

Danvers Public Schools
Pacing Guide 2009 – 2010
2nd Edition of Investigations in Number, Data, and Space
Grade 5

Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>Unit 1: Number Puzzles and Multiple Towers (Multiplication and Division 1)</p> <p>Standards: 5.N.8 5.N.9 5.N.10 5.N.12 5.N.14 5.P.2* 5.P.3</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Quick Images • Number Puzzles 	<p>5.N.8 Apply the number theory concepts of common factor, common multiple, and divisibility rules for 2, 3, 5, and 10 to the solution of problems. Demonstrate an understanding of the concepts of prime and composite numbers.</p> <p>5.N.9 Solve problems involving multiplication and division of whole numbers, and multiplication of positive fractions with whole numbers.</p> <p>5.N.10 Demonstrate an understanding of how parentheses affect expressions involving addition, subtraction, and multiplication, and use that understanding to solve problems, e.g., $3 \times (4 + 2) = 3 \times 6$.</p> <p>5.N.12 Accurately and efficiently add and subtract whole numbers and positive decimals. Multiply and divide (using double-digit divisors) whole numbers. Multiply positive decimals with whole numbers.</p>	<p>Array Associative property Composite #s Distributive property Dividend Division Divisor Factor Greater than Less than Multiple Prime factorization Prime number Product Quotient Square Number</p>	<ul style="list-style-type: none"> • Session 1.5: <i>Number Puzzles and Finding Factors</i> • Session 2.7: <i>What Is The Answer?</i> <p>Due October 14</p> <ul style="list-style-type: none"> • Session 3.8: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 4, # 18, # 33, # 35, # 38 • 2007: # 13, # 19, # 23, # 25, # 32, # 34, # 37

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| | | <p>5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.</p> <p>5.P.2 *Replace variables with given values and evaluate/simplify, e.g., $2(\bigcirc) + 3$ when $\bigcirc = 4$.</p> <p>5.P.3 Use the properties of equality to solve problems with whole numbers, e.g., if $\square + 7 = 13$, then $\square = 13 - 7$, therefore $\square = 6$; if $3 \times \square = 15$, then $\square = 15 \div 3$, therefore $\square = 5$.</p> | | |
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Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>Unit 2: Prisms and Pyramids (3-D Geometry and Measurement)</p> <p>Standards: 5.G.2 5.N.14</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3 (see 3rd grade E-O-U Assessment question)</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Quick Images: 3-D • Estimation and Number Sense • What's (Guess) My Shape 	<p>5.G.2 Identify, describe, and compare special types of three-dimensional shapes (cubes, prisms, spheres, pyramids) based on their properties, such as edges and faces.</p> <p>5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.</p>	<p>Cone Cubic centimeter Cubic meter Cylinder Dimension Edges Faces Height Length Linear Multiple Pyramid Rectangular prism Vertex Volume Width</p>	<ul style="list-style-type: none"> • Session 1.5: <i>Finding the Volume of Rectangular Prisms</i> • Session 2.4: <i>Measuring Volume in Cubic Centimeters</i> <p>Due November 9:</p> <ul style="list-style-type: none"> • Session 3.5: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 28 • 2007: # 12, # 17

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<p>Unit 3: Thousands of Miles, Thousands of Seats (Addition, Subtraction, and the Number System)</p> <p>Standards:</p> <p>5.N.2 5.N.3** 5.N.6*** 5.N.7 5.N.11 5.N.12 5.N.14</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p>Supplemental Activity Master 3 (Place Value Larger numbers)</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Practicing Place Value • Estimation and Number Sense: Closest Estimate 	<p>5.N.2 Demonstrate an understanding of place value through millions and thousandths.</p> <p>5.N.3 Represent and compare large (millions) and small (thousandths) positive numbers in various forms, such as **expanded notation without exponents, e.g., $9724 = 9 \times 1000 + 7 \times 100 + 2 \times 10 + 4$.</p> <p>5.N.6 ***Find and position whole numbers, positive fractions, positive mixed numbers, and positive decimals on a number line.</p> <p>5.N.7 Compare and order whole numbers, positive fractions, positive mixed numbers, positive decimals, and percents.</p> <p>5.N.11 Demonstrate an understanding of the inverse relationship of addition and -subtraction, and use that understanding to simplify computation and solve problems.</p>	<p>Algorithm Billion Million Trillion</p>	<ul style="list-style-type: none"> • Session 1.2: <i>Numbers on the 10,000 Chart</i> • Session 2.5: <i>Subtraction Problems</i> • Session 3.1: <i>Division Facts and Close to 7,500</i> • Session 3.3: <i>Numbers to 100,000 and Rock On!</i> <p>Due December 9 Session 3.5: <i>End-of-unit assessment</i></p> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 8, # 25, # 26, # 32 • 2007: # 2, # 14, # 39

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		<p>5.N.12 Accurately and efficiently add and subtract whole numbers and positive decimals. Multiply and divide (using double-digit divisors) whole numbers. Multiply positive decimals with whole numbers.</p> <p>5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.</p>		

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<p>Unit 4: What’s That Portion? Fractions and Percents</p> <p>Standards: 5.N.4 5.N.5 5.N.6 5.N.7 5.N.9* 5.N.13* 5.N.14</p> <p>During this chapter look for opportunities to represent fractions on a number line (5.N.4). Some teachers effectively use string and clothespins to “pin” $\frac{1}{2}$, $\frac{1}{4}$ in their appropriate places between 0 and 1.</p> <p>[Using a ruler (number line) for locating fractions is another opportunity to model a number line.]</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Guess My Rule • Estimation and Number Sense 	<p>5.N.4 Demonstrate an understanding of fractions as a ratio of whole numbers, as parts of unit wholes, as parts of a collection, and as locations on the number line.</p> <p>5.N.5 Identify and determine common equivalent fractions (with denominators 2, 4, 5, 10) and mixed numbers (with denominators 2, 4, 5, 10), decimals, and percents (through one hundred percent), e.g., $\frac{3}{4} = 0.75 = 75\%$.</p> <p>5.N.6 Find and position whole numbers, positive fractions, positive mixed numbers, and positive decimals on a number line.</p> <p>5.N.7 Compare and order whole numbers, positive fractions, positive mixed numbers, positive decimals, and percents.</p> <p>5.N.9 *Solve problems involving multiplication and division of whole numbers, and *multiplication of positive fractions with whole numbers.</p>	<p>Decimal Equivalent Fraction Ratio Percent Numerator Denominator Simplify</p>	<ul style="list-style-type: none"> • Session 1.5: <i>Solving Problems with Fractions and Percents</i> • Session 2.6: <i>Using Fractions and Percents</i> • Session 3.3: <i>Adding Fractions</i> <p>Due January 21:</p> <ul style="list-style-type: none"> • Session 3.10: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: #6, # 9, # 13, # 16, # 20, # 23 • 2007: # 8, # 35

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5.N.13 Accurately and efficiently add and subtract positive fractions and mixed numbers with like denominators and with unlike denominators (2, 4, 5, 10 only); ****multiply positive fractions with whole numbers.** Simplify fractions in cases when both the numerator and the denominator have 2, 3, 4, 5, or 10 as a common factor.

5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.

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Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>Unit 5: Measuring Polygons (2-D Geometry and Measurement)</p> <p>Standards: 5.G.1 5.G.2 5.G.3* 5.G.5** 5.G.6*** 5.G.7**** 5.M.1***** 5.M.2 5.M.3***** 5.M.4 5.M.5</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p>Supplemental Activity Master 13 lines</p> <p>Supplemental Activity Master 21 Surface area</p> <p>Supplemental Activity Masters 24 & 25 transformations</p> <p>Supplemental Activity Master 26 congruence</p> <p>Supplemental Activity Master 27 symmetry</p>	<p>5.G.1 Identify, describe, and compare special types of triangles (isosceles, equilateral, right) and quadrilaterals (square, rectangle, parallelogram, rhombus, trapezoid), e.g., recognize that all equilateral triangles are isosceles, but not all isosceles triangles are equilateral.</p> <p>5.G.2 Determine if two triangles or two quadrilaterals are congruent by measuring sides or a combination of sides and angles, as necessary; or by motions or series of motions, e.g., translations, rotations, and reflections.</p> <p>5.G.3 Identify relationships among points and lines, e.g., *intersecting, parallel, perpendicular.</p> <p>5.G.5 **Describe and perform transformations on two-dimensional shapes, e.g., translations, rotations, and reflections.</p> <p>5.G.6 ***Identify and describe line symmetry in two-dimensional shapes, including shapes that have multiple lines of symmetry.</p>	<p>Polygon Line segment Interior angles Exterior angles Right triangle Scalene triangle Equilateral triangle Isosceles triangle Quadrilateral Square Rectangle Parallelogram Rhombus Trapezoid Parallel lines Perpendicular lines Intersecting lines Translations (slides) Rotations (turns) Reflections - (flips) Surface Area Symmetry Congruent Area Perimeter Supplementary Obtuse angle Right angle Acute angle Point</p>	<ul style="list-style-type: none"> • Session 1.7: <i>Quadrilaterals and Angles</i> • Session 2.6: <i>Perimeter and the Area of Rectangles</i> <p>Due February 26:</p> <ul style="list-style-type: none"> • Session 3.5: <i>End-of-unit assessment, question 1 & 2 only</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 12, # 14, # 17, # 19, # 31, # 34, # 37 • 2007: # 3, # 5, # 18, # 21, # 27, # 30

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<p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Quick Images: 2-D • Quick Survey 	<p>5.M.1 Apply the concepts of perimeter and area to the solution of problems involving *****triangles and rectangles. Apply formulas where appropriate.</p> <p>5.M.2 Identify, measure, describe, classify, and draw various angles. Draw triangles given two sides and the angle between them, or given two angles and the side between them, e.g., draw a triangle with one right angle and two sides congruent.</p> <p>5.M.3 *****Solve problems involving simple unit conversions within a system of measurement.</p> <p>5.M.4 Find volumes and surface areas of rectangular prisms.</p> <p>5.M.5 Find the sum of the measures of the interior angles in triangles by measuring the angles, and without measuring the angles.</p>	<p>NOTATION $\angle ABC$ angle ABC where the middle letter is the vertex of the \angle.</p> <p>\overline{AB} where AB is a line segment with endpoints A and B</p> <p>ABCD Quadrilateral ABCD where A, B, C, and D are the vertices of the polygon</p>	
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Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>Unit 6: Decimals on Grids and Number Lines (Decimals, Fractions, and Percent 2)</p> <p>Standards: 5.N.2 5.N.3* 5.N.5 5.N.6 5.N.7 5.N.12 5.N.14</p> <p>Mathematical Emphasis (cont.) 5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Practicing Place Value • Estimation and Number Sense 	<p>5.N.2 Demonstrate an understanding of place value through millions and thousandths.</p> <p>5.N.3 Represent and compare large (millions) and small (thousandths) positive numbers in various forms, such as *expanded notation without exponents, e.g., $9724 = 9 \times 1000 + 7 \times 100 + 2 \times 10 + 4$.</p> <p>5.N.5 Identify and determine common equivalent fractions (with denominators 2, 4, 5, 10) and mixed numbers (with denominators 2, 4, 5, 10), decimals, and percents (through one hundred percent), e.g., $\frac{3}{4} = 0.75 = 75\%$.</p> <p>5.N.6 Find and position whole numbers, positive fractions, positive mixed numbers, and positive decimals on a number line.</p> <p>5.N.7 Compare and order whole numbers, positive fractions, positive mixed numbers, positive decimals, %.</p> <p>5.N.12 Accurately and efficiently add and subtract whole numbers and positive decimals. Multiply and divide (using double-digit divisors) whole numbers. Multiply pos. decimals w. whole nos.</p>	<p>Fraction Decimal Percent Equivalent Not equivalent Tenths Hundredths Thousandths Numerator Denominator</p>	<ul style="list-style-type: none"> • Session 1.5: <i>Decimal Problems</i> • Session 1.10: <i>Comparing and Ordering Decimals</i> <p>Due March 26:</p> <ul style="list-style-type: none"> • Session 2.8: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 36 • 2007: # 4, # 22, # 28, # 33

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Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>Unit 7: How Many People? How Many Teams? (Multiplication and Division 2)</p> <p>Standards: 5.N.9 5.N.10 5.N.12* 5.N.14** 5.N.1 5.P.3</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p>Supplemental Activity Master 38 Exponents/Powers of ten</p> <p>Supplemental Activity Order of Operations</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Estimation and Number Sense: Closest Estimate • Number Puzzles 	<p>5.N.9 Solve problems involving multiplication and division of whole numbers, and multiplication of positive fractions with whole nos.</p> <p>5.N.10 Demonstrate an understanding of how parentheses affect expressions involving addition, subtraction, multiplication and use that understanding to solve problems e.g. $3 \times (4+2) = 3 \times 6$.</p> <p>5.N.12 Accurately and efficiently add and subtract whole numbers and positive decimals. Multiply and divide (using double-digit divisors) whole numbers. *Multiply positive decimals with whole numbers.</p> <p>5.N.14 Estimate sums and differences of whole numbers, positive fractions, and positive decimals. **Estimate products of whole numbers and products of positive decimals with whole numbers. Use a variety of strategies and judge the reasonableness of the answer.</p> <p>5.N.1 *Demonstrate an understanding of (positive integer) powers of ten, e.g., 10^2, 10^5.</p> <p>5.P.3 Use the properties of equality to solve problems with whole numbers, e.g., if $\square + 7 = 13$, then $\square = 13 - 7$, therefore $\square = 6$; if $3 \times \square = 15$, then $\square = 15 \div 3$, therefore $\square = 5$.</p>	<p>Algorithm Exponent Expression Factor Power Order of Operations Parentheses Product Root</p>	<ul style="list-style-type: none"> • Session 1.1: <i>Equivalence in Multiplication</i> • Session 2.4: 253×46 • Session 3.7: $701 - 27$ <p>Due May 6:</p> <ul style="list-style-type: none"> • Session 4.5: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 11, # 29, # 38 • 2007: # 16, # 37

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Unit Name	Essential Lessons	Mathematical Emphasis	Vocabulary	Assessments
<p>5-8: Growth Patterns (Patterns, Functions, and Change)</p> <p>Standards: 5.N.10 5.P.1 5.P.4 5.P.5 5.P.6 5.G.4 5.D.2</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Estimation and Number Sense • Practicing Place Value 	<p>5.N.10 Demonstrate an understanding of how parentheses affect expressions involving addition, subtraction, and multiplication, and use that understanding to solve problems, e.g., $3 \times (4 + 2) = 3 \times 6$.</p> <p>5.P.1 Analyze and determine the rules for extending symbolic, arithmetic, and geometric patterns and progressions, e.g., ABBCCC; 1, 5, 9, 13...; 3, 9, 27...</p> <p>5.P.4 Represent real situations and mathematical relationships with concrete models, tables, graphs, and rules in words and with symbols, e.g., input-output tables.</p> <p>5.P.5 Solve problems involving proportional relationships using concrete models, tables, graphs, and paper-pencil methods.</p> <p>5.P.6 Interpret graphs that represent the relationship between two variables in everyday situations.</p> <p>5.G.4 Using ordered pairs of whole numbers (including zero), graph, locate, and identify points, and describe paths on the Cartesian coordinate plane.</p> <p>5.D.2 Construct and interpret line plots, line graphs, and bar graphs. Interpret and label circle graphs.</p>	<p>Graph</p> <p>Greater Pattern</p> <p>Repeating pattern</p> <p>Rate of change</p> <p>Steady rate</p> <p>Steepness</p> <p><u>NOTATION</u> "$2x$" "$4n$" where 2 and 4 are numbers (coefficients) that are multiplied by the variables x and n respectively</p>	<ul style="list-style-type: none"> • Session 1.4: <i>Comparing Animals' Growth</i> <p>Due June 2:</p> <ul style="list-style-type: none"> • Session 2.8: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: # 2, # 5, # 7, # 21, # 24 #, # 27, # 39 • 2007: # 1, # 6, #9, # 15, # 20, # 24, # 31, # 38

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<p>Unit 9: How Long Can You Stand on One Foot? (Data Analysis and Probability)</p> <p><u>Measures of Center</u> Look for opportunities to include questioning about the mode and mean of the sets of data presented.</p> <p>Standards: 5.D.1* 5.D.2* 5.D.3</p>	<p>Investigation 1</p> <p>Investigation 2</p> <p>Investigation 3</p> <p>Supplemental Activities on Mean and Mode.</p> <p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> • Quick Survey • “What is Likely” (can use before MCAS) • Estimation and Number Sense: Closest Estimate 	<p>5.D.1 *Given a set of data, find the median, mean, mode, maximum, minimum, and range, and apply to solutions of problems.</p> <p>5.D.2 **Construct and interpret line plots, line graphs, and bar graphs. Interpret and label circle graphs.</p> <p>5.D.3 Predict the probability of outcomes of simple experiments (e.g., tossing a coin, rolling a number cube) and test the predictions.</p>	<p>Probability Line graph Line plot Data Range Mean Median Mode Maximum Minimum Circle graph</p>	<ul style="list-style-type: none"> • Session 2.1: <i>Students’ Experiment Project and Designing an Experiment</i> • Session 2.2: <i>Analyzing the Data</i> <p>Due June 23:</p> <ul style="list-style-type: none"> • Session 3.5: <i>End-of-unit assessment</i> <p>Integrate these grade 5 MCAS questions into unit:</p> <ul style="list-style-type: none"> • 2006: #3, # 10, # 15, # 30 • 2007: # 7, # 10, # 11, #26, # 36 • 2008 #10, #7, #38