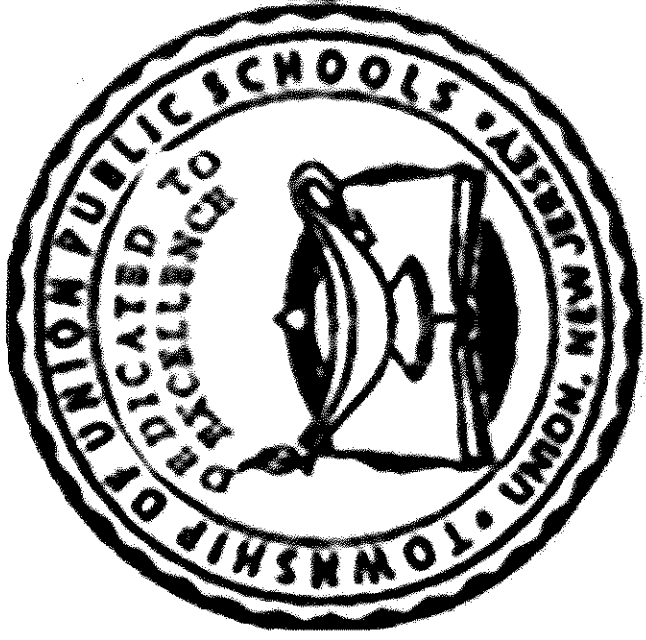


TOWNSHIP OF UNION PUBLIC SCHOOLS



**Grade 5 Mathematics**  
**Curriculum Guide 2017**  
**Adopted December, 2017**

E2a

## **Mission Statement**

The mission of the Township of Union Public Schools is to build on the foundations of honesty, excellence, integrity, strong family, and community partnerships. We promote a supportive learning environment where every student is challenged, inspired, empowered, and respected as diverse learners. Through cultivation of students' intellectual curiosity, skills and knowledge, our students can achieve academically and socially, and contribute as responsible and productive citizens of our global community.

## **Philosophy Statement**

The Township of Union Public School District, as a societal agency, reflects democratic ideals and concepts through its educational practices. It is the belief of the Board of Education that a primary function of the Township of Union Public School System is to formulate a learning climate conducive to the needs of all students in general, providing therein for individual differences. The school operates as a partner with the home and community.

### Course Description

This course is designed to cover all 5th grade New Jersey State Learning Standards as well as introduce skill sets needed to be successful in the 6th grade course. The fifth grade math curriculum is currently aligned with the NJSLs. All skills required for mastery are a part of the fifth grade learning goals. All lessons are created to address differentiated learning styles to ensure each lesson's objective is obtained by each student. The fifth grade curriculum focuses on five critical areas: (1) Number and Operations in Base 10; (2) Number and Operations - Fractions; (3) Operations and Algebraic Thinking; (4) Measurement and Data; (5) Geometry.

### Recommended Textbooks:

**GoMath – Grade 5**

Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
<b>Unit 1</b> Understanding the Place Value System	5.OA.A.1 5.OA.A.2 5.NBT.A.1 5.NBT.A.2* 5.NBT.B.5* 5.NBT.B.6 5.NBT.A.3 5.NBT.A.4	<ul style="list-style-type: none"> <li>Write and interpret numerical expressions</li> <li>Understand the place value system</li> <li>Perform operations with multi-digit whole numbers and with decimals to hundredths</li> </ul>	MP.1 Make sense of problems and persevere in solving them.
<b>Unit 1:</b> <i>Suggested Open Educational Resources</i>	5.OA.A.1 <u>Using Operations and Parentheses</u> 5.OA.A.1 <u>Watch out for Parentheses 1</u> 5.NBT.A.1 <u>Which number is it?</u> 5.NBT.A.1 <u>Millions and Billions of People</u> 5.NBT.A.3 <u>Placing Thousandths on the Number Line</u> 5.NBT.A.4 <u>Rounding to Tenths and Hundredths</u> 5.NBT.B.5 <u>Elmer's Multiplication Error</u>		MP.2 Reason abstractly and quantitatively.  MP.3 Construct viable arguments and critique the reasoning of others.
<b>Unit 2</b> Understanding Volume and Operations on Fractions	5.MD.C.3 5.MD.C.4 5.MD.C.5 5.NBT.B.5* 5.NF.A.1 5.NF.A.2 5.NF.B.3 5.NF.B.4	<ul style="list-style-type: none"> <li>Understand concepts of volume</li> <li>Perform operations with multi-digit whole numbers and with decimals to hundredths</li> <li>Use equivalent fractions as a strategy to add and subtract fractions</li> <li>Apply and extend previous understandings of multiplication and division</li> </ul>	MP.4 Model with mathematics.  MP.5 Use appropriate tools strategically.  MP.6 Attend to precision.  MP.7 Look for and make use of structure.
<b>Unit 2:</b> <i>Suggested Open Educational Resources</i>	5.MD.C.5 <u>Breaking Apart Composite Solids</u> 5.MD.C.5a <u>using Volume to Understand the Associative Property of Multiplication</u> 5.MD.C.5b <u>Cari's Aquarium</u> 5.MD.C.Box of Clay 5.NF.A.1 <u>Making S'Mores</u> 5.NF.A.2 <u>Do These Add Up?</u> 5.NF.A <u>Measuring Cups</u> 5.NF.B.3 <u>How Much Pie?</u> 5.NF.B.4b <u>Chavone's Bathroom Tiles</u>		MP.8 Look for and express regularity in repeated reasoning.

Overview	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
<p><b>Unit 3</b></p> <p><b>More Operations on Fractions</b></p>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 5.NF.B.4b</li> <li><input checked="" type="checkbox"/> 5.NF.B.5</li> <li><input checked="" type="checkbox"/> 5.NF.B.6</li> <li><input checked="" type="checkbox"/> 5.NF.B.7*</li> <li><input checked="" type="checkbox"/> 5.NBT.A.2*</li> <li><input checked="" type="checkbox"/> 5.NBT.B.7*</li> <li><input type="checkbox"/> 5.MD.A.1</li> </ul>	<ul style="list-style-type: none"> <li>• Apply and extend previous understandings of multiplication and division</li> <li>• Understand the place value system</li> <li>• Perform operations with multi-digit whole numbers and with decimals to hundredths</li> <li>• Convert like measurement units within a given measurement system</li> </ul>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p>
<p><b>Unit 3:</b></p> <p><b>Suggested Open Educational Resources</b></p>	<p>5.NF.B.4b New Park</p> <p>5.NF.B.5 Comparing Heights of Buildings</p> <p>5.NF.B.5 Grass Seedlings</p> <p>5.NF.B.5b Mrs. Gray's Homework Assignment</p> <p>5.NF.B.6 To Multiply or not to multiply?</p> <p>5.NF.B.7 Banana Pudding</p> <p>5.NBT.A.2 Multiplying Decimals by 10</p> <p>5.NBT.A.2 Marta's Multiplication Error</p> <p>5.NBT.B.7 The Value of Education</p> <p>5.MD.A.1, 5.NF.B.3 Converting Fractions of a Unit into a Smaller Unit</p>		<p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>
<p><b>Unit 4</b></p> <p><b>Coordinate Geometry and Classifying Figures</b></p>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> 5.G.A.1</li> <li><input checked="" type="checkbox"/> 5.G.A.2</li> <li><input checked="" type="checkbox"/> 5.OA.B.3</li> <li><input checked="" type="checkbox"/> 5.G.B.3</li> <li><input checked="" type="checkbox"/> 5.G.B.4</li> <li><input type="checkbox"/> 5.MD.B.2</li> <li><input checked="" type="checkbox"/> 5.NBT.B.5*</li> <li><input checked="" type="checkbox"/> 5.NBT.B.7*</li> <li><input checked="" type="checkbox"/> 5.NF.B.7*</li> </ul>	<ul style="list-style-type: none"> <li>• Graph points on the coordinate plane to solve real-world and mathematical problems</li> <li>• Analyze patterns and relationships</li> <li>• Classify two dimensional figures into categories based on their properties</li> <li>• Represent and interpret data</li> <li>• Perform operations with multi-digit whole numbers and with decimals to hundredths</li> <li>• Apply and extend previous understanding of multiplication and division</li> </ul>	
<p><b>Unit 4:</b></p> <p><b>Suggested Open Educational Resources</b></p>	<p>5.G.A.1 Battle Ship Using Grid Paper</p> <p>5.G.A.2 Meerkat Coordinate Plane Task</p> <p>5.OA.B.3 Sidewalk Patterns</p> <p>5.G.B.3 Always, Sometimes, Never</p> <p>5.G.B.4 What is a Trapezoid? (Part 2)</p> <p>5.MD.B.2 5.NF.A.1 Fractions on a Line Plot</p> <p>5.NBT.B.7, 5.NF.B.3 What is 23 divided by 5?</p> <p>5.NF.B.7c Salad Dressing</p>		

## Unit 1 Grade 5

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
© 5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	MP.1 Make sense of problems and persevere in solving them. MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): <ul style="list-style-type: none"> <li>Standard convention for performing operations (Order of operations, including grouping symbols)</li> </ul> Students are able to: <ul style="list-style-type: none"> <li>evaluate numerical expressions that include grouping symbols (parentheses, brackets or braces).</li> <li>evaluate numerical expressions that include nested grouping symbols (for example, <math>3 \times [5 + (7 - 3)]</math>).</li> </ul> Learning Goal 1: Evaluate numerical expressions that contain parentheses, brackets and braces.
© 5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation "add 8 and 7, then multiply by 2" as <math>2 \times (8 + 7)</math>. Recognize that <math>3 \times (18932 + 921)</math> is three times as large as <math>18932 + 921</math>, without having to calculate the indicated sum or product.</i>	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning	Concept(s): <ul style="list-style-type: none"> <li>Order of operations, including grouping symbols.</li> </ul> Students are able to: <ul style="list-style-type: none"> <li>write a simple numerical expression when given a verbal description.</li> <li>interpret the quantitative relationships in numerical expressions without evaluating (simplifying) the expression.</li> </ul> Learning Goal 2: Write numerical expressions when given a verbal description or word problem; interpret numerical expressions without evaluating them.
■ 5.NBT.A.1. Recognize 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 1/10 of what it represents in the place to its left.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): <ul style="list-style-type: none"> <li>Quantitative relationships exist between the digits in place value positions of a multi-digit number.</li> </ul> Students are able to: <ul style="list-style-type: none"> <li>explain that a digit in one place represents 1/10 of what it would represent in the place to its left.</li> <li>explain that a digit in one place represents ten times what it would represent in the place to its right.</li> </ul> Learning Goal 3: Explain that a digit in one place represents 1/10 of what it would represent in the place to its left and ten times what it would represent in the place to its right.
■ 5.NBT.A.2. 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.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): <ul style="list-style-type: none"> <li>Scientific notation and exponents</li> </ul> Students are able to: <ul style="list-style-type: none"> <li>explain patterns in the number of zeros of the product when multiplying a whole number by powers of 10.</li> <li>write powers of 10 using whole-number exponents.</li> </ul> Learning Goal 4: Explain patterns in the number of zeros in the product when a whole

## Unit 1 Grade 5

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>■ 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmark)</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p>	<p>number is multiplied by a power of 10; represent powers of 10 using whole-number exponents.</p> <p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>multiply a whole number of up to a four digits by a whole number of up to two digits using the standard algorithm with accuracy and efficiency.</li> </ul> <p>Learning Goal 5: Use the standard algorithm to multiply a whole number of up to a four digits by a whole number of up to two digits.</p>
<p>■ 5.NBT.B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>divide to find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using strategies based on place value, properties of operations, and the relationship between multiplication and division.</li> <li>represent these operations with equations, rectangular arrays, and area models.</li> <li>explain the calculation by referring to the model (equation, array, or area model).</li> </ul> <p>Learning Goal 6: Calculate whole number quotients of whole numbers with 4-digit dividends and 2-digit divisors; explain and represent calculations with equations, rectangular arrays, and area models.</p>
<p>■ 5.NBT.A.3. Read, write, and compare decimals to thousandths. 5.NBT.A.3a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., <math>347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)</math>. 5.NBT.A.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols to record the results of comparisons.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> <li>Multiple representations of whole numbers</li> </ul> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>read and write decimals to thousandths using base-ten numerals.</li> <li>read and write decimals to thousandths using number names.</li> <li>read and write decimals to thousandths using expanded form.</li> <li>compare two decimals to thousandths using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols.</li> <li>compare decimals when each is presented in a different form (base-ten numeral, number name, and expanded form).</li> </ul> <p>Learning Goal 7: Compare two decimals to thousandths using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> for numbers presented as base ten numerals, number names, and/or in expanded form.</p>
<p>■ 5.NBT.A.4. Use place value understanding to round decimals to any place.</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>round decimals to any place value.</li> </ul> <p>Learning Goal 8: Round decimals to any place value.</p>

**District/School Formative Assessment Plan**

*Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.*

- Self-assessment
- Fluency Fact Quizzes (Multiplication/Division facts)
- Formative tools throughout each chapter based on EACH new skill taught (given BEFORE the mid-chapter checkpoint AND after; also given BEFORE Go Math Chapter Test)
- Reteach/Enrich Supplemental worksheets (to help classify different abilities)
- iReady Teacher Toolbox activities
- Small group direct instruction for struggling learners -One-on-one instruction (as needed)
- Communicating in pairs, small group, or whole group presentations
- Teacher observation
- Student reflections/quick-writes on a particular lesson/skill
- Homework
- Daily Math Journal (Word Problem of the Day)
- Inquiry-oriented and exploratory approach
- Goalbook Pathways
- Standards Mastery

**District/School Summative Assessment Plan**

*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

- Chapter Review
- Mid-chapter Checkpoints
- Chapter 1 Test
- Standards Assessment
- Performance Assessment Task
- Digital Personal Math Trainer
- iReady Diagnostic / Growth Check
- Ed Connect / Benchmark Test
- ECR – Extended Constructive Response
- PARCC- style assessments

**Focus Mathematical Concepts**

*Districts should consider listing prerequisites skills. Concepts that include a focus on relationships and representation might be listed as grade level appropriate.*

Prerequisite skills: Reading and writing whole numbers up to the hundred thousands place; recall multiplication and division facts up to 12; divide multi-digit number by one digit; read and write decimals to the hundredths place

Common Misconceptions: Students learn multiplication and division facts up to 12, but there is poor recall, therefore drills are needed.

Number Fluency (for grades K-5):

Grade	Required Fluencies
K	Add/Subtract within 5
1	Add/Subtract within 10
2	Add/Subtract within 20
3	Add/Subtract within 1,000 ; Multiplication and Division Facts 0-10
4	Fluently add and subtract multi-digit whole numbers using the standard



5	<p>algorithm; Multiplication and Division Facts 0-12 Fluently add and subtract multi-digit whole numbers; Multiplication and Division Facts 0-12; Add and Subtract Benchmark Decimals and Fractions</p>	<p><b>District/School Primary and Supplementary Resources</b> <i>District/school resources and supplementary resources that are texts as well as digital resources used to support the instruction.</i></p> <ul style="list-style-type: none"> <li>- Interactive Student Edition</li> <li>- Personal Math Trainer</li> <li>- Math On the Spot video</li> <li>- Real World Videos</li> <li>- iReady Teacher Toolbox</li> <li>- Illustrative Math <a href="https://www.illustrativemathematics.org/">https://www.illustrativemathematics.org/</a></li> <li>- The Teaching Channel has two hundred math videos for professional development. <a href="http://www.theteachingchannel.org">http://www.theteachingchannel.org</a></li> </ul>
<b>Instructional Best Practices and Exemplars</b>		
<i>This is a place to capture examples of standards integration and instructional best practices.</i>		
<ul style="list-style-type: none"> <li>- Problem of the Day</li> <li>- Differentiated Instruction based on students' individual needs</li> <li>- Learning Centers</li> <li>- Explicit teacher modeling of how to provide appropriate rationales for math work</li> <li>- Turn and Talk</li> <li>- Peer tutoring</li> <li>- Encouraging and facilitating the sharing of mathematical ideas, discussing mathematics amongst each other, and how to refine and critique each other's ideas and understandings</li> <li>- Making interdisciplinary connections using reading texts</li> </ul>	<p><b>District/School Tasks</b> <i>Exemplar tasks or illustrative models could be provided.</i></p> <ul style="list-style-type: none"> <li>- Animated Go Math models</li> <li>- GO Math iTools</li> <li>- Grab and Go Differentiated activities (Go Math)</li> <li>- Using technological resources and other 21st century skills to support and enhance mathematical understanding</li> <li>- Using connections between pictures, oral language, written symbols, manipulative models, and real-world situations</li> </ul>	<p><b>Content Standards</b></p> <ul style="list-style-type: none"> <li>5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</li> <li>5.MD.C.5a. A cube with side length 1 unit, called a "unit</li> </ul>
<b>Unit 2 Grade 5</b>		
<p><b>Content Standards</b></p> <ul style="list-style-type: none"> <li>5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.</li> <li>5.MD.C.5a. A cube with side length 1 unit, called a "unit</li> </ul>	<p><b>Suggested Standards for Mathematical Practice</b></p> <p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools</p>	<p><b>Critical Knowledge &amp; Skills</b></p> <p>Concept(s):</p> <ul style="list-style-type: none"> <li>• Volume is the amount of space inside a solid (3-dimensional) figure.</li> <li>• Cubes with side length of 1 unit, called "a unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.</li> <li>• Solid figures which can be packed without gaps or overlaps using <math>n</math> unit cubes is said to have a volume of <math>n</math> cubic units.</li> </ul>

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## Suggested Standards for Mathematical Practice

<p>cube," is said to have "one cubic unit" of volume, and can be used to measure volume.</p> <p>5.MD.C.5b. A solid figure which can be packed without gaps or overlaps using <math>n</math> unit cubes is said to have a volume of <math>n</math> cubic units.</p> <p>5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.</p> <p>5.MD.C.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p> <p>5.MD.C.5a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.</p> <p>5.MD.C.5b. Apply the formulas <math>V = l \times w \times h</math> and <math>V = B \times h</math> for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.</p> <p>5.MD.C.5c. Recognize volume as additive. Find volumes of solid figures</p>	<p>strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<ul style="list-style-type: none"> <li>Volume of a solid can be determined using unit cubes of other dimensions. Students are able to:             <ul style="list-style-type: none"> <li>count unit cubes in order to measure the volume of a solid.</li> <li>use unit cubes of centimeters, inches, and/or other units to measure volume.</li> </ul> </li> </ul> <p>Learning Goal 1: Measure volume by counting the total number cubic units required to fill a figure without gaps or overlaps.</p>
<p>5.MD.C.5a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.</p> <p>5.MD.C.5b. Apply the formulas <math>V = l \times w \times h</math> and <math>V = B \times h</math> for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.</p> <p>5.MD.C.5c. Recognize volume as additive. Find volumes of solid figures</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> <li>Volume is additive: volumes of composite solids can be determined by adding the volumes of each solid.</li> </ul> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>pack right rectangular prisms with cubes to find volume and multiply side lengths of the right rectangular prism to find volume, showing that they are the same.</li> <li>pack right rectangular prisms with cubes to find volume and multiply height by the area of the base, showing that they are the same.</li> <li>explain how both volume formulas relate to counting the cubes in one layer and multiplying that value by the number of layers (height).</li> <li>write the volume of an object as the product of three whole numbers.</li> <li>solve real-world and mathematical problems using the formulas <math>V = l \times w \times h</math> and <math>V = B \times h</math>.</li> <li>find the volume of a composite solid composed of two right rectangular prisms.</li> </ul> <p>Learning Goal 2: Show that the volume of a right rectangular prism found by counting all the unit cubes is the same as the formulas <math>V = l \times w \times h</math> or <math>V = B \times h</math>.</p> <p>Learning Goal 3: Apply formulas to solve real world and mathematical problems involving volumes of right rectangular prisms that have whole number edge lengths.</p> <p>Learning Goal 4: Find the volume of a composite solid figure composed of two non-overlapping right rectangular prisms, applying this strategy to solve real-world problems.</p>

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<p>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.</p>		
<p>5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmark)</p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>multiply multi-digit whole numbers with accuracy and efficiency.</li> </ul> <p>Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.</p>
<p>5.NF.A.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. <i>For example, <math>\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}</math> (in general, <math>\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}</math>).</i></p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> <li>Equivalent fractions can be used to add and subtract fractions.</li> </ul> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>produce an equivalent sum (or difference) of fractions with like denominators from the original sum (or difference) of fractions that has unlike denominators.</li> <li>add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions.</li> </ul> <p>Learning Goal 6: Add and subtract fractions (including mixed numbers) with unlike denominators by replacing the given fractions with equivalent fractions having like denominators</p>
<p>5.NF.A.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. <i>For example, recognize an incorrect result <math>\frac{2}{5} + \frac{1}{2} = \frac{3}{7}</math>, by observing that <math>\frac{3}{7} &lt; \frac{1}{2}</math>.</i></p>	<p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>add and subtract fractions, including mixed numbers, with unlike denominators to solve word problems.</li> <li>represent calculations and solutions with visual fraction models and equations</li> <li>estimate answers using benchmark fractions and explain whether the answer is reasonable.</li> <li>estimate answers by reasoning about the size of the fractions and explain whether the answer is reasonable.</li> </ul> <p>Learning Goal 7: Solve word problems involving adding or subtracting fractions with unlike denominators, and determine if the answer to the word problem is reasonable, using estimations with benchmark fractions.</p>
<p>5.NF.B.3. Interpret a fraction as</p>	<p>MP.1 Make sense of problems and</p>	<p>Concept(s):</p>

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>division of the numerator by the denominator (<math>a/b = a \div b</math>). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.</p> <p><i>For example, interpret <math>3/4</math> as the result of dividing 3 by 4, noting that <math>3/4</math> multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size <math>3/4</math>. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?</i></p>	<p>persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<ul style="list-style-type: none"> <li>Fractions represent division. Students are able to:             <ul style="list-style-type: none"> <li>represent a fraction as a division statement (<math>a/b = a \div b</math>).</li> <li>divide whole numbers in order to solve real world problems, representing the quotient as a fraction or a mixed number.</li> <li>represent word problems involving division of whole numbers using visual fraction models and equations.</li> </ul> </li> </ul> <p>Learning Goal 8: Interpret a fraction as a division of the numerator by the denominator; solve word problems in which division of whole numbers leads to fractions or mixed numbers as solutions.</p>
<p>5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</p> <p>5.NF.B.4a. Interpret the product <math>(a/b) \times q</math> as <math>a</math> parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>. <i>For example, use a visual fraction model to show <math>(2/3) \times 4 = 8/3</math>, and create a story context for this equation. Do the same with <math>(2/3) \times (4/5) = 8/15</math>. (In general, <math>(a/b) \times (c/d) = ac/bd</math>.)</i></p> <p>5.NF.B.4b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>for whole number or fraction <math>q</math>, represent <math>(a/b) \times q</math> as <math>a</math> parts of a partition of <math>q</math> into <math>b</math> equal parts [e.g. using a visual fraction model, <math>(3/4) \times 5</math> can be represented by 3 parts, after partitioning 5 objects into 4 equal parts].</li> <li>for whole number or fraction <math>q</math>, represent <math>(a/b) \times q</math> as <math>a \times q \div b</math> [e.g. showing that <math>(2/5) \times 3</math> is equivalent to <math>(2 \times 3) \div 5</math>].</li> <li>from a story context, interpret <math>(a/b) \times q</math> as <math>a</math> parts of a partition of <math>q</math> into <math>b</math> equal parts.</li> <li>tile a rectangle having fractional side lengths using unit squares of the appropriate unit fraction [e.g. given a <math>3 \frac{1}{4}</math> inch <math>\times</math> <math>7 \frac{3}{4}</math> inch rectangle, tile the rectangle using <math>\frac{1}{4}</math> inch tiles].</li> <li>show that the area found by tiling with unit fraction tiles is the same as would be found by multiplying the side lengths.</li> </ul> <p>Learning Goal 9: For whole number or fraction <math>q</math>, interpret the product <math>(a/b) \times q</math> as <math>a</math> parts of a whole partitioned into <math>b</math> equal parts added <math>q</math> times (e.g. using a visual fraction model).</p> <p>Learning Goal 10: Tile a rectangle with unit fraction squares to find the area and multiply side lengths to find the area of the rectangle, showing that the areas are the same.</p>

## Unit 2 Grade 5

## Critical Knowledge &amp; Skills

## Suggested Standards for Mathematical Practice

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.

## Unit 2 Grade 5 What This May Look Like

## District/School Formative Assessment Plan

*Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.*

- Self-assessment
- Fluency Fact Quizzes (Multiplication/Division facts)
- Formative tools throughout each chapter based on EACH new skill taught (given BEFORE the mid-chapter checkpoint AND after; also given BEFORE Go Math Chapter Test)
- Reteach/Enrich Supplemental worksheets (to help classify different abilities)
- iReady Teacher Toolbox activities
- Small group direct instruction for struggling learners -One-on-one instruction (as needed)
- Communicating in pairs, small group, or whole group presentations
- Teacher observation
- Student reflections/quick-writes on a particular lesson/skill
- Homework
- Daily Math Journal (Word Problem of the Day)
- Goalbook Pathways
- Standards Mastery

## District/School Summative Assessment Plan

*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

- Chapter Review
- Mid-chapter Checkpoints
- Chapter Test (6,11)
- Standards Assessment
- Performance Assessment Task
- Digital Personal Math Trainer
- iReady Diagnostic / Growth Check
- Ed Connect / Benchmark Test
- ECR – Extended Constructive Response
- PARCC- style assessments

## Focus Mathematical Concepts

*Districts should consider listing prerequisites skills. Concepts that include a focus on relationships and representation might be listed as grade level appropriate.*  
Prerequisite skills: Students should be able to find equivalent fractions using a common denominator. Students should be able to add fractions with like and unlike denominators.

Common Misconceptions: Students are able to convert improper fractions to mixed numbers and vice versa.

## Number Fluency (for grades K-5):

Grade	Required Fluencies
K	Add/Subtract within 5
1	Add/Subtract within 10
2	Add/Subtract within 20
3	Add/Subtract within 1,000 ; Multiplication and Division Facts 0-10
4	Fluently add and subtract multi-digit whole numbers using the standard algorithm; Multiplication and Division Facts 0-12
5	Fluently add and subtract multi-digit whole numbers; Multiplication and Division Facts 0-12; Add and Subtract Benchmark Decimals and Fractions

**District/School Tasks**

*Exemplar tasks or illustrative models could be provided.*

- Animated Go Math models
- GO Math iTools
- Grab and Go Differentiated activities (Go Math)
- Using technological resources and other 21st century skills to support and enhance mathematical understanding
- Using connections between pictures, oral language, written symbols, manipulative models, and real-world situations

**District/School Primary and Supplementary Resources**

*District/school resources and supplementary resources that are texts as well as digital resources used to support the instruction.*

- Interactive Student Edition
- Personal Math Trainer
- Math On the Spot video
- Real World Videos
- iReady Teacher Toolbox
- Illustrative Math <https://www.illustrativemathematics.org/>
- The Teaching Channel has two hundred math videos for professional development. <http://www.theteachingchannel.org>

**Instructional Best Practices and Exemplars**

*This is a place to capture examples of standards integration and instructional best practices.*

- Problem of the Day
- Differentiated Instruction based on students' individual needs
- Learning Centers
- Explicit teacher modeling of how to provide appropriate rationales for math work
- Turn and Talk
- Peer tutoring
- Encouraging and facilitating the sharing of mathematical ideas, discussing mathematics amongst each other, and how to refine and critique each other's ideas and understandings
- Making interdisciplinary connections using reading texts



Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.</p> <p>5.NF.B.4b. Find the area of a rectangle with fractional side lengths by tiling it 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.</p>	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>multiply fractional side lengths to find areas of rectangles.</li> <li>represent fraction products as rectangular areas.</li> <li>multiply a fraction by a whole number.</li> <li>multiply a fraction by a fraction, in general, if <math>q</math> is a fraction <math>c/d</math>, then <math>(a/b) \times (c/d) = a(1/b) \times c(1/d) = ac \times (1/b)(1/d) = ac(1/bd) = ac/bd</math>.</li> </ul> <p>Learning Goal 1: Multiply fractions by whole numbers and fractions by fractions, drawing visual models to represent products, showing <math>(a/b) \times (c/d) = ab(1/bd)</math>, and creating story contexts.</p>
<p>5.NF.B.5. Interpret multiplication as scaling (resizing), by:</p> <p>5.NF.B.5a. Comparing 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.</p> <p>5.NF.B.5b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence <math>a/b = (n \times a)/(n \times b)</math> to the effect of multiplying <math>a/b</math> by 1.</p>	<p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.4 Model with mathematics.</p> <p>MP.6 Attend to precision.</p> <p>MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> <li>Multiplication as resizing (scaling)</li> </ul> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>compare the size of a product to the size of one of its factors, considering the size of the other factor (at least one factor is a fraction).</li> <li>explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number.</li> <li>explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.</li> <li>explain that multiplying a given number by a fraction equivalent to 1 does not change the product.</li> </ul> <p>Learning Goal 2: Explain how a product is related to the magnitude of the factors, including cases in which one factor is a fraction greater than 1 and cases in which one factor is a fraction less than 1.</p>
<p>5.NF.B.6. Solve real world problems involving multiplication of fractions and mixed numbers,</p>	<p>MP.4 Model with mathematics.</p> <p>MP.1 Make sense of problems and persevere in solving them.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>multiply fractions and mixed numbers in order to solve real world problems.</li> </ul>



Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>e.g., by using visual fraction models or equations to represent the problem.</p>	<p>MP.2 Reason abstractly and quantitatively.            MP.3 Construct viable arguments and critique the reasoning of others.            MP.5 Use appropriate tools strategically.            MP.6 Attend to precision.            MP.7 Look for and make use of structure.            MP.8 Look for and express regularity in repeated reasoning.</p>	<ul style="list-style-type: none"> <li>represent the solution to these real world problems with visual fraction models and equations.</li> </ul> <p>Learning Goal 3: Solve real-world problems involving multiplication of fractions (including mixed numbers), using visual fraction models or equations to represent the problem.</p>
<p>5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *(benchmark)</p> <p>5.NF.B.7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. <i>For example, create a story context for <math>(1/3) \div 4</math>, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that <math>(1/3) \div 4 = 1/12</math> because <math>(1/12) \times 4 = 1/3</math>.</i></p> <p>5.NF.B.7b. Interpret division of a whole number by a unit fraction, and compute such quotients. <i>For example, create a story context for <math>4 \div (1/5)</math>, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that <math>4 \div (1/5) = 20</math> because <math>20 \times (1/5) = 4</math>.</i></p> <p>5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g.,</p>	<p>MP.1 Make sense of problems and persevere in solving them.            MP.2 Reason abstractly and quantitatively.            MP.3 Construct viable arguments and critique the reasoning of others.            MP.4 Model with mathematics.            MP.5 Use appropriate tools strategically.            MP.6 Attend to precision.            MP.7 Look for and make use of structure.            MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Concept(s): No new concept(s) introduced            Students are able to:</p> <ul style="list-style-type: none"> <li>use a story context to interpret division of a unit fraction by a whole number.</li> <li>divide of a unit fraction by a whole number and represent with visual fraction models.</li> <li>use a story context to interpret division of a whole number by a unit fraction.</li> <li>divide of a whole number by a unit fraction and represent with visual fraction models.</li> <li>divide unit fractions by whole numbers to solve real-world problems, using visual fraction models and equations to represent the problem.</li> <li>divide whole numbers by unit fractions to solve real-world problems, using visual fraction models and equations to represent the problem.</li> </ul> <p>Learning Goal 4: Divide a unit fraction by a non-zero whole number and interpret by creating a story context or visual fraction model.</p> <p>Learning Goal 5: Divide a whole number by a unit fraction and interpret by creating a story context or visual fraction model.</p> <p>Learning Goal 6: Solve real-world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.</p>

Unit 3 Grade 5		
Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>by using visual fraction models and equations to represent the problem. <i>For example, how much chocolate will each person get if 3 people share <math>\frac{1}{2}</math> lb of chocolate equally? How many <math>\frac{1}{3}</math>-cup servings are in 2 cups of raisins?</i></p> <p>■ 5.NBT.A.2. 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.</p> <p>■ 5.NBT.B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *(benchmark)</p>	<p>MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p> <p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.</p> <p>MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>explain patterns in the placement of the decimal point when multiplying or dividing a decimal by powers of 10.</li> <li>write powers of 10 using whole-number exponents.</li> </ul> <p>Learning Goal 7: Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10; represent powers of 10 using whole-number exponents.</p> <p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>add and subtract decimals to hundredths using concrete models and drawings.</li> <li>multiply and divide decimals to hundredths using concrete models and drawings.</li> <li>add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</li> <li>relate the strategy to the written method and explain the reasoning used.</li> </ul> <p>Learning Goal 8: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; explain the reasoning used, relating the strategy to the written method.</p> <p>Concept(s): Measurement units can be converted within a given measurement system. Students are able to:</p> <ul style="list-style-type: none"> <li>convert from one measurement unit to another within a given measurement system (e.g., convert 5 cm to 0.05 m, convert minutes to hours).</li> <li>solve multi-step, real world problems that require conversions.</li> </ul> <p>Learning Goal 9: Convert standard measurement units within the same system (e.g., centimeters to meters) in order to solve multi-step problems.</p>
Unit 3 Grade 5 What This May Look Like		
District/School Formative Assessment Plan		District/School Summative Assessment Plan

*Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.*

- Self-assessment
- Fluency Fact Quizzes (Multiplication/Division facts)
- Formative tools throughout each chapter based on EACH new skill taught (given BEFORE the mid-chapter checkpoint AND after; also given BEFORE Go Math Chapter Test)
- Reteach/Enrich Supplemental worksheets (to help classify different abilities)
- iReady Teacher Toolbox activities
- Small group direct instruction for struggling learners -One-on-one instruction (as needed)
- Communicating in pairs, small group, or whole group presentations
- Teacher observation
- Goalbook Pathways
- Standards Mastery

*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

- Chapter Review
- Mid-chapter Checkpoints
- Chapter Test (Ch.3,4,5,7,8,10)
- Standards Assessment
- Performance Assessment Task
- Digital Personal Math Trainer
- iReady Diagnostic / Growth Check
- Ed Connect / Benchmark Test
- ECR – Extended Constructive Response
- PARCC- style assessments

### Focus Mathematical Concepts

*Districts should consider listing prerequisites skills. Concepts that include a focus on relationships and representation might be listed as grade level appropriate.*

**Prerequisite skills:** Students should be able to identify common multiples and factors. Students should be able to multiply and divide whole numbers. Students should be able to simplify fractions. Students should understand place value of the decimal system.

**Common Misconceptions:** Students confuse factors and multiples. Students often add the denominators instead of finding a common denominator. Students confuse the multiplication and division process of fractions. Students confuse the decimal rules for each operation.

**Number Fluency (for grades K-5):**

Grade	Required Fluencies
K	Add/Subtract within 5
1	Add/Subtract within 10
2	Add/Subtract within 20
3	Add/Subtract within 1,000 ; Multiplication and Division Facts 0-10
4	Fluently add and subtract multi-digit whole numbers using the standard algorithm; Multiplication and Division Facts 0-12
5	Fluently add and subtract multi-digit whole numbers; Multiplication and Division Facts 0-12; Add and Subtract Benchmark Decimals and Fractions

### District/School Tasks

*Exemplar tasks or illustrative models could be provided.*

- Animated Go Math models

### District/School Primary and Supplementary Resources

*District/school resources and supplementary resources that are texts as well as digital resources used to support the instruction.*

- Interactive Student Edition

- GO Main iTools
- Grab and Go Differentiated activities (Go Math)
- Using technological resources and other 21st century skills to support and enhance mathematical understanding
- Using connections between pictures, oral language, written symbols, manipulative models, and real-world situations

- Personal Math Trainer
- Math On the Spot video
- Real World Videos
- iReady Teacher Toolbox
- Illustrative Math <https://www.illustrativemathematics.org/>
- The Teaching Channel has two hundred math videos for professional development. <http://www.theteachingchannel.org>

#### Instructional Best Practices and Exemplars

*This is a place to capture examples of standards integration and instructional best practices.*

- Problem of the Day
- Differentiated Instruction based on students' individual needs
- Learning Centers
- Explicit teacher modeling of how to provide appropriate rationales for math work
- Turn and Talk
- Peer tutoring
- Encouraging and facilitating the sharing of mathematical ideas, discussing mathematics amongst each other, and how to refine and critique each other's ideas and understandings
- Making interdisciplinary connections using reading texts

#### Unit 4 Grade 5

##### Critical Knowledge & Skills

##### Content & Practice Standards

© 5.G.A.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention

##### Suggested Standards for Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.  
 MP.2 Reason abstractly and quantitatively.  
 MP.4 Model with mathematics.  
 MP.5 Use appropriate tools strategically.  
 MP.6 Attend to precision.  
 MP.7 Look for and make use of structure.

##### Concept(s):

- Coordinate plane as perpendicular number lines.
- Perpendicular number lines (axes) define a coordinate system.
- Intersection of the lines (origin) coincides with the 0 on each number line.
- Given points in the plane is located using an ordered pair of numbers (coordinates).
- First numbers in an ordered pair indicates how far to travel from the origin in the direction of the x-axis.
- Second numbers in an ordered pair indicate how far to travel in the direction of the y-axis.

Students are able to:

- graph points defined by whole number coordinates in the first quadrant of the coordinate plane in order to represent real world and mathematical problems.
- interpret coordinates in context.

Learning Goal 1: Represent real world and mathematical problems by graphing points defined by whole number coordinates in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p>that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).</p> <p>© 5.G.A.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.</p>		
<p>© 5.OA.A.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. <i>For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i></p>	<p>MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced Students are able to:</p> <ul style="list-style-type: none"> <li>• use two rules to create two numerical patterns.</li> <li>• compare corresponding terms (e.g. compare the first terms in each list, compare the second terms in each list, etc).</li> <li>• identify the relationship between corresponding terms and write ordered pairs.</li> <li>• graph the ordered pairs.</li> </ul> <p>Learning Goal 2: Generate two numerical patterns from two given rules, identify the relationship between corresponding terms, create ordered pairs and graph the ordered pairs.</p>
<p>© 5.G.B.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. <i>For example, all rectangles have four right angles and squares are rectangles, so</i></p>	<p>MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.</p>	<p>Concept(s):</p> <ul style="list-style-type: none"> <li>• Attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.</li> </ul> <p>Students are able to:</p> <ul style="list-style-type: none"> <li>• classify two-dimensional figures (triangles, quadrilaterals) based on shared attributes (e.g. parallel sides, number of sides, angle size, side length, etc.).</li> <li>• arrange the categories/subcategories of figures (e.g. squares, rectangles, trapezoids, etc) in a hierarchy based on attributes.</li> <li>• identify attributes of a two-dimensional shape based on attributes of the categories to</li> </ul>

Content & Practice Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
<p><i>all squares have four right angles.</i></p> <p>© 5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties.</p>		<p>Learning Goal 3: Classify two-dimensional figures in a hierarchy based on properties. which it belongs.</p>
<p>▣ 5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit (<math>1/2</math>, <math>1/4</math>, <math>1/8</math>). Use operations on fractions for this grade to solve problems involving information presented in line plots. <i>For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.</i></p>	<p>MP.1 Make sense of problems and persevere in solving them.          MP.2 Reason abstractly and quantitatively.          MP.4 Model with mathematics.          MP.5 Use appropriate tools strategically.          MP.6 Attend to precision.          MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced          Students are able to:</p> <ul style="list-style-type: none"> <li>use measurement information to create a line plot.</li> <li>using measurement information presented in line plots, add, subtract, multiply and divide fractions in order to solve problems.</li> </ul> <p>Learning Goal 4: Make a line plot to display a data set in measurements in fractions of a unit (<math>1/2</math>, <math>1/4</math>, <math>1/8</math>) and use it to solve problems involving the four operations on fractions with unlike denominators.</p>
<p>▣ 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmark)</p>	<p>MP.2 Reason abstractly and quantitatively.          MP.3 Construct viable arguments and critique the reasoning of others.          MP.4 Model with mathematics.          MP.5 Use appropriate tools strategically.          MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced          Students are able to:</p> <ul style="list-style-type: none"> <li>multiply multi-digit whole numbers with accuracy and efficiency.</li> </ul> <p>Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.</p>
<p>▣ 5.NBT.B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning</p>	<p>MP.2 Reason abstractly and quantitatively.          MP.3 Construct viable arguments and critique the reasoning of others.          MP.4 Model with mathematics.          MP.5 Use appropriate tools strategically.          MP.7 Look for and make use of structure.</p>	<p>Concept(s): No new concept(s) introduced          Students are able to:</p> <ul style="list-style-type: none"> <li>add and subtract decimals to hundredths using concrete models and drawings.</li> <li>multiply and divide decimals to hundredths using concrete models and drawings.</li> <li>add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</li> <li>relate the strategy to the written method and explain the reasoning used.</li> </ul> <p>Learning Goal 6: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; explain</p>

## Unit 4 Grade 5

## Critical Knowledge &amp; Skills

the reasoning used, relating the strategy to the written method.

- Concept(s): No new concept(s) introduced  
Students are able to:
- use a story context to interpret division of a unit fraction by a whole number.
  - use a story context to interpret division of a whole number by a unit fraction.
  - divide unit fractions by whole numbers to solve real world problems, using visual fraction models and equations to represent the problem.
  - divide whole numbers by unit fractions to solve real world problems, using visual fraction models and equations to represent the problem.

Learning Goal 7: Solve real world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.

## Suggested Standards for Mathematical Practice

- MP.1 Make sense of problems and persevere in solving them.  
MP.2 Reason abstractly and quantitatively.  
MP.3 Construct viable arguments and critique the reasoning of others.  
MP.4 Model with mathematics.  
MP.5 Use appropriate tools strategically.  
MP.6 Attend to precision.  
MP.7 Look for and make use of structure.  
MP.8 Look for and express regularity in repeated reasoning.

5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. \*(benchmark)

5.NF.B.7c. 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. *For example, how much chocolate will each person get if 3 people share  $\frac{1}{2}$  lb of chocolate equally? How many  $\frac{1}{3}$ -cup servings are in 2 cups of raisins?*

## Unit4 Grade 5 What This May Look Like

## District/School Formative Assessment Plan

- Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.*
- Self-assessment
  - Fluency Fact Quizzes (Multiplication/Division facts)
  - Formative tools throughout each chapter based on EACH new skill taught (given BEFORE the mid-chapter checkpoint AND after; also given BEFORE Go Math Chapter Test)
  - Reteach/Enrich Supplemental worksheets (to help classify different abilities)
  - iReady Teacher Toolbox activities
  - Small group direct instruction for struggling learners -One-on-one instruction (as needed)
  - Communicating in pairs, small group, or whole group presentations
  - Teacher observation

## District/School Summative Assessment Plan

- Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*
- Chapter Review
  - Mid-chapter Checkpoints
  - Chapter Test (Ch. 9)
  - Standards Assessment
  - Performance Assessment Task
  - Digital Personal Math Trainer
  - iReady Diagnostic / Growth Check
  - Ed Connect / Benchmark Test
  - ECR – Extended Constructive Response
  - PARCC- style assessments

- Goalbook Pathways
- Standards Mastery

### Focus Mathematical Concepts

*Districts should consider listing prerequisites skills. Concepts that include a focus on relationships and representation might be listed as grade level appropriate.*  
 Prerequisite skills: Students should be able to plot and locate a point on a coordinate grid. Students should be able to identify and classify geometric figures.

Common Misconceptions: Students confuse x and y on a coordinate grid. Students have a lack of geometric vocabulary.

Number Fluency (for grades K-5):

Grade	Required Fluencies
K	Add/Subtract within 5
1	Add/Subtract within 10
2	Add/Subtract within 20
3	Add/Subtract within 1,000 ; Multiplication and Division Facts 0-10
4	Fluently add and subtract multi-digit whole numbers using the standard algorithm; Multiplication and Division Facts 0-12
5	Fluently add and subtract multi-digit whole numbers; Multiplication and Division Facts 0-12; Add and Subtract Benchmark Decimals and Fractions

### District/School Tasks

*Exemplar tasks or illustrative models could be provided.*

- Animated Go Math models
- GO Math iTools
- Grab and Go Differentiated activities (Go Math)
- Using technological resources and other 21st century skills to support and enhance mathematical understanding
- Using connections between pictures, oral language, written symbols, manipulative models, and real-world situations

### District/School Primary and Supplementary Resources

*District/school resources and supplementary resources that are texts as well as digital resources used to support the instruction.*

- Interactive Student Edition
- Personal Math Trainer
- Math On the Spot video
- Real World Videos
- iReady Teacher Toolbox
- Illustrative Math <https://www.illustrativemathematics.org/>
- The Teaching Channel has two hundred math videos for professional development. <http://www.theteachingchannel.org>

### Instructional Best Practices and Exemplars

*This is a place to capture examples of standards integration and instructional best practices.*

- Problem of the Day
- Differentiated Instruction based on students' individual needs
- Learning Centers
- Explicit teacher modeling of how to provide appropriate rationales for math work
- Turn and Talk
- Peer tutoring



## Gr 5

- Encouraging and facilitating the sharing of mathematical ideas, discussing mathematics amongst each other, and how to refine and critique each other's ideas and understandings
- Making interdisciplinary connections using reading texts