry</p> <ul style="list-style-type: none"> <li>-linear symmetry</li> <li>-horizontal</li> <li>-vertical</li> <li>-rotational Symmetry (degree of symmetry)</li> </ul> <p><b>E. Classify</b> Triangles</p> <ul style="list-style-type: none"> <li>- by side (isosceles, equilateral, scalene)</li> <li>-by angle (acute, obtuse, right, equiangular)</li> </ul> <p><b>F. Classify</b> Quadrilaterals by definition</p> <ul style="list-style-type: none"> <li>-parallelogram</li> <li>-Rectangles</li> <li>-Squares</li> <li>-Rhombus</li> <li>-Kite</li> <li>-Trapezoid</li> <li>-Scalene</li> </ul> <p><b>G. Recognize</b> Congruent Polygons</p> <ul style="list-style-type: none"> <li>-congruent sides</li> <li>-congruent angles</li> </ul> <p><b>G. Define</b> regular polygon</p> <p><b>G. Apply</b> understanding of characteristics of regular polygons to solve for a missing angle or side.</p> <p><b>H. Calculate</b> the exterior angles of any polygon</p> <p><b>H. Calculate</b> the interior angles of any polygon</p> <p><b>I. Recognize</b> the angle side relationships of a given triangle</p> <p><b>I. Apply</b> understanding of angle side relationship to calculate the missing side of a given triangle</p>
	<b>Geometry</b>	A. Area and Perimeter	A. <b>Apply</b> Area Formulas

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<p>How is a polygon's characteristics affected by changing one or more dimension?</p> <p>Why is it important to understand the difference between similar shapes and congruent shapes?</p>	<p>B. Linear Reflection</p> <p>C. Rotations</p> <p>D. Translations</p> <p>E. Similar Polygons</p> <p>F. Circles</p> <p>G. Polyhedrons</p> <p>H. Surface Area</p>	<p>-Triangle - Rectangle -Square -Parallelogram -Trapezoid</p> <p>A. <b>Apply</b> understanding of known area formulas to calculate area of irregular figure A. <b>Calculate</b> perimeter of irregular and regular polygons</p> <p>B. <b>Reflect</b> a figure in a line B. <b>Reflect</b> a figure in a coordinate plane B. <b>Recognize</b> a line of symmetry B. <b>Identify</b> a pattern of reflection -recognize the relationship between the x and y coordinates when reflecting between quadrants</p> <p>C. <b>Identify</b> and estimate an angle of rotation C. <b>Identify</b> a pattern of rotation -recognize the relationship between the x and y coordinates when reflecting between quadrants</p> <p>D. <b>Translate</b> a figure in a coordinate plane</p> <p>E. <b>Recognize</b> properties of similar figures -congruent angles, proportional sides E. <b>Apply</b> an understanding of similar figures to solve real world problems E. <b>Create</b> a dilated figure</p> <p>F. <b>Recognize</b> the integral parts of a circle F. <b>Describe</b> the relationships between circumference, diameter, radius, and pi F. <b>Solve</b> for the missing component when given the circumference, diameter, or radius F. <b>Solve</b> for the missing component when given the area, radius, or diameter</p> <p>G. <b>Identify</b> specific polyhedrons and solids - prisms -pyramids -cones -cylinders -spheres -irregular solids</p>

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			<p>G. <b>Determine</b> a given polyhedron given its net</p> <p>H. <b>Calculate</b> surface area using the given formula -prisms -cylinders</p> <p>H. <b>Identify</b> faces, edges and vertices</p> <p>H. <b>Apply</b> surface area understanding to calculate surface area of a tangible item</p>
	<p><b>Patterns/Functions/Algebraic Functions</b> How can linear relationships be used to make decisions?</p> <p>How is slope determined?</p> <p>How can we illustrate visually a linear equation?</p> <p><b>Measurement</b> How can we apply volume in the real world?</p>	<p>A. Volume</p> <p>B. Linear Equations</p> <p>C. Intercepts of a linear graphs</p> <p>D. Slope</p>	<p>A. <b>Determine</b> the appropriate formula to calculate the volume of a given solid - prisms -cylinder -pyramid -cone -sphere</p> <p>A. <b>Write</b> the meaning of cubic units</p> <p>A. <b>Calculate</b> the volume of a given tangible solid</p> <p>B. <b>Recognize</b> the solution to a system of linear equations to be a solution set</p> <p>B. <b>Determine</b> if a linear solution set falls on a single line</p> <p>B. <b>Relate</b> the coordinate plane to the solutions set of a linear equation</p> <p>B. <b>Draw</b> a linear solution set through a table of ordered pairs</p> <p>C. <b>Identify</b> the intercepts of a linear graph</p> <p>C. <b>Sketch</b> a linear graph using the intercepts</p> <p>D. <b>Identify</b> the slope of a line</p> <p>D. <b>Calculate</b> the slope as the rate of change -rise over run -change in y over the change in x</p> <p>D. <b>Recognize</b> the slope of a vertical line (no slope)</p> <p>D. <b>Calculate</b> the slope of a horizontal line (zero)</p> <p>D. <b>Recognize</b> positive and negative slopes both graphically and algebraically</p>