

### 4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township

Purpose Statement					
<p>The purpose of this scope and sequence document is to ensure that MSD of Pike Township has a viable and guaranteed Mathematics curriculum. It is meant to provide the foundational skills, strategies, and concepts necessary for our students to leave Pike Township college and career ready. Please remember that this scope and sequence is based on the Indiana Academic Standards and the typical progress of students. Use your professional judgment when addressing the individual needs of your students. If you need to shorten or lengthen a unit, then do so based on mastery of standards, evidence from your classroom assessments and professional observations. Always consider the students' need and interest as well as social studies and science content area topics to guide your units of study. Collaborate with your instructional coach and school librarian to plan and implement the units of study, mini-lesson ideas, and instructional resources.</p>					
Components Included in the Scope and Sequence					
<p style="text-align: center;"><u>Mathematics Content</u></p> <p>As you work with your students, please remember the following:</p> <ul style="list-style-type: none"> <li>• Students are expected to <b>apply</b> the math they previously learned as they progress through the year and to the next level.</li> <li>• Math content builds on previous lessons and years, but students learn in different ways and take different paths to learn concepts. Provide them with many opportunities every day to tackle and master math content in their world.</li> <li>• The workshop model for Reading and Writing is applicable to Mathematics as well. Use your knowledge of creating mini-lessons, allowing for independent and collaborative work time (problem solving), small group instruction, conferring, etc. to guide your math instruction.</li> <li>• All students are mathematicians. Find ways to allow our students to make true connections with math content.</li> <li>• Math instruction should incorporate reading and writing daily.</li> <li>• <u>Fluency Expectation:</u> <ul style="list-style-type: none"> <li>○ Fluently add and subtract multi-digit whole numbers.</li> <li>○ Fluently multiply within 100.</li> </ul> </li> </ul>		<p style="text-align: center;"><u>Process Standards for Mathematics</u></p> <p>As you work with your students, please remember the following:</p> <ul style="list-style-type: none"> <li>• The Process Standards for Mathematics are the “how” when delivering mathematics instruction. They rely on students communicating with each other about mathematics in order to learn mathematics.</li> <li>• The Process Standards for Mathematics are expected student behaviors.                             <ol style="list-style-type: none"> <li>1. <b>Make sense of problems and persevere in solving them.</b></li> <li>2. <b>Reason abstractly and quantitatively.</b></li> <li>3. <b>Construct viable arguments and critique the reasoning of others.</b></li> <li>4. <b>Model with mathematics.</b></li> <li>5. <b>Use appropriate tools strategically.</b></li> <li>6. <b>Attend to precision.</b></li> <li>7. <b>Look for and make use of structure.</b></li> <li>8. <b>Look for and express regularity in repeated reasoning.</b></li> </ol> </li> </ul>			
Each Component Includes:					
Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
These goals define the necessary habits, skills, and dispositions we want students to know and be able to do when the unit is completed.	The Indiana Academic Standards listed represent the priority standard for the unit. Other standards may be taught explicitly or implicitly.	The strategy and skill focus gives guidance for mini-lesson topics and ideas. It also gives ideas for teaching strategies you might rely upon for instruction. The goal is for students to gain understanding of these skills/strategies by the end of the unit.	Academic vocabulary includes the words that are needed to understand the content. You will also teach other vocabulary throughout the rest of your day. Assessment vocabulary should be integrated throughout the year. They should be explicitly taught and used regularly.	Professional and mentor text ideas are suggested in this section. Additionally, this is where you will find your connection to the Go Math resources. Ask your school librarian and/or instructional coach for assistance in this area also!	Ideas for scaffolding support for striving mathematicians, English learners and special education is provided. Please use your available resources to differentiate for students. Ask your building resource teachers for assistance if needed.
Testing Vocabulary to be Taught Throughout the Year					
<p><b>Best:</b> “Which statement <b>BEST</b> describes the two shapes?” Although more than one option might make sense, students will need to choose one that is better than all the others.</p> <p><b>Choose:</b> “<b>Choose</b> TWO fractions that are greater than 0.50.” Students will be asked to choose one or more items that fit the criteria.</p> <p><b>Complete:</b> “<b>Complete</b> the table by filling in the missing numbers.” Students may be asked to complete tables, graphs, and/or statements.</p> <p><b>Define the Variable:</b> Students should be able to provide a precise description of a variable used in an equation.</p> <p><b>Enter:</b> “<b>Enter</b> the product. <math>214 \times 12</math>”. Students will be asked to enter items. This means they type the answer in the appropriate place.</p> <p><b>Greatest:</b> “What is the <b>GREATEST</b> number of hats Sarah can buy?”</p> <p><b>Identify:</b> “<b>Identify</b> all errors in Jenna’s work.” Students will need to choose one or more items that fit the criteria.</p> <p><b>In ALL:</b> “How much money does Amy spend <b>IN ALL</b>?” Students will need to give a total. This does not mean to simply apply an operation, though. Students will need to read critically to determine the operation(s) that make(s) sense.</p> <p><b>More/Fewer:</b> “How many <b>MORE</b> stickers does Jimmy need to complete his collection?” Students will need to compare two quantities and determine how much more or less one quantity is than another.</p> <p><b>Plot:</b> “<b>Plot</b> an X on the line plot to represent Eric’s data.” Students will need to place data points on a coordinate grid, data display, or number line.</p> <p><b>Represent:</b> “<b>Represent</b> 0.20 as a fraction.” Students will need to be able to translate between different forms of the same concept (i.e. fractions and decimals, equivalent fractions, equivalent expressions).</p> <p><b>Select:</b> “<b>Select</b> the shape(s) that match the given attributes.” Students will need to choose one or more items that fit the criteria.</p> <p><b>Shade:</b> “<b>Shade</b> squares in the grid that represents the given fraction.” Students will need to fill in the appropriate amount</p> <p><b>Show All Work:</b> Students will need to show all work needed to solve problems in order to receive full credit.</p> <p><b>Solve/Evaluate:</b> “<b>Solve.</b> <math>145 + 82</math>” or “<b>Evaluate.</b> <math>145 + 82</math>” Students will need to give an answer for the test item.</p> <p><b>Use Word, Numbers and/or Symbols:</b> “<b>Use words, numbers, and/or symbols to support your answer.</b>” Students will need to explain their ideas clearly using math words, numbers or symbols. It should include evidence from the problem and student work.</p>					

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 1 Weeks 1 – 5	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<p><b>Unit 1: Intro to Your Math Block/Place Value and Addition and Subtraction with Whole Numbers</b></p>	<ul style="list-style-type: none"> <li>Mathematicians read and write whole numbers up to 1,000,000</li> <li>Mathematicians round whole numbers up to 1,000,000 to the nearest ten, hundred, thousand, ten thousand, and hundred thousand.</li> <li>Mathematicians order and compare whole numbers using symbols for less than, equal to, and greater than.</li> <li>Mathematicians use multi-digit numbers when solving real-world problems.</li> <li>Mathematicians understand and use standard algorithms and other strategies when solving problems involving addition and subtraction.</li> <li>Mathematicians use strategies for estimation to determine reasonableness of solutions to real-world problems.</li> </ul> <p><b>*text does not introduce the number 1,000,000, be sure to discuss this with students.</b></p> <p><b>**Text does not encourage students to write and solve addition and subtraction equations. This is a critical standard, so be sure to introduce these and work with your students</b></p>	<p>4.NS.1 4.NS.2 4.NS.9 4.C.1 4.AT.1</p>	<ul style="list-style-type: none"> <li>Introduce procedures and routines.</li> <li>Reinforce there are multiple ways to find solutions to problems.</li> <li>Read and write whole numbers up to 1,000,000 using models, standard form and expanded form.</li> <li>Compare and order whole numbers up to 1,000,000 using relational symbols.</li> <li>Round whole numbers to any given place value within 1,000,000.</li> <li>Understand and use 10s, 100s, 1,000s, 10,000s, 100,000s and 1,000,000s place value.</li> <li>Add and subtract whole numbers within 1,000,000 using multiple strategies.</li> <li>Understand and use the relationship between addition and subtraction when solving real-world problems.</li> <li>Make ten, one hundred, one thousand, ten thousand, one hundred thousand or one million with two or more whole numbers.</li> <li>Create equivalent, but easier known sums.</li> <li>Estimate sums/differences to check for reasonableness.</li> <li>Write and solve addition and subtraction equations with unknowns in all positions.</li> </ul>	<p>addend associative property commutative property difference equation equal to estimate expanded form explain greater than has the same value as hundreds inverse operations less than mathematicians one million ones period place value reasoning round standard form strategies sum ten thousands tens thousands word form variable</p>	<p><b>“First 20 Days”</b> resources/examples/ideas on P: Drive</p> <p><b>Weeks of Inspirational Math</b> <a href="https://www.youcubed.org/week-inspirational-math/">https://www.youcubed.org/week-inspirational-math/</a></p> <p><b>Go Math:</b> Chapter 1</p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> Ordering 4-digit numbers (4.NS.2) Rounding to the Nearest 100 and 1000 (4.NS.9) Rounding on the Number Line (4.NS.9) Rounding to the Nearest 1000 (4.NS.9) Carnival Tickets (4.AT.1) Karl’s Garden (4.AT.1)</p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Mentor Text(s)</b> <i>The Action of Subtraction</i> by Brian Cleary and Brian Gable <i>Shark Swimathon</i> by Stuart Murphy and Lynne Cravath <i>365 Penguins</i> by Jean-Luc Fromental <i>Math for All Seasons</i> <i>Mind-Stretching Math Riddles</i> by Greg Tang</p> <p><b>Math Reads: Making Math the Story Mastering the Basic Math Facts in Addition and Subtraction</b> <a href="https://www.heinemann.com/shared/onlineresources/e02963/oconelladd.pdf">https://www.heinemann.com/shared/onlineresources/e02963/oconelladd.pdf</a></p>	<p><b>Spiral Review:</b> 3.C.1, 3.AT.1</p> <p><b>Prerequisite Skills:</b></p> <ul style="list-style-type: none"> <li>Decompose and rename numbers in multiple ways</li> <li>Basic place value understanding</li> <li>Add and subtract 2-digit numbers using multiple strategies</li> </ul> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Encourage multiple ways to solve problems</li> <li>Provide models of finished products</li> <li>Provide picture support</li> <li>Ask all students to show their strategies while explaining</li> <li>Send home games to practice specific skills</li> </ul>
<p><b>Process Standards for Mathematics:</b></p>	<ul style="list-style-type: none"> <li>Mathematicians progress from concrete to pictorial to more abstract reasoning.</li> <li>Mathematicians explain the meaning of the symbols they choose.</li> <li>Mathematicians strategically choose tools to solve problems.</li> <li>Mathematicians look closely to discern a pattern or structure for the base-ten number system.</li> </ul>	<p>PS. 2 PS. 5 PS. 7</p>	<ul style="list-style-type: none"> <li>Compose and decompose numbers using equations and expressions.</li> <li>Make connections and find patterns between different forms of numbers (standard form, expanded form, word form, decomposed, etc.).</li> <li>Use number lines, fact families, place value charts and other tools to make sense of the structure of the number system. Explain how the tool helped to make connections.</li> </ul>			
<p>4.NS.1: Read and write whole numbers up to 1,000,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000,000</p> <p>4.NS.2: Compare two whole numbers up to 1,000,000 using &gt;, =, and &lt; symbols.</p> <p>4.NS.9: Use place value understanding to round multi-digit whole numbers to any given place value.</p> <p>4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.</p> <p>4.AT.1: Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 1 Weeks 6 – 9	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<p><b>Unit 2:</b></p> <p><b>Algebra: Understanding and Applying Multiplication</b></p>	<ul style="list-style-type: none"> <li>Mathematicians understand the meaning of multiplication.</li> <li>Mathematicians fluently multiply within 100.</li> <li>Mathematicians use and explain multiple strategies (based on place value and properties of operations) to multiply.</li> <li>Mathematicians understand the special properties of 0 and 1 in multiplication.</li> <li>Mathematicians know and use strategies for estimating results of any whole number computation.</li> <li>Mathematicians describe and use relationships between two variables to solve problems.</li> </ul> <p><b>**Standard algorithm for multiplication is not a requirement until 5<sup>th</sup> grade**</b></p>	<p>4.NS.8 4.C.2 4.C.4 4.C.7 4.AT.2 4.AT.3 4.AT.4 4.AT.6</p>	<ul style="list-style-type: none"> <li>Multiply four-digit by one-digit numbers using multiple strategies.</li> <li>Multiply 2 two-digit numbers using multiple strategies.</li> <li>Use commutative and associative properties for multiplication.</li> <li>Understand the relationships between addition and multiplication.</li> <li>Write and solve real-world multiplication and division equations.</li> <li>Understand and explain multiplicative and additive comparisons.</li> <li>Apply the relationship between subtraction and division.</li> <li>Apply the inverse relationship between multiplication and division</li> <li>Estimate products and quotients.</li> <li>Find whole number quotients and remainders with up to four digit dividends and one digit divisors. Explain the meaning of remainders.</li> <li>Find all factor pairs for whole numbers in the range 1 – 100.</li> <li>Determine if a whole number is a multiple of a given number.</li> <li>Generate number patterns that follow a given rule.</li> <li>Multiply within 100 fluently.</li> <li>Use simple equations to generate number patterns.</li> </ul>	<p>algorithm array associative property common factor common multiple commutative property compatible numbers distributive property equation estimate expanded form factor interpret inverse operation method multiple multiply partial product pattern place value product regroup related facts round rule structure variable</p>	<p><b>Go Math:</b> Chapters 2 &amp; 3 Additional IN lessons: 1.8a, 1.8b, 1.8c, 1.8d, 1.8e, 1.8f, 1.8g, 5.6a <b>Skip lesson 2.10, 2.11</b></p> <p><b>Illustrative Mathematics Tasks:</b> (<a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a>) The Locker Game (4.NS.8) Thousands and Millions of Fourth Graders (4.C.2) Threatened and Endangered (4.AT.3) Comparing Money Raised (4.AT.4)</p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> Bikes and Trikes (4.AT.4/PS.2, PS.4) Buttons (4.AT.6/PS.3, PS.7) Number Trains (4.NS.8/PS.7, PS.8) Piles of Oranges <a href="http://www.insidemathematics.org/performance-assessment-tasks">http://www.insidemathematics.org/performance-assessment-tasks</a></p> <p><b>Mentor Text</b> <i>The Best of Times</i> by Greg Tang <i>One Grain of Rice</i> by Demi <i>The Doorbell Rang</i> by Pat Hutchins</p>	<p><b>Spiral Review:</b> 4.NS.1, 4.NS.2</p> <p><b>Prerequisite Skills:</b></p> <ul style="list-style-type: none"> <li>Use arrays to write multiplication sentences</li> <li>Multiply multi-digit whole numbers by one digit whole numbers</li> <li>Rename numbers</li> <li>Use visual models to divide</li> <li>Find multiples of whole numbers</li> <li>Add and subtract multi-digit whole numbers</li> <li>Skip count</li> </ul> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Manipulatives</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Provide picture support</li> <li>Ask all students to show their strategies while explaining</li> <li>Send home games to practice specific skills</li> </ul>
<p><b>Process Standards for Mathematics:</b></p>	<ul style="list-style-type: none"> <li>Mathematicians make sense of problems and persevere in solving them.</li> <li>Mathematicians use estimation to decide if answers are reasonable.</li> <li>Mathematicians look for patterns to uncover the relationship between multiplication and division.</li> </ul>	<p>PS.1 PS.3 PS.7</p>	<ul style="list-style-type: none"> <li>Provide contextual problems and time to solve real problems that involve the four operations with whole numbers.</li> <li>Explore multiple strategies for multiplication and division to help make sense of different strategies and contexts.</li> <li>Use number lines, fact families, place value charts and other tools to make sense of the structure of the number system.</li> <li>Write and evaluate algebraic and numerical expressions and equations for contextual problems, relating the solution(s) back to the original context.</li> </ul>			
<p>4.NS.8: Find all factor pairs 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 in the range 1–100 is a multiple of a given one-digit number.</p> <p>4.C.2: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.</p> <p>4.C.4: Multiply fluently within 100.</p> <p>4.C.7: Show how the order in which two numbers are multiplied (commutative property) and how numbers are grouped in multiplication (associative property) will not change the product. Use these properties to show that numbers can be multiplied in any order. Understand and use the distributive property.</p> <p>4.AT.2: Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.</p> <p>4.AT.3: Interpret a multiplication equation as a comparison (e.g., interpret <math>35 = 5 \times 7</math> as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <p>4.AT.4: Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]</p> <p>4.AT.6: Describe a relationship between two variables and use to find a second number when a first number is given. Generate a number pattern that follows a given rule.</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 2 Weeks 10 – 15	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<p><b>Unit 3:</b></p> <p><b>Algebra: Understanding and Applying Division</b></p>	<ul style="list-style-type: none"> <li>Mathematicians understand the meaning of division.</li> <li>Mathematicians use and explain multiple strategies (based on place value and properties of operations) to divide.</li> <li>Mathematicians understand the special properties of 0 and 1 in division.</li> <li>Mathematicians know and use strategies for estimating results of any whole number computation.</li> <li>Mathematicians create and use equations to solve problems.</li> </ul> <p><b>**Standard algorithm for division is not a requirement until 6<sup>th</sup> grade**</b></p>	4.NS.8 4.C.2 4.C.3 4.C.4 4.AT.2 4.AT.3 4.AT.4 4.AT.6	<ul style="list-style-type: none"> <li>Write and solve real-world multiplication and division equations.</li> <li>Apply the relationship between subtraction and division.</li> <li>Apply the inverse relationship between multiplication and division</li> <li>Estimate products and quotients.</li> <li>Find whole number quotients and remainders with up to four digit dividends and one digit divisors. Explain the meaning of remainders.</li> <li>Find all factor pairs for whole numbers in the range 1 – 100.</li> <li>Determine if a whole number is a multiple of a given number.</li> <li>Generate number patterns that follow a given rule.</li> <li>Understand that equations can be rules to describe relationships between two variables.</li> <li>Multiply within 100 fluently.</li> <li>Use simple equations to generate number patterns.</li> <li>Understand factors of whole numbers from 1 – 100.</li> </ul>	algorithm common factor common multiple commutative property compatible numbers divide dividend divisible division divisor equation estimate expanded form factor inverse operation method multiple partial quotient pattern place value quotient regroup related facts remainder round rule structure variable	<p><b>Go Math!</b> Chapters 4 &amp; 5</p> <p><b>Skip lessons: 4.4, 4.9, 4.10, 4.11, 5.5</b></p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> The Locker Game (4.NS.8) Thousands and Millions of Fourth Graders (4.C.2) Mental Division Strategy (4.C.3) Threatened and Endangered (4.AT.3) Comparing Money Raised (4.AT.4)</p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> Bikes and Trikes (4.AT.4/PS.2, PS.4) Buttons (4.AT.6/PS.3, PS.7) Number Trains (4.NS.8/PS.7, PS.8) Piles of Oranges <a href="http://www.insidemathematics.org/performance-assessment-tasks">http://www.insidemathematics.org/performance-assessment-tasks</a></p> <p><b>Mentor Text</b> <i>One Grain of Rice</i> by Demi <i>The Great Divide</i> by Suzanne Slade <i>The Doorbell Rang</i> by Pat Hutchins</p>	<p><b>Spiral Review:</b> 4.C.1, 4.C.4, 4.M.4*, 4.AT.5*</p> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Concrete models</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Picture Support</li> <li>Ask all students to show their strategies while explaining</li> <li>Games to practice specific skills at home</li> </ul>
<p><b>Process Standards for Mathematics:</b></p>	<ul style="list-style-type: none"> <li>Mathematicians make sense of problems and persevere in solving them.</li> <li>Mathematicians use estimation to decide if answers are reasonable.</li> <li>Mathematicians look for patterns to uncover the relationship between multiplication and division.</li> </ul>	PS. 1 PS. 3 PS. 7	<ul style="list-style-type: none"> <li>Provide contextual problems and time to solve real problems that involve the four operations with whole numbers.</li> <li>Explore multiple strategies for multiplication and division to help make sense of different strategies and contexts.</li> <li>Use number lines, fact families, place value charts and other tools to make sense of the structure of the number system.</li> <li>Write and evaluate algebraic and numerical expressions and equations for contextual problems, relating the solution(s) back to the original context</li> </ul>			
<p>4.NS.8: Find all factor pairs 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 in the range 1–100 is a multiple of a given one-digit number.</p> <p>4.C.2: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.</p> <p>4.C.3: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.</p> <p>4.C.4: Multiply fluently within 100.</p> <p>4.AT.2: Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.</p> <p>4.AT.3: Interpret a multiplication equation as a comparison (e.g., interpret <math>35 = 5 \times 7</math> as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <p>4.AT.4: Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]</p> <p>4.AT.6: Describe a relationship between two variables and use to find a second number when a first number is given. Generate a number pattern that follows a given rule.</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 2 Weeks 16 – 18	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<b>Unit 4:</b>  <b>Data Analysis</b>	<ul style="list-style-type: none"> <li>Mathematicians interpret data graphs to answer questions about situations.</li> <li>Mathematicians summarize and display the results of experiments in a clear and organized way.</li> <li>Mathematicians use fractions in multiple situations.</li> <li>Mathematicians record observations in multiple ways.</li> </ul>	4.DA.1 4.DA.2 4.DA.3 4.AT.5	<ul style="list-style-type: none"> <li>Formulate questions that can be addressed with data (<b>STEM focus</b>).</li> <li>Use observations, surveys, and experiments to collect, represent and interpret data.</li> <li>Collect, display, and interpret data about lengths, volumes, masses, money amounts, intervals of time, and distances using tables (i.e. frequency tables), line plots, and bar graphs.</li> <li>Use tables, line plots and bar graphs to represent and interpret data.</li> <li>Make a line plot to display a data set of measurements in fractions of a unit (halves, fourths and eighths).</li> <li>Solve problems involving addition and subtraction of fractions (using the line plots, using measurement data, etc.)</li> <li>Interpret data displayed in a circle graph.</li> <li>Use addition and subtraction problems involving simple fractions to solve measurement problems, including writing equations to represent the problem.</li> <li>Add and subtract fractions with common denominators.</li> </ul>	bar graph circle graph data denominator display experiment explain interpret line plot model numerator precision reasonable stem strategies viable argument	<p><b>Go Math!</b> Chapter 12: Lesson 12.5 IN Lessons: 12.4a, 12.4b, 12.5a</p> <p>Additional IN lessons: 12.1a (<b>extend this lesson to include displays with line plots, and interpreting displays</b>),</p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> Button Diameters (4.DA.1)</p> <p><b>Everyday Mathematics Teacher's Guide to Games</b></p> <p><b>Making Sense: Teaching and Learning Mathematics with Understanding</b></p> <p><b>Good Questions for Math Teaching (K-6)</b> Data pg. 98 – 100</p> <p><b>Mentor Text</b> <i>Gray Rabbit's odd one out</i> <i>Data, Chance and Probability</i> by: Graham A. Jones</p>	<p><b>Spiral Review:</b> 4.C.1, 4.C.4, 4.M.4*, 4.AT.5*</p> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Concrete models</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Picture Support</li> <li>Ask all students to show their strategies while explaining</li> <li>Games to practice specific skills at home</li> </ul>
<b>Process Standards for Mathematics:</b>	<ul style="list-style-type: none"> <li>Mathematicians make sense of problems and persevere in solving them.</li> <li>Mathematicians use estimation to decide if answers are reasonable.</li> <li>Mathematicians keep working when the problems seem difficult, trying multiple strategies.</li> <li>Mathematicians model real-world situations using mathematics.</li> <li>Mathematicians calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context.</li> </ul>	PS. 1 PS. 2 PS. 4 PS. 6	<ul style="list-style-type: none"> <li>Use visual models, drawings, and strategies based on place value for computation with fractions and decimals.</li> <li>Write and evaluate equations or expressions for a problem situation. Explain the solution, relating it back to the context of the problem.</li> <li>Use estimation to check reasonableness of a solution.</li> <li>Calculate accurately when using fractions.</li> <li>Represent and explain real-world situations using data, graphs, expressions, etc.</li> </ul>			
4.DA.1: Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs. 4.DA.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots. 4.DA.3: Interpret data displayed in a circle graph. 4.AT.5: Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 3 Weeks 19 – 23	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<p><b>Unit 5:</b></p> <p><b>Understanding and Applying Fractions and Decimals</b></p>	<ul style="list-style-type: none"> <li>Mathematicians use decimal and fraction notation.</li> <li>Mathematicians add and subtract simple fractions.</li> <li>Mathematicians extend their understandings of rounding to decimal place values.</li> <li>Mathematicians determine the amount of change from a purchase.</li> <li>Mathematicians compare decimals and fractions with different denominators.</li> </ul> <p><b>In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, and 100.</b></p>	<p>4.NS.3 4.NS.4 4.NS.5 4.NS.6 4.NS.7 4.AT.5 4.C.5 4.C.6 4.M.3</p>	<ul style="list-style-type: none"> <li>Express whole numbers as fractions.</li> <li>Name and write mixed numbers using objects or pictures.</li> <li>Name and write mixed numbers as improper fractions using objects/pictures.</li> <li>Generate equivalent fractions. Reason about the size of the pieces and how they are still equivalent.</li> <li>Compare two fractions with different numerators and different denominators (create common denominators, compare to a benchmark fraction, etc.) using relational symbols.</li> <li>Write halve, fourths, tenths and hundredths in decimal and fraction notation.</li> <li>Compare decimals to hundredths using relational symbols.</li> <li>Add and subtract fractions and mixed numbers with common denominators.</li> <li>Use all four operations to solve problems involving money (decimals).</li> <li>Understand and compare fractions, whole numbers, mixed numbers, and improper fractions.</li> <li>Understand the relationship between decimals and fractions.</li> <li>Solve real-world problems involving the addition and subtraction of fractions and mixed numbers with common denominators (including writing and evaluating equations and expressions, using variables, to understand that problem).</li> </ul>	<p>associative property benchmark common denominator common multiple commutative property compare decimal decimal point denominator equation equivalent equivalent fractions factor fourth fraction greater than half has the same value as hundredth improper fraction less than mixed number multiple notation numerator place value simplest form tenth unit fraction whole whole number</p>	<p><b>Go Math:</b> Chapters 6, 7, 9 Additional IN lessons: 5.6b, 5.6c, 6.6a, 9.2a <b>Skip – Chapter 8</b></p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> Fractions and Rectangles (4.NS.4) Comparing Fractions Using Benchmarks Game (4.NS.5) Dimes and Pennies (4.NS.6) How Many Tenths and Hundredths (4.NS.6) Using Place Value (4.NS.7) Cynthia's Perfect Punch (4.C.6) Peaches (4.C.6) Plastic Building Blocks (4.C.6)</p> <p><b>Learning Math: Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> Picking Fractions (4.NS.1/PS.2, PS.5) <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/picking%20fractions.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/picking%20fractions.pdf</a></p> <p><b>Good Questions for Math Teaching</b> Fractions pg. 26 – 27 Decimals pg. 29 – 30</p> <p><b>Mentor Text</b> <i>Piece=Part= Portion: Fractions=Decimals= Percents</i> by Scott Gifford <i>Fraction Fun</i> by David Adler and Nancy Tobin</p>	<p><b>Spiral Review:</b> 4.C.1, 4.AT.1</p> <p><b>Prerequisite Skills:</b></p> <ul style="list-style-type: none"> <li>Understand basic concepts of fractions</li> <li>Familiarity with place value</li> <li>Familiarity with coin values</li> </ul> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Encourage multiple ways to solve problems</li> <li>Provide models of finished products</li> <li>Provide picture support</li> <li>Ask all students to show their strategies while explaining</li> <li>Send home games to practice specific skills</li> </ul>
<p><b>Process Standards for Mathematics:</b></p>	<ul style="list-style-type: none"> <li>Mathematicians use math to solve real-world problems.</li> <li>Mathematicians break problems into smaller parts in order to solve them.</li> <li>Mathematicians choose appropriate tools, and can explain why they chose the tool, to solve problems.</li> <li>Mathematicians look for patterns, make generalizations, and apply similar reasoning to other problems.</li> </ul>	<p>PS.1 PS.2 PS.5 PS.8</p>	<ul style="list-style-type: none"> <li>Provide contextual problems and time to tackle real-world problems that involve fractions and decimals.</li> <li>Write and evaluate algebraic and numerical expressions and equations for contextual problems, relating the solution(s) back to the original context.</li> <li>Use tools such as base-ten blocks, number lines, visual models, etc. to solve problems with fractions and decimals, including money.</li> <li>Relate strategies for adding and subtracting whole numbers to adding and subtracting fractions and decimals.</li> </ul>			
<p>4.NS.3: Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.</p> <p>4.NS.4: Explain why a fraction, <math>a/b</math>, is equivalent to a fraction, <math>(n \times a)/(n \times b)</math>, by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]</p> <p>4.NS.5: Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as 0, <math>1/2</math>, and 1). Recognize comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions (e.g., by using a visual fraction model).</p> <p>4.NS.6: Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., <math>1/2 = 0.5 = 0.50</math>, <math>7/4 = 1\ 3/4 = 1.75</math>).</p> <p>4.NS.7: Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>, and justify the conclusions (e.g., by using a visual model).</p> <p>4.AT.5: Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).</p> <p>4.C.5: Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.</p> <p>4.C.6: Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).</p> <p>4.M.3: Use the four operations to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit.</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 3 Weeks 24 – 27	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<p><b>Unit 6:</b></p> <p><b>Measurement</b></p>	<ul style="list-style-type: none"> <li>Mathematicians measure length using appropriate tools and precision.</li> <li>Mathematicians understand how units of measure are related.</li> <li>Mathematicians solve problems using measurement and the four basic operations, including instances with fractions.</li> <li>Mathematicians know and use formulas for finding the perimeter and area of rectangles.</li> <li>Mathematicians estimate and calculate the area of rectangular shapes by using appropriate units, such as square centimeter and square inch.</li> <li>Mathematicians understand that rectangles with the same area can have different perimeters and that rectangles with the same perimeter can have different areas.</li> <li>Mathematicians find areas of complex shapes by dividing them into rectangles.</li> </ul> <p><b>**Measurement units: km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec; yd, ft, in</b></p>	<p>4.C.1 4.C.4 4.C.5 4.M.1 4.M.2 4.M.3 4.M.4 4.AT.5</p>	<ul style="list-style-type: none"> <li>Collect, display, and interpret data about lengths, volumes, masses, money amounts, intervals of time, and distances using tables (i.e. frequency tables), line plots, and bar graphs.</li> <li>Make a line plot to display a data set of measurements in fractions of a unit (halves, fourths and eighths).</li> <li>Measure length to the nearest eighth-inch and millimeter.</li> <li>Know relative sizes of measurement units within one system of units</li> <li>Express measurements in a larger unit in terms of a smaller unit within a single system of measurement.</li> <li>Record measurement equivalents in a two-column table.</li> <li>Use the four operations to solve problems involving distances, intervals of time, volumes, and masses of object.</li> <li>Use addition and subtraction problems involving simple fractions to solve measurement problems, including writing and solving equations.</li> <li>Develop and apply area and perimeter formulas for rectangles and complex shapes made up of rectangles.</li> <li>Recognize area as additive. Use this to find the area of complex shapes.</li> <li>Measure length to the nearest eighth-inch and millimeter.</li> <li>Understand the relative sizes of measures within a system.</li> <li>Solve measurement problems using the four operations.</li> <li>Solve problems involving the area and perimeter of rectangles and complex shapes (made up of non-overlapping rectangles).</li> <li>Solve addition and subtraction of fraction problems with data from line plots.</li> </ul>	<p>area base centimeter complex shape cup decimeter elapsed time fluid ounce foot formula gallon gram half gallon height hour inch kilogram length linear units liter mass meter mile milliliter millimeter minute ounce perimeter pint pound quart second square unit time unit weight width yard</p>	<p><b>Go Math:</b> Chapters 12 &amp; 13 Additional IN lessons: 12.1a (<b>extend this lesson to include displays with line plots, and interpreting displays</b>)</p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> Comparing Sums of Unit Fractions (4.C.5) Who is the Tallest? (4.M.2) Margie Buys Apples (4.M.3)</p> <p><b>Learning Math: Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> Fair Play (4.M.4/PS.6, PS.7) <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/fair%20play.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/fair%20play.pdf</a></p> <p><b>Good Questions for Math Teaching</b> Area pg. 58 – 60 Length and Perimeter pg. 68 – 69 Weight pg. 49 – 50 Volume and Capacity pg. 53 – 54</p> <p><b>Mentor Text</b> <i>Sir Cumference and the Isle of Immeter</i> by Cindy Neuschwander <i>Actual Size</i> <i>Millions to Measure</i> <i>A Tiger or the World's Largest Spider</i></p>	<p><b>Spiral Review:</b> 4.C.2, 4.C.3, 4.C.4</p> <p><b>Prerequisite Skills:</b></p> <ul style="list-style-type: none"> <li>Add and multiply whole numbers and fractions.</li> <li>Tell time to the nearest half-hour.</li> <li>Find missing factors in multiplication problems.</li> <li>Represent multiplication with visual models.</li> </ul> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Concrete models</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Provide picture support</li> <li>Ask all students to show their strategies while explaining</li> <li>Send home games to practice specific skills</li> </ul>
<p><b>Process Standards for Mathematics:</b></p>	<ul style="list-style-type: none"> <li>Mathematicians use appropriate tools strategically to understand the relationships between different units within a measurement system.</li> <li>Mathematicians use precision when measuring and discussing attributes of objects.</li> <li>Mathematicians calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context.</li> </ul>	<p>PS. 5 PS. 6</p>	<ul style="list-style-type: none"> <li>Use a variety of tools to make connections between different units within a measurement system.</li> <li>Use precise vocabulary and units when discussing mathematics.</li> <li>Use estimation to check solutions to real-world problems.</li> <li>Show work to ensure precision in calculations.</li> </ul>			
<p>4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach. 4.C.4: Multiply fluently within 100. 4.C.5: Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole. 4.M.1: Measure length to the nearest quarter-inch, eighth-inch, and millimeter. 4.M.2: Know relative sizes of measurement units within a system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two column table. 4.M.3: Use the four operations to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit. 4.M.4: Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems. 4.AT.5: Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 4 Weeks 28 – 32	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Possible Instructional Resources	Differentiation
<b>Unit 7: Geometry</b>	<ul style="list-style-type: none"> <li>Mathematicians identify, classify, describe, and draw geometric figures using appropriate tools.</li> <li>Mathematicians identify line-symmetric figures, describe their properties, and draw lines of symmetry.</li> <li>Mathematicians make connections between circles and angle measures.</li> </ul>	4.G.1 4.G.2 4.G.3 4.G.4 4.G.5 4.M.5 4.M.6	<ul style="list-style-type: none"> <li>Identify, describe and draw parallelograms, rhombuses and trapezoids.</li> <li>Recognize and draw lines of symmetry in 2D figures.</li> <li>Identify figures that have lines of symmetry.</li> <li>Identify, describe, and draw line segments, rays, angles (acute, right, and obtuse), perpendicular and parallel lines.</li> <li>Classify triangles and quadrilaterals based on angles and the presence or absence of parallel or perpendicular lines.</li> <li>Understand how angles are measured and how they are related to circles.</li> <li>Measure and sketch angles using appropriate tools.</li> <li>Classify triangles based on attributes.</li> </ul>	acute acute angle acute triangle angle attributes circle clockwise counterclockwise degree intersecting line line of symmetry line segment obtuse obtuse angle obtuse triangle parallel parallel lines parallelogram perpendicular lines plane point polygon protractor quadrilateral ray rectangle rhombus right right angle right triangle side square straight straight angle trapezoid triangle vertex	<p><b>Go Math:</b> Chapters 10 &amp; 11 Additional IN lessons: 10.4a</p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">www.illustrativemathematics.org</a> Finding Lines of Symmetry (4.G.2) Lines of Symmetry for Circles (4.G.2) Lines of Symmetry for Quadrilaterals Lines of Symmetry for Triangles (4.G.2) Are These Right? (4.G.5) Defining Attributes of Rectangles and Parallelograms (4.G.5) What is a Trapezoid? (4.G.5) What Shape am I? (4.G.5) Finding an Unknown Angle (4.G.5) Measuring Angles (4.M.6)</p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> Quilt Making (4.G.5/PS.6, PS.8) Symmetrical Pattern (4.G.2/PS.5, PS.6) <a href="http://www.insidemathematics.org/performance-assessment-tasks">http://www.insidemathematics.org/performance-assessment-tasks</a></p> <p><b>Good Questions for Math Teaching (K-6)</b> 2-dimensional Shapes pg. 79 – 81 3-dimensional Shapes pg. 85 – 88</p> <p><b>Mentor Text</b> <i>What's your angle Pythagoras?</i> <i>War lords puzzle</i> <i>Captain Invincible and the Space Shapes</i></p>	<p><b>Spiral Review:</b> 4.AT.5, 4.C.5, 4.C.6</p> <p><b>Prerequisite Skills:</b></p> <ul style="list-style-type: none"> <li>Identify number of sides and vertices on 2-dimensional shapes.</li> <li>Identify, create, and extend geometric patterns.</li> <li>Use a metric ruler accurately.</li> <li>Classify angles based on angle measure.</li> <li>Understand fractions as part of a whole.</li> </ul> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Concrete models</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Provide picture support</li> <li>Ask all students to show their strategies while explaining</li> <li>Send home games to practice specific skills</li> </ul>
<b>Process Standards for Mathematics:</b>	<ul style="list-style-type: none"> <li>Mathematicians construct viable arguments and critique the reasoning of others.</li> <li>Mathematicians use appropriate tools strategically.</li> <li>Mathematicians use clear definitions when discussing and reasoning about geometric figures.</li> </ul>	PS. 1 PS. 3 PS. 6	<ul style="list-style-type: none"> <li>Choose multiples strategies, manipulatives, and concrete models to solve problems. Explain why a tool was chosen.</li> <li>Use precise vocabulary to describe and classify geometric figures.</li> <li>Justify claims using mathematical arguments.</li> <li>Politely defend or reject others' claims, using mathematical arguments.</li> </ul>			
<p>4.G.1: Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).</p> <p>4.G.2: Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.</p> <p>4.G.3: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.</p> <p>4.G.4: Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge and technology). Identify these in two-dimensional figures.</p> <p>4.G.5: Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).</p> <p>4.M.5: Understand that an angle is measured with reference to a circle, with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. Understand an angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure other angles. Understand an angle that turns through "n" one-degree angles is said to have an angle measure of n degrees.</p> <p>4.M.6: Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.</p>						

**4<sup>th</sup> Grade Mathematics – Scope and Sequence – MSD of Pike Township**

Quarter 4 Week 33 - 36	Essential Goals	Priority Standards	Strategies/Skills	Academic Vocabulary	Instructional Resources	Differentiation
<p><b>Math Content:</b></p> <p><b>Unit 8:</b> <b>Reinforce and Extend Mathematical Understandings</b></p>	<ul style="list-style-type: none"> <li>Mathematicians practice critical grade level skills, in a variety of formats, to prepare them for more complex mathematical understandings.</li> <li>Mathematicians make sense of a variety of problems and persevere in solving them.</li> <li>Mathematicians reason abstractly and quantitatively to solve problems.</li> <li>Mathematicians construct viable arguments and critique the reasoning of others.</li> <li>Mathematicians apply math skills and understandings to solve real-world problems.</li> <li>Mathematicians use a variety of tools to aid them in solving mathematical and real-world problems.</li> <li>Mathematicians use structures and patterns to solve problems efficiently.</li> </ul>	4.C.1 4.C.2 4.C.3 4.C.4 4.C.5 4.C.6 4.AT.1 4.AT.5 4.M.4	<ul style="list-style-type: none"> <li>Use pre- and post-assessments to determine reinforcement or extension of skills and understandings.</li> <li>Use multiple representations to solve problems.</li> <li>Connect mathematics to students’ daily lives.</li> <li>Use correct mathematical vocabulary.</li> <li>Use accurate labels, symbols, and calculations.</li> <li>Work in teams to solve problems and justify solutions.</li> <li>Select an appropriate tool to solve a problem and explain why the tool makes sense to use.</li> <li>Explain whether or not a solution or process is reasonable for the problem situation.</li> </ul>	abstract reasoning argument construct critique efficient mathematical models persevere precision proficient quantitative reasoning reasonable reasoning repeated reasoning strategically structure	<p><b>Go Math:</b> Feel free to pull ideas from: IN Success Supplement – STEM Activities End of Year Review Projects Unit Projects Getting Ready for 5<sup>th</sup> grade</p> <p><b>Illustrative Mathematics Tasks:</b> <a href="http://www.illustrativemathematics.org">http://www.illustrativemathematics.org</a></p> <p><b>Learning Math in the Intermediate Grades (Madison MSD)</b> <a href="https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf">https://mathweb.madison.k12.wi.us/files/math/LMIGcomplete.pdf</a></p> <p><b>Inside Mathematics:</b> The Baker (4.C.2, 4.C.3/PS.1, PS.6)</p> <p><b>Making Sense: Teaching and Learning Mathematics with Understanding</b></p> <p><b>Good Questions for Math Teaching</b></p> <p><b>Mentor Text</b> <i>Mystery Math: A first book of algebra Math for all seasons</i> by Greg Tang <i>Math Fables: Lessons that count</i> by Greg Tang</p>	<p><b>*Spiral review: use critical standards from previous units</b></p> <p><b>Scaffolding Support (ELL; SPED; Striving Learners)</b></p> <ul style="list-style-type: none"> <li>Go Math: differentiation materials</li> <li>Open ended problems with multiple entry points</li> <li>Written instructions</li> <li>Small group instruction</li> <li>Graphic Organizers</li> <li>Manipulatives</li> <li>Concrete models</li> <li>Encourage multiple ways to solve problems</li> <li>Models of finished products</li> <li>Picture Support</li> <li>Ask all students to show their strategies while explaining</li> <li>Games to practice specific skills at home</li> </ul>
<p>4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.</p> <p>4.C.2: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.</p> <p>4.C.3: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.</p> <p>4.C.4: Multiply fluently within 100.</p> <p>4.C.5: Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.</p> <p>4.C.6: Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).</p> <p>4.AT.1: Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).</p> <p>4.AT.5: Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).</p> <p>4.M.4: Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems.</p>						

### Process Standards for Mathematics

The Process Standards demonstrate the ways in which students should develop conceptual understanding of mathematical content, and the ways in which students should synthesize and apply mathematical skills.	
<b>PS.1: Make sense of problems and persevere in solving them.</b>	Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” and “Is my answer reasonable?” They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
<b>PS.2: Reason abstractly and quantitatively.</b>	Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
<b>PS.3: Construct viable arguments and critique the reasoning of others.</b>	Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is true always, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.
<b>PS.4: Model with mathematics.</b>	Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
<b>PS.5: Use appropriate tools strategically.</b>	Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication and problem solving.
<b>PS.6: Attend to precision.</b>	Mathematically proficient students communicate precisely to others. They use clear definitions, including correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context.
<b>PS.7: Look for and make use of structure.</b>	Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects.
<b>PS.8: Look for and express regularity in repeated reasoning.</b>	Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula. Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results.

**NUMBER SENSE**

<b>4.NS.1</b>	Read and write whole numbers up to 1,000,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000,000.
<b>4.NS.2</b>	Compare two whole numbers up to 1,000,000 using $>$ , $=$ , and $<$ symbols.
<b>4.NS.3</b>	Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.
<b>4.NS.4</b>	Explain why a fraction, $a/b$ , is equivalent to a fraction, $(n \times a)/(n \times b)$ , by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]
<b>4.NS.5</b>	Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as 0, $1/2$ , and 1). Recognize comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual fraction model).
<b>4.NS.6</b>	Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., $1/2 = 0.5 = 0.50$ , $7/4 = 1\ 3/4 = 1.75$ ).
<b>4.NS.7</b>	Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual model).
<b>4.NS.8</b>	Find all factor pairs 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 in the range 1–100 is a multiple of a given one-digit number.
<b>4.NS.9</b>	Use place value understanding to round multi-digit whole numbers to any given place value.

**COMPUTATION**

<b>4.C.1</b>	Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.
<b>4.C.2</b>	Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.
<b>4.C.3</b>	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.
<b>4.C.4</b>	Multiply fluently within 100.
<b>4.C.5</b>	Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.
<b>4.C.6</b>	Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).
<b>4.C.7</b>	Show how the order in which two numbers are multiplied (commutative property) and how numbers are grouped in multiplication (associative property) will not change the product. Use these properties to show that numbers can be multiplied in any order. Understand and use the distributive property.

**ALGEBRAIC THINKING**

<b>4.AT.1</b>	Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).
<b>4.AT.2</b>	Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.
<b>4.AT.3</b>	Interpret a multiplication equation as a comparison (e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.

4<sup>th</sup> Grade Math Indiana Academic Standards (2020)

<b>4.AT.4</b>	Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]
<b>4.AT.5</b>	Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).
<b>4.AT.6</b>	Describe a relationship between two variables and use to find a second number when a first number is given. Generate a number pattern that follows a given rule.

**GEOMETRY**

<b>4.G.1</b>	Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).
<b>4.G.2</b>	Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.
<b>4.G.3</b>	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.
<b>4.G.4</b>	Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge and technology). Identify these in two-dimensional figures.
<b>4.G.5</b>	Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).

**MEASUREMENT**

<b>4.M.1</b>	Measure length to the nearest quarter-inch, eighth-inch, and millimeter.
--------------	--

4<sup>th</sup> Grade Math Indiana Academic Standards (2020)

<b>4.M.2</b>	Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.
<b>4.M.3</b>	Use the four operations to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit.
<b>4.M.4</b>	Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems.
<b>4.M.5</b>	Understand that an angle is measured with reference to a circle, with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. Understand an angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure other angles. Understand an angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees.
<b>4.M.6</b>	Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.

**DATA ANALYSIS**

<b>4.DA.1</b>	Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.
<b>4.DA.2</b>	Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{8}$ ). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.
<b>4.DA.3</b>	Interpret data displayed in a circle graph.

3 – 5 Math Standards Vertical Alignment (2014 Language)

Number Sense		
Third Grade	Fourth Grade	Fifth Grade
3.NS.1: Read and write whole numbers up to 10,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 10,000.	4.NS.1: Read and write whole numbers up to 1,000,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000,000.	5.NS.3: Recognize the relationship that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right, and inversely, a digit in one place represents 1/10 of what it represents in the place to its left.  5.NS.4: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
3.NS.2: Compare two whole numbers up to 10,000 using $>$ , $=$ , and $<$ symbols.	4.NS.2: Compare two whole numbers up to 1,000,000 using $>$ , $=$ , and $<$ symbols.	
3.NS.3: Understand a fraction, $1/b$ , as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction, $a/b$ , as the quantity formed by $a$ parts of size $1/b$ . [In grade 3, limit denominators of fractions to 2, 3, 4, 6, 8.]	4.NS.3: Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.	5.NS.2: Explain different interpretations of fractions, including: as parts of a whole, parts of a set, and division of whole numbers by whole numbers.
3.NS.4: Represent a fraction, $1/b$ , on a number line by defining the interval from 0 to 1 as the whole, and partitioning it into $b$ equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.		
3.NS.5: Represent a fraction, $a/b$ , on a number line by marking off lengths $1/b$ from 0. Recognize that the resulting interval has size $a/b$ , and that its endpoint locates the number $a/b$ on the number line.	4.NS.4: Explain why a fraction, $a/b$ , is equivalent to a fraction, $(n \times a)/(n \times b)$ , by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]	5.NS.1: Use a number line to compare and order fractions, mixed numbers, and decimals to thousandths. Write the results using $>$ , $=$ , and $<$ symbols.
3.NS.6: Understand two fractions as equivalent (equal) if they are the same size, based on the same whole or the same point on a number line.		
3.NS.7: Recognize and generate simple equivalent fractions (e.g., $1/2 = 2/4$ , $4/6 = 2/3$ ). Explain why the fractions are equivalent (e.g., by using a visual fraction model).	4.NS.5: Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as 0, $1/2$ , and 1). Recognize comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual fraction model).	
3.NS.8: Compare two fractions with the same numerator or the same denominator by reasoning about their size based on the same whole. Record the results of comparisons with the symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual fraction model).		
3.NS.9: Use place value understanding to round 2- and 3-digit whole numbers to the nearest 10 or 100.	4.NS.7: Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols $>$ , $=$ , or $<$ , and justify the conclusions (e.g., by using a visual model).	5.NS.5: Use place value understanding to round decimal numbers up to thousandths to any given place value.
	4.NS.9: Use place value understanding to round multi-digit whole numbers to any given place value.	5.NS.6: Understand, interpret, and model percents as part of a hundred (e.g. by using pictures, diagrams, and other visual models).
	4.NS.6: Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., $1/2 = 0.5 = 0.50$ , $7/4 = 1\ 3/4 = 1.75$ ).	
	4.NS.8: Find all factor pairs 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 in the range 1–100 is a multiple of a given one-digit number.	

3 – 5 Math Standards Vertical Alignment (2014 Language)

Computation		
Third Grade	Fourth Grade	Fifth Grade
3.C.1: Add and subtract whole numbers fluently within 1000.	4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.	
3.C.2: Represent the concept of multiplication of whole numbers with the following models: equal-sized groups, arrays, area models, and equal "jumps" on a number line. Understand the properties of 0 and 1 in multiplication.	4.C.7: Show how the order in which two numbers are multiplied (commutative property) and how numbers are grouped in multiplication (associative property) will not change the product. Use these properties to show that numbers can be multiplied in any order. Understand and use the distributive property.	5.C.3: Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
3.C.3: Represent the concept of division of whole numbers with the following models: partitioning, sharing, and an inverse of multiplication. Understand the properties of 0 and 1 in division.	4.C.3: Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and explain the reasoning.	5.C.2: Find whole-number quotients and remainders 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. Describe the strategy and explain the reasoning used.
3.C.4: Interpret whole-number quotients of whole numbers (e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each).		
3.C.5: Multiply and divide within 100 using strategies, such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$ , one knows $40 \div 5 = 8$ ), or properties of operations.	4.C.2: Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning.	
3.C.6: Demonstrate fluency with multiplication facts and corresponding division facts of 0 to 10.	4.C.4: Multiply fluently within 100.	5.C.1: Multiply multi-digit whole numbers fluently using a standard algorithmic approach.
	4.C.5: Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.	5.C.4: Add and subtract fractions with unlike denominators, including mixed numbers.
	4.C.6: Add and subtract mixed numbers with common denominators (e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction).	
		5.C.5: Use visual fraction models and numbers to multiply a fraction by a fraction or a whole number.
		5.C.6: Explain why multiplying a positive number by a fraction greater than 1 results in a product greater than the given number. Explain why multiplying a positive number by a fraction less than 1 results in a product smaller than the given number. Relate the principle of fraction equivalence, $a/b = (n \times a)/(n \times b)$ , to the effect of multiplying $a/b$ by 1.
		5.C.7: Use visual fraction models and numbers to divide a unit fraction by a non-zero whole number and to divide a whole number by a unit fraction.
		5.C.8: Add, subtract, multiply, and divide decimals to hundredths, using models or drawings and strategies based on place value or the properties of operations. Describe the strategy and explain the reasoning.
		5.C.9: Evaluate expressions with parentheses or brackets involving whole numbers using the commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property.

3 – 5 Math Standards Vertical Alignment (2014 Language)

Algebraic Thinking		
Third Grade	Fourth Grade	Fifth Grade
3.AT.1: Solve real-world problems involving addition and subtraction of whole numbers within 1000 (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	4.AT.1: Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	
3.AT.2: Solve real-world problems involving whole number multiplication and division within 100 in situations involving equal groups, arrays, and measurement quantities (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	4.AT.2: Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.	5.AT.1: Solve real-world problems involving multiplication and division of whole numbers (e.g. by using equations to represent the problem). In division problems that involve a remainder, explain how the remainder affects the solution to the problem.
3.AT.3: Solve two-step real-world problems using the four operations of addition, subtraction, multiplication and division (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	4.AT.4: Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. [In grade 4, division problems should not include a remainder.]	
3.AT.4: Interpret a multiplication equation as equal groups (e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each). Represent verbal statements of equal groups as multiplication equations.	4.AT.3: Interpret a multiplication equation as a comparison (e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.	
3.AT.5: Determine the unknown whole number in a multiplication or division equation relating three whole numbers.		
3.AT.6: Create, extend, and give an appropriate rule for number patterns using multiplication within 1000.	4.AT.6: Understand that an equation, such as $y = 3x + 5$ , is a rule to describe a relationship between two variables and can be used to find a second number when a first number is given. Generate a number pattern that follows a given rule.	5.AT.8: Define and use up to two variables to write linear expressions that arise from real-world problems, and evaluate them for given values.
	4.AT.5: Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem).	5.AT.2: Solve real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (e.g., by using visual fraction models and equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess whether the answer is reasonable.
		5.AT.3: Solve real-world problems involving multiplication of fractions, including mixed numbers (e.g., by using visual fraction models and equations to represent the problem).
		5.AT.4: Solve real-world problems involving division of unit fractions by non-zero whole numbers, and division of whole numbers by unit fractions (e.g., by using visual fraction models and equations to represent the problem).
		5.AT.5: Solve real-world problems involving addition, subtraction, multiplication, and division with decimals to hundredths, including problems that involve money in decimal notation (e.g. by using equations to represent the problem).
		5.AT.6: Graph points with whole number coordinates on a coordinate plane. Explain how the coordinates relate the point as the distance from the origin on each axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
		5.AT.7: Represent real-world problems and equations by graphing ordered pairs in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

3 – 5 Math Standards Vertical Alignment (2014 Language)

Geometry		
Third Grade	Fourth Grade	Fifth Grade
3.G.1: Identify and describe the following: cube, sphere, prism, pyramid, cone, and cylinder.		
3.G.2: Understand that shapes (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize and draw rhombuses, rectangles, and squares as examples of quadrilaterals. Recognize and draw examples of quadrilaterals that do not belong to any of these subcategories.	4.G.5: Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).	5.G.2: Identify and classify polygons including quadrilaterals, pentagons, hexagons, and triangles (equilateral, isosceles, scalene, right, acute and obtuse) based on angle measures and sides. Classify polygons in a hierarchy based on properties.
3.G.3: Identify, describe and draw points, lines and line segments using appropriate tools (e.g., ruler, straightedge, and technology), and use these terms when describing two-dimensional shapes.	4.G.1: Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).	5.G.1: Identify, describe, and draw triangles (right, acute, obtuse) and circles using appropriate tools (e.g., ruler or straightedge, compass and technology). Understand the relationship between radius and diameter.
	4.G.3: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.	
	4.G.4: Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge and technology). Identify these in two-dimensional figures.	
3.G.4: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole ( $1/2$ , $1/3$ , $1/4$ , $1/6$ , $1/8$ ).	4.G.2: Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.	

Data Analysis (and Statistics in Gr.5)		
Third Grade	Fourth Grade	Fifth Grade
3.DA.1: Create scaled picture graphs, scaled bar graphs, and frequency tables to represent a data set—including data collected through observations, surveys, and experiments—with several categories. Solve one- and two-step “how many more” and “how many less” problems regarding the data and make predictions based on the data.	4.DA.1: Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.	5.DS.1: Formulate questions that can be addressed with data and make predictions about the data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, bar graphs, and line graphs. Recognize the differences in representing categorical and numerical data.
3.DA.2: Generate measurement data by measuring lengths with rulers to the nearest quarter of an inch. Display the data by making a line plot, where the horizontal scale is marked off in appropriate units, such as whole numbers, halves, or quarters.	4.DA.2: Make a line plot to display a data set of measurements in fractions of a unit ( $1/2$ , $1/4$ , $1/8$ ). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.	
	4.DA.3: Interpret data displayed in a circle graph.	
		5.DS.2: Understand and use measures of center (mean and median) and frequency (mode) to describe a data set.

3 – 5 Math Standards Vertical Alignment (2014 Language)

Measurement		
Third Grade	Fourth Grade	Fifth Grade
3.M.1: Estimate and measure the mass of objects in grams (g) and kilograms (kg) and the volume of objects in quarts (qt), gallons (gal), and liters (l). Add, subtract, multiply, or divide to solve one-step real-world problems involving masses or volumes that are given in the same units (e.g., by using drawings, such as a beaker with a measurement scale, to represent the problem).	4.M.2: Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table. 4.M.3: Use the four operations (addition, subtraction, multiplication and division) to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	5.M.1: Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step real-world problems.
3.M.2: Choose and use appropriate units and tools to estimate and measure length, weight, and temperature. Estimate and measure length to a quarter-inch, weight in pounds, and temperature in degrees Celsius and Fahrenheit.	4.M.1: Measure length to the nearest quarter-inch, eighth-inch, and millimeter.	
3.M.3: Tell and write time to the nearest minute from analog clocks, using a.m. and p.m., and measure time intervals in minutes. Solve real-world problems involving addition and subtraction of time intervals in minutes.		
3.M.4: Find the value of any collection of coins and bills. Write amounts less than a dollar using the C symbol and write larger amounts using the S symbol in the form of dollars and cents (e.g., \$4.59). Solve real-world problems to determine whether there is enough money to make a purchase.		
3.M.5: Find the area of a rectangle with whole-number side lengths by modeling with unit squares, and show that the area is the same as would be found by multiplying the side lengths. Identify and draw rectangles with the same perimeter and different areas or with the same area and different perimeters.	4.M.4: Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems. Recognize area as additive and find the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems involving shapes.	5.M.2: Find the area of a rectangle with fractional side lengths by modeling with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
3.M.6: Multiply side lengths to find areas of rectangles with whole-number side lengths to solve real-world problems and other mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.		5.M.3: Develop and use formulas for the area of triangles, parallelograms and trapezoids. Solve real-world and other mathematical problems that involve perimeter and area of triangles, parallelograms and trapezoids, using appropriate units for measures.
3.M.7: Find perimeters of polygons given the side lengths or by finding an unknown side length.	4.M.5: Understand that an angle is measured with reference to a circle, with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. Understand an angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure other angles. Understand an angle that turns through $n$ one-degree angles is said to have an angle measure of $n$ degrees. 4.M.6: Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.	
		5.M.4: 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 or multiplying the height by the area of the base. 5.M.5: Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for right rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths to solve real-world problems and other mathematical problems. 5.M.6: Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems and other mathematical problems.