

## 2nd Grade Mathematics - Elmbrook School District

Curriculum Area: Mathematics	Grade Level: 2
Date last reviewed: December 9, 2015	Board approval date: February 3, 2016

### Desired Results:

Course Description and Purpose: This framework for improving student learning focuses on high-quality math standards. It provides teachers with a clear set of math concepts and skills for students to understand and be able to do by the end of the school year.

Enduring Understanding:	Essential Questions:
<p><b>Numbers and Operations in Base Ten</b></p> <ul style="list-style-type: none"> <li>● Our base 10 number system determines a digit's value.</li> <li>● There are multiple representations for any number.</li> <li>● Numbers can be used to count, label, order, identify, measure and describe things and experiences.</li> <li>● Numbers have patterns.</li> <li>● Numbers can represent quantity, position, location, and relationships.</li> <li>● Numbers can be composed and decomposed.</li> </ul> <p><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li>● Flexible methods of computation involve grouping numbers in strategic ways.</li> <li>● Estimation is a way to get an approximate</li> </ul>	<p><b>Numbers and Operations in Base Ten</b></p> <ul style="list-style-type: none"> <li>● How are numbers related?</li> <li>● How can numbers be expressed, ordered, and compared?</li> <li>● In what ways can numbers be composed and decomposed?</li> <li>● How can patterns help solve problems?</li> </ul> <p><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li>● How do mathematical operations relate to each other?</li> <li>● How do I know which mathematical operation to</li> </ul>

answer.

- Proficiency with basic facts aids computation of larger and smaller numbers.
- There is a relationship between addition and subtraction.

#### Measurement and Data

- Standard units provide a common language for communicating measurement accurately.
- The choice of measurement tools depends on the degree of precision desired.
- Data can be organized in meaningful ways so that it can be interpreted and analyzed.
- The expected outcome of an event is a prediction of what might happen in the long run.
- Time is measured in hours and minutes.

#### Geometry

- Objects can be described, compared, and classified by geometric attributes.
- Many geometric shapes can be divided into equal parts.
- A fraction describes the division of a whole into equal parts.

use?

- In what ways can you compute math problems?
- What are strategies for making a reasonable estimate?  
Why is estimation an important skill?
- In what ways do basic facts help you compute larger or smaller numbers efficiently?

#### Measurement and Data

- How is time used?
- How and why do we organize information?
- Why should we have standard units of measurement?
- When is an estimation more appropriate than an actual measurement?

#### Geometry

- How can objects be described, compared, and classified?
- How would you divide a whole shape or set into equal parts?

**Assessment Evidence:**

Formative Assessments:	Summative Assessments:
Unit Pre-Assessments Daily formative slate checks Writing and Reasoning Daily RSA's Exit Slips	Unit Post-Assessments <a href="#">Quarterly Fact Fluency Assessments</a> MAP (Measures of Academic Progress) Testing

### Instructional Outline:

Mathematical Practice Standards
<ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>

Operations and Algebraic Thinking (OA)
Represent and solve problems involving addition and subtraction (2.OA.1)

Standards:	I Can Statements:	Essential Elements:
<p><b>OA.1</b> Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p>	<p>I understand the meaning of the addition and subtraction sign.</p> <p>I can solve an addition number story or write a number story to describe a picture or number sentence.</p> <p>I can solve one and two step addition/subtraction number stories and write a matching open number model with a variable for the unknown in all positions.</p> <p>I can plot measurements on an open number line to solve addition and subtraction number stories and write the corresponding number model using a symbol for the unknown.</p> <p>I can give equivalent names for numbers, including writing number models.</p>	<p>*Not applicable. See <b>EE.3.OA.4.</b></p>
<b>Add and subtract within 20 (2.OA.2)</b>		
Standards:	I Can Statements:	Essential Elements:
<p><b>OA.2</b> Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.  <i>*See standard 1.OA.C.6. for a list of mental</i></p>	<p>I can give equivalent names for numbers, including writing number models.</p> <p>I can fluently add/subtract within 20</p>	<p>*Not applicable. See <b>EE.2.NBT.6-7</b> and <b>EE.3.OA.4.</b></p>

<p><i>strategies.</i></p>	<p>within mental strategies.</p> <p>I can know from memory all sums of 2 one digit numbers.</p> <p>I can write number sentences form a group of numbers.</p> <p>I can construct fact families for addition and subtraction.</p>	
<p><b>Work with equal groups of objects to gain foundations for multiplication (2.OA.3-4)</b></p>		
<p><b>Standards:</b></p>	<p><b>I Can Statements:</b></p>	<p><b>Essential Elements:</b></p>
<p><b>OA.3</b> Determine whether a group of objects (up to 20) has an odd or even number of members, e.g. by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</p>	<p>I can count up by 2s orally and in writing starting with a variety of even numbers.</p> <p>I can identify 1-digit numbers as odd and even.</p> <p>I can write each even number up to 20 as the sum of two equal addends.</p> <p>I can determine if a group of up to 20 objects or a number less than 1000 is odd or even.</p>	<p><b>EE.2.OA.3.</b> Equally distribute even number of objects between two groups.</p>
<p><b>OA.4</b> Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.</p>	<p>I can represent multiplication problems by creating a model and write an addition number sentence to find the total.</p>	<p><b>EE.2.OA.4.</b> Use addition to find the total number of objects arranged within equal groups up to a total of 10.</p>
<p><b>Number &amp; Operations in Base Ten (NBT)</b></p>		

Understand place value (2.NBT.1-4)		
Standards:	I Can Statements:	Essential Elements:
<p><b>NBT.1</b> Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:</p> <p>a. 100 can be thought of as a bundle of ten tens - called a "hundred".</p> <p>b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, nine hundreds (and 0 tens and 0 ones).</p>	<p>I can identify the value of digits to the thousands place.</p> <p>I can understand the three digits of a 3-digit number represent amounts and values of hundreds, tens, and ones.</p> <p>I can read, write, and model 2-digit or 3-digit numbers shown with base-10 blocks, including numbers with 0 as a place holder.</p>	<p><b>EE.2.NBT.1.</b> Represent numbers up to 30 with sets of tens and ones using objects in columns or arrays.</p>
<p><b>NTB.2</b> Count within 1000; skip-count by 5s, 10s, and 100s.</p>	<p>I can fill in missing numbers on a number line.</p> <p>I can make tally marks and give the total.</p> <p>I can count up by 5s, 10s orally and in writing, starting with a variety of numbers.</p> <p>I can skip count by 1s, 5s, 10s, and 100s up to 1,000.</p>	<p><b>EE.2.NBT.2.a.</b> Count from 1 to 30 (count with meaning; cardinality).</p> <p><b>EE.2.NBT.2.b.</b> Name the next number in a sequence between 1 and 10.</p>
<p><b>NBT.3</b> Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.</p>	<p>I can read, write, and model 2-digit or 3-digit numbers shown with base-10 blocks, including numbers with 0 as a place holder.</p>	<p><b>EE.2.NBT.3.</b> Identify numerals 1 to 30.</p>

	I can write numbers up to 1,000 in expanded form.	
<b>NBT. 4</b> Compare two three-digit numbers based on meaning of the hundreds, tens, and ones digits, using $>$ , $=$ , and $<$ symbols to record the results of comparisons.	I can order numbers or compare numbers less than 1,000 using $<$ , $>$ , $=$ symbols.	<b>EE.2.NBT.4.</b> Compare sets of objects and numbers using appropriate vocabulary (more, less, equal).
<b>Use place value understanding and properties of operations to add and subtract (2.NBT.5-9)</b>		
<b>Standards:</b>	<b>I Can Statements:</b>	<b>Essential Elements:</b>
<b>NBT. 5</b> Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	I can fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	<b>EE.2.NBT.5.a.</b> identify the meaning of the “+” sign (i.e., combine, plus, add), “-” sign (i.e., separate, subtract, take), and the “=” sign (equal). <b>EE.2.NBT.5.b.</b> Using concrete examples, compose and decompose numbers up to 10 in more than one way.
<b>NBT. 6</b> Add up to four two-digit numbers using strategies based on place value and properties of operations.	I can add three or four numbers by reordering the addends (the Associative Property).  I can add up to four 2-digit numbers based on place value strategies.	<b>EE.2.NBT.6-7.</b> Use objects, representations, and numbers (0-20) to add and subtract.
<b>NBT. 7</b> Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship	I can solve addition and subtraction problems within 1,000 using an open number line and/or computation strategy.	<b>EE.2.NBT.6-7.</b> Use objects, representations, and numbers (0-20) to add and subtract.

between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.		
<b>NBT. 8</b> Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.	I can mentally add and subtract 10 or 100 to/from 2-digit and 3-digit numbers (11 to 999).	<b>EE.2.NBT.8-9</b> *Not applicable.
<b>NBT. 9</b> Explain why addition and subtraction strategies work, using place value and the properties of operations. <i>*Explanations may be supported by drawings or objects.</i>	I can explain why addition/subtraction strategies work.  I can find the unknown operation.	<b>EE.2.NBT.8-9</b> *Not applicable.
<b>Measurement and Data (MD)</b>		
<b>Measure and estimate lengths in standard units (2.MD.1-4)</b>		
<b>Standards:</b>	<b>I Can Statements:</b>	<b>Essential Elements:</b>
<b>MD. 1</b> Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	I can measure an object to the nearest inch and to the nearest centimeter.  I can estimate a length and select the appropriate measuring tool in the US Customary System (inch, foot, yard) and Metric System (centimeter, meter).	<b>EE.2.MD.1.</b> Measure the length of objects using non-standard units.
<b>MD. 2</b> Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the	I can measure the same object using different units and describe how the measurements relate to the size of	<b>EE.2.MD.2.</b> *Not applicable.

two measurements relate to the size of the unit chosen.	the units.	
<b>MD. 3</b> Estimate lengths using units of inches, feet, centimeters, and meters.	I can estimate a length and select the appropriate measuring tool in the US Customary System (inch, foot, yard) and Metric System (centimeter, meter).	<b>EE.2.MD.3-4.</b> Order by length using non-standard units.
<b>MD. 4</b> Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	I can measure to find the difference in length of two objects.	<b>EE.2.MD.3-4.</b> Order by length using non-standard units.
<b>Relate addition and subtraction to length (2.MD.5-6)</b>		
<b>Standards:</b>	<b>I Can Statements:</b>	<b>Essential Elements:</b>
<b>MD. 5</b> Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	I can use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units using drawings and equations with a symbol for the unknown.	<b>EE.2.MD.5.</b> Increase or decrease length by adding or subtracting unit(s).
<b>MD. 6</b> Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0,1,2,...., and represent whole-number sums and differences within 100 on a number line diagram.	I can plot measurements on an open number line to solve addition and subtraction number stories and write the corresponding number model using a symbol for the unknown.	<b>EE.2.MD.6.</b> Use a number line to add one more unit of length.
<b>Work with time and money (2.MD.7-8)</b>		
<b>Standards:</b>	<b>I Can Statements:</b>	<b>Essential Elements:</b>

<p><b>MD. 7</b> Tell and write time from analog and digital clocks to the nearest five minutes, using <i>a.m.</i> and <i>p.m.</i></p>	<p>I can tell time to the nearest five minutes, record it in digital notation, and correctly indicate AM or PM.</p>	<p><b>EE.2.MD.7.</b> Identify on a digital clock the hour that matches a routine activity.</p>
<p><b>MD. 8</b> Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and symbols appropriately. <i>Example: If you have 2 dimes and 3 pennies, how many cents do you have?</i></p>	<p>I can count or draw a collection of coins to an identified value.</p> <p>I can calculate the value of coin and bill combinations using a cents symbol and dollar sign or draw a value using \$1, quarters, dimes, nickels, and pennies including those in number stories.</p> <p>I can make a reasonable estimate involving money in addition and subtraction word problems.</p> <p>I can make change from \$1.00. I can solve word problems involving dollar bills, quarters, dimes, nickels, and pennies.</p>	<p><b>EE.2.MD.8.</b> Recognize that money has value.</p>
<p><b>Represent and interpret data (2.MD.9-10)</b></p>		
<p><b>Standards:</b></p>	<p><b>I Can Statements:</b></p>	<p><b>Essential Elements:</b></p>
<p><b>MD.9</b> Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</p>	<p>I can create a line plot to represent a data set up to four categories and analyze/synthesize about the information displayed.</p>	<p><b>EE.2.MD.9-10.</b> Create picture graphs from collected measurement data.</p>

<p><b>MD.10</b> Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.</p>	<p>I can create a bar graph or pictograph to represent a data set up to four categories and analyze/synthesize about the information displayed.</p> <p>I can use the data to answer questions about a bar graph.</p>	<p><b>EE.2.MD.9-10.</b> Create picture graphs from collected measurement data.</p>
<p><b>Geometry (G)</b></p>		
<p><b>Reason with shapes and their attributes (2.G.1-3)</b></p>		
<p><b>Standards:</b></p>	<p><b>I Can Statements:</b></p>	<p><b>Essential Elements:</b></p>
<p><b>G.1</b> Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. <i>*Sizes are compared directly or visually, not compared by measuring.</i></p>	<p>I can identify, draw, and describe 2-dimensional shapes based on their attributes.</p> <p>I can identify and describe 3-dimensional shapes based on their attributes.</p> <p>I can draw a line segment using a straightedge and identify parallel line segments.</p>	<p><b>EE.2.G.1.</b> Identify common two-dimensional shapes: square, circle, triangle, and rectangle.</p>
<p><b>G.2</b> Partition a rectangle into rows and columns of same-size squares, and count to find the total number of them.</p>	<p>I can divide shapes into equal parts.</p> <p>I can use fractions to describe the equal parts of a shape.</p>	<p><b>EE.2.G.2.</b> *Not applicable.</p>
<p><b>G.3</b> Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words <i>halves, thirds, half of, a third of, etc.</i>, and describe the whole as</p>	<p>I can identify or represent a fraction of a region.</p> <p>I can divide a circle or rectangle into 2,</p>	<p><b>EE.2.G.3.</b>*Not applicable. See <b>EE.4.G.3.</b> and <b>EE.4.NF.1-2</b></p>

<p><i>two halves, three thirds, four fourths.</i> Recognize that equal shares of identical wholes need not have the same shape.</p>	<p>3, or 4 equal parts and describe the whole in terms of the parts.</p> <p>I can demonstrate my understanding that equal sizes of the same whole may have different shapes.</p>	
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### Resources

**ALEKS** [aleks.com](http://aleks.com)

Assessment and LEarning in Knowledge Spaces is a web-based learning system. It uses adaptive questioning to quickly and accurately determine exactly what a student knows and doesn't know in a course. ALEKS then instructs the student on the topics that the student has demonstrated that they are ready to learn and reassesses the student on mastered topics throughout the course to ensure the topic concept is retained. All domains and standards are addressed through this online learning system. Use in Grades 3 - 5 as a supplemental resource tool. Used as an extension in 2nd grade for our Gifted and Talented students.

**Dreambox** [dreambox.com](http://dreambox.com)

Dreambox is an online learning system. It uses adaptive questioning to determine and deliver the right lesson at the right time to personalize to the individual student. All domains and standards are addressed through this online learning system. Use in Grades K-5 as an intervention or enrichment tool.

**Front Row** [frontrowed.com](http://frontrowed.com)

Front row is an online learning system. Through assessments, the learning system adapts to the individual learner by building off student strengths and addressing student growth areas. All domain and standards are addressed. Use in Grades K - 5 as a supplemental resource tool.

**Khan Academy** [khanacademy.org](http://khanacademy.org)

Khan Academy is an online learning resource. It offers practice exercises, instructional videos, and a personalized learning system. The math missions is adaptive to guide learners in their strengths and

learning gaps. All domains and standards are addressed through this online learning system. Use in Grades K-5 as a supplemental resource tool.

**TenMarks [tenmarks.com](http://tenmarks.com)**

TenMarks is an online learning system. It is a personalized self-paced system that offers customized assignments to meet students' needs towards mastery of the domains. All domains and standards are addressed through this online learning system. Use in Grades 1-5 as a supplemental resource tool.

**Xtra Math [xtramath.org](http://xtramath.org)**

Xtra Math is an online math fact fluency program that helps students master addition, subtraction, multiplication, and division facts. Two domains, Operations and Algebraic Thinking and Number and Operations in Base Ten, are addressed. Use in Grades 2-5 as a supplemental resource tool.

**Flash To Pass**

This is an app for basic math fact fluency practice in all four operations. It is designed for the iPhone and iPad. Two domains, Operations and Algebraic Thinking and Number and Operations in Base Ten, are addressed. Use in Grades 2-5 as a supplemental tool.

**Math Magician [mathmagician.com](http://mathmagician.com)**

This is a website for basic math fact fluency practice in all four operations. Two domains, Operations and Algebraic Thinking and Number and Operations in Base Ten, are addressed. Use in Grades 2-5 as a supplemental tool.

**Learn Zillion [learnzillion.com](http://learnzillion.com)**

This is another website that offers instructional videos through a personalized learning system. The math mission is to improve instruction and respond to the specific needs of students.

**Box of Facts**

Visual aids for introducing and developing the basic addition, subtraction, multiplication, and division number facts and number-facts-strategies. Can be used with "The Book of Facts" series.

**Kathy Richardson**

The *Developing Number Concepts* series by Kathy Richardson is a complete K-2 curriculum for number operations that was designed to help young children develop important foundational mathematics concepts.

Each of the three books in the series includes cohesive and organized sets of activities and lessons focused on particular mathematical ideas. Every concept is developed both through teacher-directed and independent activities. Because children learn at different rates and come to school with varying levels of mathematical understanding the activities are “expandable” and, therefore, make it easy for teachers to differentiate their instruction.

### **James Burnett - Fundamental Games**

The games encourage students to develop their own mental computation strategies while providing enjoyable experiences in learning 'visible' mathematics. They also encourage the use of mathematical language and increase social interaction. Each book contains reproducible game boards and materials, and clear instructions on how to play and 'bring out' the mathematics.

### **Marcy Cook Math Tile Cards**

Math task cards that include algebraic thinking, reasoning, use of manipulatives, problem solving, differentiating to meet the needs of all students, mental math, cooperative math experiences and challenging students to think.

### **Everyday Math Resources**

*Everyday Mathematics* is a comprehensive Pre-K through Grade 6 mathematics program engineered for the Common Core State Standards. Developed by The University of Chicago, School Mathematics Project, the *Everyday Mathematics* spiral curriculum continually reinforces abstract math concepts through concrete real-world applications.