



# K – 6 Math Curriculum

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STCHARLESR6

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# K-6 Math Curriculum

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## **District Mission**

The City of St. Charles School District will REACH, TEACH, and EMPOWER all students by providing a challenging, diverse, and innovative education.

## **District Vision**

The City of St. Charles School District will be an educational leader recognized for high performance and academic excellence that prepares students to succeed in an ever-changing global society.

## **District Values**

We, the City of St. Charles School District community of students, parents, staff, and patrons, value:

- High quality education for all students which includes:
  - Lifelong learning from early childhood through adult education
  - Rigorous learning experiences that challenge all students
  - Instruction that meets the needs of a diverse community
  - Respect for all
  - Real world, critical thinking and problem-solving skills to prepare students for the 21<sup>st</sup> Century
  - Developing caring, productive, and responsible citizens
  - Strong engagement of family and community
  - A safe, secure, and nurturing school environment
  
- Achievement through:
  - Celebration of individual success
  - Collaboration with parents and community stakeholders
  - Exploration, Innovation, and creativity
  
- High quality staff by:
  - Hiring and retaining highly qualified and invested employees
  - Providing professional development and collaboration focused on increasing student achievement
  - Empowering staff to use innovative resources and practices
  
- Informed decisions that are:
  - Student-centered
  - Focused on student achievement
  - Data Driven
  - Considerate of all points of view
  - Fiscally responsible

# District Goals

For planning purposes, five overarching goals have been developed. These goals are statements of the key functions of the school district.

1. Student Performance
  - Develop and enhance the quality educational/instructional programs to improve student performance and enable students to meet their personal, academic, and career goals.
2. Highly qualified staff
  - Recruit, attract, develop, and retain highly qualified staff to carry out the District's mission, vision, goals, and objectives.
3. Facilities, Support, and Instructional Resource
  - Provide and maintain appropriate instructional resources, support services, and functional and safe facilities.
4. Parent and Community Involvement
  - Promote, facilitate and enhance parent, student, and community involvement in district educational programs.
5. Governance
  - Govern the district in an efficient and effective manner providing leadership and representation to benefit the students, staff, and patrons of the district.

# School District Philosophical Foundations

Teachers in the School District of the City of St. Charles share in and ascribe to a philosophy that places children at the heart of the educational process. We feel that it is our professional responsibility to strive to be our best at all times and to maximize our efforts by ensuring that the following factors are present in our classrooms and our schools.

1. Learning is developed within the personal, physical, social, and intellectual contexts of the learner.
2. A strong educational program should provide developmental continuity.
3. The successful learner is motivated, strategic, knowledgeable, and interactive.
4. Children learn best when they have real purposes and can make connections to real life.
5. Effective learning is a combination of student exploration and teacher and mentor modeling.
6. Assessment is an ongoing and multidimensional process that is an integral part of instruction.
7. Making reading and writing connections across multiple sources and curricula facilitates meaning.
8. Literacy for the future means literacy in multiple technologies.
9. Education must respond to society's diverse population and serve all children.
10. Interactions among students, teachers, parents, and community form the network that supports learning.

## **K-6 Math Philosophy**

It is the philosophy of the City of St. Charles School District that our K-6 students will have access to a rigorous mathematics curriculum that will prepare them for success in an ever changing global society. This curriculum will include strong number sense as a foundation, as well as 21st century skills. Our students will learn to use mathematical reasoning and critical thinking to problem solve and communicate. All students will develop a strong mathematical voice where they will be able to transfer and discuss their foundational skills to problem solving skills. Our students will have access to a solid remediation plan, engaging technology components, and plentiful enrichment opportunities that provide relevant, real-world application.

It is also the philosophy of the City of St. Charles School District that our K-6 mathematics educators will be supported through professional development, meaningful feedback and opportunities for collaboration. City of St. Charles School District educators will maintain accountability for holding high expectations for all students and preparing them for success in an ever changing global society, as well as trusted to always do what is best for students. Through the PLC process, City of St. Charles School District educators will develop purposeful lessons that build toward standards mastery and create and use meaningful formative assessments that drive instructional decisions, student goals, and curriculum revision.

## **K-6 Math Course Description**

The City of St. Charles School District's K- 6 mathematics courses were developed from extensive research done by the curriculum committee. The courses are built around best practices on teaching and learning mathematics that are research based and fully vetted. The research of NCTM (National Council for Teachers of Mathematics), Jo Boaler, Sherry Perrish, Carol Dweck, Susan O'Connell, and Graham Fletcher have sculpted these courses. Based on this new learning, we have developed K-6 mathematics courses that challenge students to think deeply and to persevere through tough problems. It teaches students to find their mathematical voice so they can explain their thinking, as well as construct viable arguments. It provides opportunities for students to collaborate to solve problems, share solutions, and generalize results. Each course was developed using the newly revised Missouri Learning Standards and the Standards of Mathematical Practices as their backbone. Students will delve into topics to build content mastery and efficiency in skills of number sense, number sense and operations in base ten, number sense and operations in fractions, relationships and algebraic thinking, geometry, measurement, data and statistics, probability, ratios and proportional relationships, and expressions, equations, and inequalities. From kindergarten through sixth grade, students will develop an extensive understanding of concepts by moving from the use of concrete to pictorial to abstract representations using the Math in Focus text series. Building strong number sense is at the heart of this mathematics program. The K-6 mathematics curriculum effectively prepares students of all ages and abilities with the skills necessary to think critically, communicate effectively and accomplish real-world tasks.



## **K-6 Math Rationale**

Because mathematics is the cornerstone of many disciplines, a comprehensive K-6 math curriculum should include applications to everyday life and model activities that demonstrate the connections among disciplines. Excellent mathematics instruction allows students to explore, inquire, question, manipulate, draw, and talk. Mathematics learning should focus on developing conceptual understanding through hands on learning, problem solving, reasoning and discourse. An effective mathematics teacher provides students with appropriate challenges and encourages perseverance, while supporting productive struggle in learning mathematics. These opportunities will build more than just a strong mathematical thinker. Learning mathematical ideas should be explored in ways that stimulate curiosity, create enjoyment of mathematics, and develop depth of understanding. Students need to understand mathematics deeply to use it effectively. Students should be actively engaged in doing meaningful mathematics, discussing mathematical ideas, and applying mathematics in interesting, thought-provoking situations. An effective mathematics program is based on a carefully designed set of content standards that are clear and specific, focused, and articulated over time as a coherent sequence. This curriculum is based on the newly revised Missouri Learning Standards. The sequence of topics and performances are based on what is known about how students' mathematical knowledge, skill, and understanding develop over time. What and how students are taught should reflect not only the topics within mathematics but also the key ideas that determine how knowledge is organized and generated within mathematics. All students should have a high quality mathematics program that prepares them for real world application. To promote achievement of these standards, teachers should encourage classroom talk, reflection, use of multiple problem solving strategies, and a positive disposition toward mathematics. They should have high expectations for all students. The reason we teach math is based on the belief that every child can learn at high levels.

## **K-6 Math Program Goals**

The overarching K-6 math program goal is that all students in the City of St. Charles School District deserve high quality mathematics instruction. The K-6 mathematics program starts with a strong and viable curriculum that develops along learning progressions and makes connections among mathematical skills and concepts and between other subject area, as well as provides real-world connections through literature, STEM activities, career connections, and performance based tasks. This mathematics program requires that all students have equal access to high-quality, rigorous mathematics instruction which includes effective teaching and learning practices, high expectations, and the support and resources needed to fully maximize each student's individual learning potential. This mathematics programs ensures that assessment is an integral part of the instruction and is used as a tool that informs feedback to students and drives instructional decisions. This mathematics program integrates the use of mathematical tools and technology as essential resources that help all students learn at high levels and assists them in making sense of mathematical ideas. With this mathematics program, educators must hold themselves and their colleagues accountable for the mathematical success of all learners and for their personal and collective growth as professionals. Together, we will move towards effective teaching and best practices and high levels of mathematics learning for all students. This program requires excellent teaching that is engaging and rigorous that provides opportunities for students to engage in meaningful learning tasks, individually as well as collaboratively, that promotes their ability to make sense of mathematical ideas and to be able to reason mathematically.

# K-6 Math Essential Learner Outcomes

## Kindergarten

In kindergarten, students will focus on two critical areas: (1) representing, relating, and operating with whole numbers; and (2) describing shapes. More teaching and learning will be devoted to building number sense than to other topics. Through whole group, small group, and individual instruction, students will achieve mathematical proficiency by counting, identifying, and representing numbers; exploring the relationship between numbers, quantities and cardinality; comparing numbers; understanding addition and subtraction; naming and composing simple shapes; and describing attributes of measurable objects as they appear in real world situations. Students will also use mathematical tools, manipulatives, and hands on experiences to increase their understanding of mathematical concepts. The essential learner outcomes for kindergarten are:

- Demonstrate that the last number name said tells the number of objects counted and the number of objects is the same regardless of their arrangement or the order in which they were counted (cardinality with conservation)
- Compare two numerals, between 1 and 10, and determine which is more than or less than the other
- Compose and decompose numbers from 11 to 19 into sets of tens with additional ones (using abstract representations/numbers)
- Demonstrate fluency for addition and subtraction within 5
- Make 10 for any number for 1 to 9
- Compare category counts using appropriate language (greater than, less than, equal to)
- Classify objects into student generated categories and count the number of objects in each category
- Compare the measurable attributes of two objects (length, height, weight, and capacity)
- Identify and describe the attribute of shapes and use the attributes to sort collections of shapes

## First Grade

In first grade, students will focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths; and (4) reasoning about attributes of, and composing and decomposing geometric shapes. Through whole group, small group, and individualized instruction, students will demonstrate mathematical proficiency. Students will make sense of problems, communicate reasoning, and support mathematical thinking in real world situations. First grade students will notice and apply patterns in counting, place value, and addition and subtraction. Students will also use mathematical tools, manipulatives, and hands on experiences to increase their understanding of mathematical concepts. The essential learner outcomes for first grade are:

- Add or subtract a multiple of 10 from another two-digit number, and justify the solution
- Use addition and subtraction within 20 to solve problems
- Determine the unknown whole number in an addition or subtraction equation relating three whole numbers
- Compose and decompose two and three dimensional shapes to build an understanding of part-whole relationships and the properties of the original and composite shapes
- Partition circles and rectangles into two or four equal shares, and describe the shares and the wholes verbally
- Demonstrate the ability to measure length or distance using objects
- Draw Conclusions from object graphs, picture graphs, T-Charts, and tallies

## Second Grade

In second grade, students will focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes in relationship to fractions. Through whole and small group experiences and individual instruction and practice, students will demonstrate mathematical proficiency by identifying and exploring measurement tools, constructing and interpreting number relationships, investigating and developing their foundational understanding of geometrical shapes. The essential learner outcomes for second grade are:

- Add or subtract within 1000 and justify the solution
- Add up to four two-digit numbers
- Read and write numbers within 1,000 using base ten numerals, number names, and expanded form
- Compare 2 three digit numbers based on the meanings of the hundreds, tens, and ones digits using  $<$ ,  $>$ , and  $=$
- Write and solve problems involving addition and subtraction within 100
- Demonstrate fluency with addition and subtraction within 100
- Find the total number of objects arranged in a rectangular array with up to 5 rows and 5 columns, and write an equation to represent the total as a sum of equal addends
- Partition circles and rectangles into two, three, and four equal shares, and describe the shares and the whole
- Estimate lengths using units of inches, feet, yards, centimeters and meters
- Measure to determine how much longer one object is than another
- Use addition and subtraction within 100 to solve problems involving lengths that are given in the same units
- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- Find the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using \$ and ¢ appropriately
- Draw conclusions from line plots, picture graphs and bar graphs
- Solve problems using information presented in line plots, picture graphs, and bar graphs

### Third Grade

In third grade, students will focus on four critical areas: (1) developing understanding of multiplication and division strategies for multiplication and division within 100; (2) developing understanding of fractions; (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two-dimensional shapes. Multiplication, division, and fractions are the most important developments in third grade. Through whole and small group experiences and individual instruction and practice, students will demonstrate mathematical proficiency by analyzing mathematical situations, planning a solution pathway, utilizing applicable tools, evaluating and explaining results, and applying concepts and skills to problems. The essential learner outcomes for third grade are:

- Use multiplication and division within 100 to solve problems.
- Determine the unknown number in a multiplication or division equation relating three whole numbers.
- Demonstrate fluency with products within 100
- Write and solve two-step problems involving variables using any of the four operations.
- Explain why fraction comparisons are only valid when the two fractions refer to the same whole.
- Compare two fractions with the same numerator or denominator using the symbol  $>$ ,  $<$ ,  $=$  and justify the solution.
- Recognize and generate equivalent fractions using visual models, and justify why the fractions are equivalent
- Estimate time intervals in minutes.
- Solve problems involving addition and subtraction of minutes.
- Multiply whole number side lengths to solve problems involving the area of rectangles.
- Decompose a rectangle into smaller rectangles to find the area of the original rectangle.
- Partition shapes into parts with equal areas, and express the area of each part as a unit fraction of the whole.
- Solve one- and two-step problems using information presented in bar and/or picture graphs.
- Use data shown in a line plot to answer questions.
- Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories

### Fourth Grade

In fourth grade, students will focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry. Through whole group, small group, and individual opportunities, students will demonstrate mathematical proficiency by exhibiting the ability to analyze mathematical situations to plan a solution pathway and apply concepts to problems. Students will use appropriate tools and models to justify, evaluate, and communicate results of their work and the work of others. The essential learner outcomes for fourth grade are:

- Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution
- Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, and justify the solution
- Explain and/or illustrate why two fractions are equivalent and justify the solution
- Solve problems involving adding and subtracting fractions and mixed numbers with like denominators.
- Decompose a fraction into a sum of fractions with the same denominator and record each decomposition with an equation and justification
- Solve problems involving multiplication of a fraction by a whole number.
- Compare two decimals to the hundredths place using the symbols  $>$ ,  $=$  or  $<$ , and justify the solution
- Multiply or divide to solve problems involving a multiplicative comparison.
- Solve multi-step whole number problems involving the four operations and variables and using estimation to interpret the reasonableness of the answer.
- Solve whole number division problems involving variables in which remainders need to be interpreted, and justify the solution.
- Draw and identify points, lines, line segments, rays, angles, perpendicular lines and parallel lines.
- Draw and measure angles in whole-number degrees using a protractor

### Fifth Grade

In fifth grade, students will focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases, (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume. Through whole group, small group, and individual opportunities, students will demonstrate mathematical proficiency by exhibiting the ability to analyze mathematical situations to plan a solution pathway, and apply concepts to problems. Students will use appropriate tools and models to justify, evaluate, and communicate results of their work and the work of other. The essential learner outcomes for fifth grade are:

- Use place value system understanding to perform operations with multi-digit and decimals to thousandths
- Understand that in a multi-digit number, a digit represents  $\frac{1}{10}$  times what it would represent in the place to its left
- Convert decimals to fractions and fractions to decimals
- Compare and order fractions and/or decimals to the thousandths place using symbols, less than, greater than and equal to, and justify solution
- Perform operations and solve problems with fractions and decimals
- Solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators and justify the solution.
- Estimate results of sums difference and products with fractions and decimals to the thousandths
- Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations
- Extend the concept of multiplication to multiply a fraction or whole number by a fraction
- Investigate the relationship between two numeric patterns
- Write a rule to describe or explain a given numeric pattern
- Translate written expressions into algebraic expressions
- Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals
- Create a line graph to represent a data set, and analyze the data to answer questions and solve problems
- Solve multi-step real-world problems involving measurement conversions within a given measurement system
- Convert decimal and fractional standard measurement units within a given measurement system
- Understand the concept of volume and recognize that volume is measured in cubic unit



## Sixth Grade

In Grade 6, instructional time should focus on four critical areas: (1) whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking. The essential learner outcomes for sixth grade are:

connecting ratio and rate t

- Extend prior knowledge to generate equivalent representations of rational numbers between fractions, decimals and percentages
- Find the greatest common factor (GCF) and the least common multiple (LCM)
- Write, interpret and explain problems of ordering of rational numbers
- Identify and generate equivalent algebraic expressions using mathematical properties
- Identify and describe relationships between two variables that change in relationship to one another
- Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation
- Recognize that inequalities may have infinitely many solutions and write and graph inequalities
- Analyze the relationship between the dependent and independent variables using graphs, tables and equations and relate these representations to each other
- Solve problems involving ratios, rates and percents
- Convert measurement units within and between two systems of measurement
- Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary from a single number
- Summarize numerical data sets in relation to the context including number of observations, quantitative measures, variability, and describing the overall pattern
- Describe the nature of the attribute under investigation including how it was measured and the units of measure
- Find the area of polygons by composing or decomposing the shapes into rectangles or triangles
- Solve problems using nets including finding surface area

## K-6 Math Scope & Sequence

I= Introduce R= Review E= Expand	<b>K</b>	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>	<b>5th</b>	<b>6th</b>
Number Sense To 120	I/R	R/E					
Number Sense Counting & Cardinality	I/R/E						
Number Sense Comparing Numbers	I/R/E						
Number Sense and Operations in Base Ten Place Value	I/R	I/R/E	I/R/E	I/R/E	R/E	R/E	E
Number Sense and Operations in Base Ten Place Value with Operations		I/R	R/E				E
Number Sense and Operations in Base Ten Problem Solving			I/R/E				E
Number Sense and Operations in Fractions				I/R	R/E	R/E	E
Number Sense and Operations in Fractions Fractions with Operations					I/R/E	R/E	E

<b>Number Sense and Operations in Fractions</b> Fractions and Decimals					I/R/E		E
<b>Relationships and Algebraic Thinking</b> Operations	I	I/R/E	I/R/E	I/R/E	I/R/E	I/R/E	I/R/E
<b>Relationships and Algebraic Thinking</b> Properties of Operations		I	I/R/E	I/R/E	I/R/E	I/R/E	I/R/E
<b>Relationships and Algebraic Thinking</b> Word Problems & Patterns				I/R/E			E
<b>Geometry &amp; Measurement</b> Shapes	I	I/R/E	I/R/E	I/R/E	I/R/E	I/R/E	I/R/E
<b>Geometry &amp; Measurement</b> Time & Money	I	R/E	I/R/E	I/R/E			
<b>Geometry &amp; Measurement</b> Length, Perimeter & Area		I	R/E	R/E	R/E		E
<b>Geometry &amp; Measurement</b> Weight & Volume				I/R/E		R/E	
<b>Geometry &amp; Measurement</b> Angles					I/R/E		
<b>Geometry &amp; Measurement</b> Coordinate Planes						I/R/E	

<b>Data &amp; Statistics</b> Data	I	I/R/E	I/R/E	I/R/E	R/E	R/E	
<b>Data &amp; Statistics</b> Analysis				I	I/R	I/R/E	I/R/E
<b>Ratios &amp; Proportional Relationships</b>							I/R

# **Kindergarten Math Curriculum**



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> Kindergarten</p> <p><b>CAREER CONNECTION:</b> teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker  <a href="http://Weusemath.org">Weusemath.org</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math In Practice Teaching Kindergarten Math</p> <p><b>LITERATURE CONNECTION:</b> <i>Mouse Count; Ten, Nine, Eight; The Doorbell Rang; Ten Black Dots; Chicka, Chicka, 1, 2, 3</i></p>	<p><b>TOPIC:</b> Number Sense</p> <p><b>DESCRIPTION:</b> Students will learn to deeply understand, write, and recognize numbers 0-20. Students will also understand that counting connects numbers and number words to particular quantities and objects. Students will match sets in a one-to-one correspondence to distinguish between equal to, more than, and less than. Students will learn that numbers follow a sequential order and be able to demonstrate the amount of objects in a group with a written numeral. This topic lays the foundation for counting objects using tens and ones, counting, reading and writing numerals to 120, and representing 1 - 120 objects with the correct number in first grade.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
K.NS.A.1 Count to 100 by ones and tens.	X	
K.NS.A.2 Count forward beginning from a given number between 1 and 20	X	
K.NS.A.3 Count backward from a given number between 10 and 1.	X	
K.NS.A.4 Read and write numerals and represent a number of objects from 0 to 20.	X	
K.NS.B.5 Say the number names when counting objects, in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	X	
K.NS.B.6 Demonstrate that the last number name said tells the number of objects counted and the number of objects is the same regardless of their arrangement or the order in which they were counted	X	
K.NS.B.7 Demonstrate that each successive number name refers to a quantity that is one larger than the previous number.	X	
K.NS.B.8 Recognize, without counting, the quantity of groups up to 5 objects arranged in common patterns.	X	
K.NS.B.9 Demonstrate that a number can be used to represent “how many” are in a set.	X	
K.NS.C.10 Compare two or more sets of objects and identify which set is equal to, more than or less than the other.	X	
K.NS.C.11 Compare two numerals, between 1 and 10, and determine which is more than or less than the other.	X	
Standards of Mathematical Practice Applied in this Topic		
<ul style="list-style-type: none"> <li>● Look for and make use of structure.</li> <li>● Model with mathematics.</li> <li>● Reason abstractly and quantitatively.</li> </ul>		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● There are many ways to represent a number.</li> <li>● We use numbers, including written numerals, to represent quantities or positions.</li> <li>● We use numbers to compare quantities.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● What do the names of numbers mean?</li> <li>● Why do we count?</li> <li>● How can we show numbers in different ways? (drawing, groups of objects etc.)</li> <li>● How can we compare sets of objects or numbers?</li> <li>● How can we order sets of objects or numbers?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>K.NS.A.1 Count to 100 by ones and tens  K.NS.A.2 Count forward beginning from a given number between 1 and 20  K.NS.A.3 Count backward from a given number between 10 and 1  K.NS.A.4 Read and write numerals and represent a number of objects from 0 to 20.</p>
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<p><b>LEARNING OBJECTIVE #1</b></p>	<ul style="list-style-type: none"> <li>● I can count to 100 by ones and tens</li> <li>● I can count forward from any number between 1 and 20</li> <li>● I can count backward from a given number between 10 and 1</li> <li>● I can read and write numerals from 0 to 20</li> <li>● I can write a numeral to go with a group of objects from 0 to 20</li> </ul>
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<p><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i></p>	<p><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p><b>I CAN?</b> <i>Skills, Products</i></p>
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<ul style="list-style-type: none"> <li>● Count</li> <li>● Tens</li> <li>● Ones</li> <li>● Hundred chart</li> <li>● Order</li> <li>● Pattern</li> <li>● Sequence</li> <li>● Forward</li> <li>● Count</li> <li>● Number</li> <li>● Increase</li> <li>● More</li> <li>● Backward</li> <li>● Decrease</li> <li>● Numeral</li> </ul>	<ul style="list-style-type: none"> <li>● Each number has a name</li> <li>● The next number said in a sequence is more</li> <li>● Counting can begin at any number</li> <li>● When counting forward numbers will increase</li> <li>● Counting can begin with any number</li> <li>● I know that when I count, every number I say is 1 more than the number before it</li> <li>● Counting decreases and begins with any number</li> <li>● Each number has a different name</li> <li>● Each number has a different symbol that represent it</li> <li>● A group of objects has a numeral that matches it</li> </ul>	<ul style="list-style-type: none"> <li>● I can count to 100 by ones and tens</li> <li>● I can count forward from any number between 1 and 20</li> <li>● I can count backward from a given number between 10 and 1</li> <li>● I can read and write numerals from 0 to 20</li> <li>● I can write a numeral to go with a group of objects from 0 to 20</li> </ul>
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<ul style="list-style-type: none"> <li>● Group</li> <li>● One, Two, Three (all numbers 0-20)</li> </ul>	<ul style="list-style-type: none"> <li>● The numbers 11-19 show 10 and some more</li> <li>● When counting every number, I say is 1 more than the number before it</li> </ul>	
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.NS.B.5 Say the number names when counting objects, in the standard order, pairing each object with one and only one number name and each number name with one and only one object. K.NS.B.6 Demonstrate that the last number name said tells the number of objects counted and the number of objects is the same regardless of their arrangement or the order in which they were counted. K.NS.B.7 Demonstrate that each successive number name refers to a quantity that is one larger than the previous number. K.NS.B.8 Recognize, without counting, the quantity of groups up to 5 objects arranged in common patterns. K.NS.B.9 Demonstrate that a number can be used to represent “how many” are in a set.
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<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can count objects one by one</li> <li>● I can understand that the last object counted tells the number of objects in the group</li> <li>● I can name a group of objects by using a number</li> <li>● I can understand that the number of objects in a group can be rearranged and the total number will be the same</li> <li>● I can count 20 or fewer objects no matter how they are arranged</li> <li>● I know that when I count every number I say is 1 more than the number before it</li> <li>● I can recognize groups of objects up to 5 without counting</li> <li>● I can show how many are in a group using a number</li> </ul>
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<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
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<ul style="list-style-type: none"> <li>● Numeral</li> <li>● Number</li> <li>● Group</li> <li>● One, Two, Three (all numbers 0-20)</li> <li>● Rearrange</li> <li>● Total</li> <li>● Arrangement</li> <li>● Collection</li> <li>● Counting numbers</li> <li>● Five frame</li> <li>● Number card</li> </ul>	<ul style="list-style-type: none"> <li>● Each object gets a name when counting</li> <li>● I know that when I count, every number I say is 1 more than the number before it</li> <li>● The last number said/counted is the amount in the group</li> <li>● Each group of objects has a number that goes with it</li> <li>● The number of objects in a group can be rearranged and the total will be the same</li> <li>● When counting the next number is one more</li> <li>● The amount of objects in a group up to 5 can be known through subitizing</li> </ul>	<ul style="list-style-type: none"> <li>● I can count objects one by one</li> <li>● I can understand that the last object counted tells the number of objects in the group</li> <li>● I can name a group of objects by using a number</li> <li>● I can understand that the number of objects in a group can be rearranged and the total number will be the same</li> <li>● I know that when I count, every number I say is 1 more than the number before it</li> <li>● I can recognize groups of objects up to</li> </ul>
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<ul style="list-style-type: none"> <li>• Number cubes</li> <li>• Set</li> <li>• Counting</li> <li>• Number cards</li> <li>• Number cubes</li> <li>• Counting order</li> </ul>	<ul style="list-style-type: none"> <li>• A number represents the amount in a group</li> </ul>	<p>5 without counting</p> <ul style="list-style-type: none"> <li>• I can show how many are in a group using a number</li> </ul>
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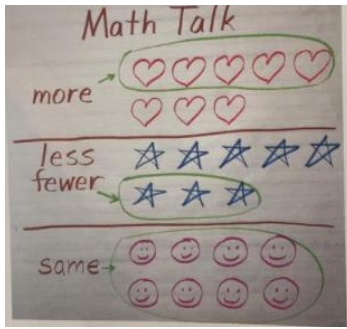
<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	<p>K.NS.C.10 Compare two or more sets of objects and identify which set is equal to, more than or less than the other.</p> <p>K.NS.C.11 Compare two numerals, between 1 and 10, and determine which is more than or less than the other.</p>	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can count to compare groups and find if they are equal to, more than, or less than</li> <li>• I can compare numerals and find if they are equal to, more than, or less than</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Equal to</li> <li>• More than</li> <li>• Less than</li> <li>• Compare</li> <li>• Counting</li> <li>• Numeral</li> <li>• Ten frame</li> </ul>	<ul style="list-style-type: none"> <li>• Counting helps us compare groups</li> <li>• Numerals help us compare groups</li> </ul>	<ul style="list-style-type: none"> <li>• I can count to compare groups and find if they are equal to, more than, or less than</li> <li>• I can compare numerals and find if they are equal to, more than, or less than</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Performance Task <a href="#">Mouse Count/ Caps for Sale</a> (count forward, write numbers, relationship between objects/quantities, count to answer how many, greater than less than, compare numbers)</li> <li>• Common assessments, observations and/or checklists</li> </ul>	<ul style="list-style-type: none"> <li>• Both</li> <li>• Both</li> </ul>	<ul style="list-style-type: none"> <li>• DOK 1-4</li> <li>• DOK 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use manipulatives and other visuals to model</li> <li>● Use subitizing cards</li> <li>● Model using rekenreks</li> <li>● Teacher use a number chart to 100 and model the patterns used to count by 1's and 10's. Ask: What do you notice as we count forward? What do you notice as we count backward? As we count from 20 to 30 and 30 to 40, etc., what patterns do you notice? How could we use these different patterns to help us count forward from any given number?</li> <li>● Use various visuals to help student build number concepts visually (subitizing). Hold a card up and ask students to explain how many objects they saw without having to touch and count. How do they know it is that number?</li> <li>● Teacher uses an anchor chart like below to lead a "Math Talk" ("Number Talk") to teach and represent the words more, less/fewer, and same when asking students to compare numbers. Have students turn and talk to share their ideas on this concept.</li> </ul>	<ul style="list-style-type: none"> <li>● Use pictorial representations to show understanding</li> <li>● Use rekenreks to solve problems</li> <li>● <a href="#">Counting Circles</a></li> <li>● <a href="#">The Napping House</a></li> <li>● <a href="#">Savvy Subitizing Cards from Build Math Minds</a></li> <li>● <a href="#">Guess the Marbles in the Bag</a></li> <li>● <a href="#">Biggest Number Wins</a></li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> </ul>



**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Teacher use a number chart to 0-20 or 0-10 or less depending on the student and manipulatives to model counting by ones. Practice with students clearly pronouncing the number names and counting orally. Ask: What do you notice as we count forward? What do you notice as we count backward? How could we use these different patterns to help us count forward from any given number?</li> <li>Use subitizing cards up to 5 to help struggling student build math concepts.</li> <li>Teacher builds 4 towers of linking cubes. One tower is made up of 2 cubes, then 3 cubes and so on through numbers 1-5 to show greater, less/fewer, equal. Teacher would model how to line up 2 towers to help child see the difference not only in number but in length.</li> </ul>	<ul style="list-style-type: none"> <li>Partner count: Pair student up with a partner and work together to count to a given number. Partner A says ONE, Partner B says TWO etc. while using manipulatives.</li> <li>Give students manipulatives to cover each object on the subitizing cards while counting aloud in correct order sequence.</li> <li>Teacher builds a tower of 4 using linking cubes. Students build a tower to match. Then students build a tower that is more, less, and equal to and compares each tower built to the tower of 4.</li> </ul>	<ul style="list-style-type: none"> <li>DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Teacher use a number chart to 100 and model the patterns used to count by 5's and 2's. What do you notice as we count forward? What do you notice as we count backward? How could we use these different patterns to help us count forward from any given number?</li> <li>Teacher choose a number like 35 and display it visually with 3 filled 10 frames and a ten frame that is only filled with 5 counters. Ask students how many objects do they see visually and encourage them to explain by counting by 10's and some ones instead of 1 to 1 counting.</li> <li>Teacher uses an anchor chart like below to lead a "Math Talk" ("Number Talk") to teach and represent the words more, less/fewer, and same when asking students to compare numbers. In addition the teacher uses examples that include the great than, less than, and equal to symbols. (ie <math>5 &gt; 3</math>, <math>3 &lt; 5</math>, <math>4 = 4</math>)</li> </ul>	<ul style="list-style-type: none"> <li>How many hands/how many fingers? Student sit in a circle and work together to count by fives. Student A hold up one hand and says "5", Student B holds up one hand and says "10" and so forth until all hands are up or you get to 100. Adapt the game to count by 2's by holding up 2 fingers.</li> <li><a href="#">Build a Number</a> Give student a larger number like 34. Using ten frames and manipulatives, ask students to construct that larger number.</li> <li>Have students create their own groups of items to demonstrate each vocabulary term (more, less/fewer, equal) and use symbols when describing their findings.</li> </ul>	<ul style="list-style-type: none"> <li>DOK 3-4</li> </ul>



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> Kindergarten</p> <p><b>CAREER CONNECTION:</b> teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math In Practice Teaching Kindergarten Math</p> <p><b>LITERATURE CONNECTION:</b> <i>Zero the Hero, A Place for Zero, What's the Place Value</i></p>	<p><b>TOPIC:</b> Number Sense &amp; Operations in Base Ten</p> <p><b>DESCRIPTION:</b> Students will learn that composing and decomposing numbers up to 19 is the foundation of place value. They will learn that counting can be more efficient when counting in groups rather than by ones. This topic lays the foundation for exploring concepts of place value with 2-digit numbers and composing and decomposing numbers to separate tens and ones in varied ways to add and subtract in first grade.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
K.NBT.A.1 Compose and Decompose numbers from 11 to 19 into sets of tens with additional ones.		X
Standards of Mathematical Practice Applied in this Topic		
<ul style="list-style-type: none"> <li>Look for and make use of structure.</li> <li>Model with mathematics.</li> <li>Reason abstractly and quantitatively.</li> </ul>		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>Numbers connect to a quantity.</li> <li>Using groups to count and combine is more efficient than counting by ones.</li> <li>The place value of teen numbers is made up of one group of ten and some number of ones.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>How do numbers connect to quantity?</li> <li>How can we organize a set of objects so they are easy to count and combine?</li> <li>How can we use tens and ones to make teen numbers?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>K.NBT.A.1 Compose and Decompose numbers from 11 to 19 into sets of tens with additional ones.</p>
<p><b>LEARNING OBJECTIVE #1</b></p>	<ul style="list-style-type: none"> <li>I can use objects, drawings or equations to show tens and ones.</li> <li>I can put together and take apart numbers from 11-19 by naming the tens and ones.</li> <li>I can work with numbers 0-19 to help me understand the place value of ones and tens.</li> </ul>

<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,            ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the            topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Count</li> <li>● Tens</li> <li>● Ones</li> <li>● Bundle</li> <li>● Compose</li> <li>● Decompose</li> <li>● Break apart</li> <li>● Combine</li> <li>● Join</li> <li>● Separate</li> <li>● Part</li> <li>● Whole</li> <li>● Part-part-whole</li> <li>● Number bond</li> <li>● Ten frame</li> </ul>	<ul style="list-style-type: none"> <li>● Groups of tens and ones can be shown through objects, drawing, and equations</li> <li>● Numbers can be shown in groups of tens and ones</li> <li>● Grouping numbers into ten is a more efficient way of counting</li> <li>● I know that number can be broken into parts</li> </ul>	<ul style="list-style-type: none"> <li>● I can use objects, drawings or equations to show tens and ones</li> <li>● I can put together and take apart numbers from 11-19 by naming the tens and ones</li> <li>● I can work with numbers 0-19 to help me understand the place value of ones and tens</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Performance Task- <a href="#">Teen Numbers with Tens Frames</a> (10 frames, 10 and some more)</li> <li>● Common assessments, observations and/or checklists</li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 2-3 (DOK 4 if student explains their thinking)</li> <li>● DOK 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

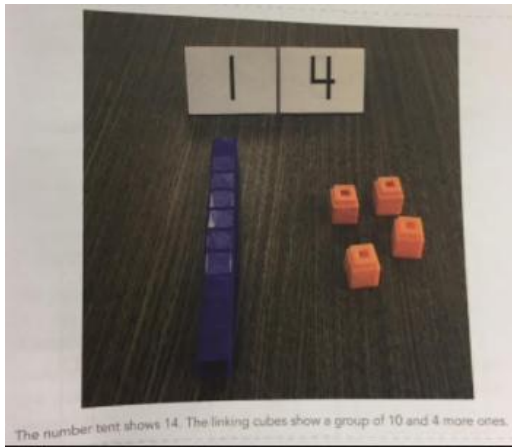
*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Use manipulatives and other visuals to model</li> <li>● Use subitizing cards</li> <li>● Model using rekenreks</li> <li>● Build a calendar routine for counting the days of school. It is important for students to see units of tens and ones in different ways. Using straws, add a straw for each day of the school year, bundling 10 straws as the year progresses. Also have a tally chart to mark each day of the school year. Finally have a chart with many ten frames to fill in dots for each day of the year. A daily routine is to count by tens and ones in many ways using the bundles of straws by tens, the tally chart, and the ten frames chart. This concept can also be used to build a number of the day like 14 using tally marks, ten frames and dominoes. See pictures below.</li> </ul>	<ul style="list-style-type: none"> <li>● Discuss and justify use of a specific strategy with a classmate</li> <li>● Use pictorial representations to show understanding</li> <li>● Use rekenreks to solve problems</li> <li>● <a href="#">What makes a teen number?</a> (rely more heavily on the manipulative aspect of this activity)</li> <li>● Students can play <a href="#">Ten Frame Mania</a> on the Greg Tang math website</li> <li>● 10 and Some More on a Ten Frame- students use counters to show numbers 11-19 on a double ten frame as 10 and more ones</li> <li>● Play the games for <a href="#">Making 20</a> using <a href="#">20 ten frame cards</a></li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> </ul>



- 10 and Some More on a Ten Frame-use counters to show numbers 11-19 on double ten frame as 10 and more ones. Ask why numbers bigger than 10 don't fit on one ten frame. Ask, "How many wouldn't fit? How many were left over? Do you think we will be able to fit this number on the ten frame?"
- Teacher models how to build teen number using linking cubes and [Math Tents](#). Using the math tents, model how the number 14 is 10 and 4 more. Then using linking cubes, model a stick of 10 linking cubes for the 1 in the tens place and 4 unconnected linking cubes as the 4 in the ones place.





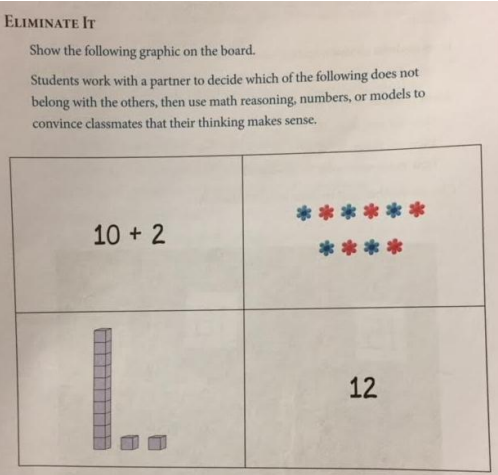
**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Read <u>20 Big Trucks in the Middle of the Street</u>. As a new truck is named, students place a counter on the double ten frame to count the trucks. Ask, “What do you notice about the number on the double ten frame? What number will come next?” After reading ask, “How many ten frames did we fill?”</li> <li>● Give each student two double tens frames. One of the double tens frames should be already filled in by the teacher. Show the students a number 11-19 and have them count on from 10 until they reach the desired number. As they count on they will place an object on on the second double tens frame for each new number said. When they are finished students will explain the number as 10 and ____ more ones. (ie for the number 12, they will count on from 10 to 12 and explain 12 as ten and two more)</li> <li>● Focus on numbers 5-10 using five frames and</li> </ul>	<ul style="list-style-type: none"> <li>● Read <u>20 Big Trucks in the Middle of the Street</u>. Students have their own double ten frame to add counters as each new truck is introduced. Ask, “What do you notice about the number on the double ten frame? What number will come next?” After reading ask, “How many ten frames did we fill?”</li> <li>● Students will be given a series of numbers from 11-19 and 2 double tens frames. One double tens frames will already have 10 counters affixed to it. The student will add more counters to the second double tens frame to make the number given true.</li> <li>● Adapt the games for <u>Making 20</u> into Making 5 and Making 10 (based on student’s needs) using <u>5 dot cards</u> and <u>10 dot cards</u>.</li> <li>● Give students two five frames. Make sure that one five frame is already filled. Give</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

<p>manipulatives. Show students various amounts from 5-10 on the five frames and pose questions. “How many objects are there?” “How did you count the objects?” “Could we count them in a different way?” “If we know that one five frame is full, how could we count on?”</p>	<p>students various numbers from 5-10 and ask them to fill the rest of their five frames to make their model match the number given.</p>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**  
*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Eliminate It- Show graphic on the board and have students work with a partner to decide which of the following does not belong with the others. Students will use math reasoning, numbers, or models to convince classmates that their thinking make sense.</li> </ul>  <ul style="list-style-type: none"> <li>Pose ten and some ones in an addition or subtraction problem. Use numbers sentences and have students use manipulatives to solve the numbers sentences (ie <math>10+4=?</math>, <math>19-9=?</math>, <math>10+?=14</math>, <math>19-?=10</math>, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Students will choose a number to work with from 11-19 and create their own Eliminate It to present to the class.</li> <li><a href="#">What Makes a Teen Number?</a> (rely more heavily on the number sense aspect in this activity)</li> <li><a href="#">11-19 Spinner</a>. Students use 11-19 spinner. Whatever number they land on students are to create a number sentence using 10 and some ones to equal the number they landed on</li> <li>Play the games for <a href="#">Making 20</a> using <a href="#">20 number cards</a>.</li> </ul>	<ul style="list-style-type: none"> <li>DOK 3-4</li> </ul>

- Use subitizing cards to show numbers 11-19. Write out a number sentence that shows how to add 10 and some more ones in order to equal the number shown on the subitizing cards. Have students talk with a partner about what parts the number sentence would need in order to make the whole.



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> Kindergarten</p> <p><b>CAREER CONNECTION:</b> teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math In Practice Teaching Kindergarten Math</p> <p><b>LITERATURE CONNECTION:</b> <i>The Action of Subtraction, The Mission of Addition, This Plus That, What's New at the Zoo?, Quack and Count, Pete the Cat Four Groovy Buttons</i></p>	<p><b>TOPIC:</b> Relationships and Algebraic Thinking</p> <p><b>DESCRIPTION:</b> Students will understand addition as putting together or adding to, and understand subtraction as taking apart or taking from. This topic lays the foundation for expanding understanding of addition by exploring problems with unknowns in various positions, comparison problems, and take apart/separate problems in first grade.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
K.RA.A.1 Represent Addition and Subtraction within 10	X	
K.RA.A.2 Demonstrates fluency for addition and subtraction within 5	X	
K.RA.A.3 Decompose numbers less than or equal to 10 in more than one way	X	
K.RA.A.4 Make 10 for any number from 1 to 9	X	
Standards of Mathematical Practice Applied in this Topic		
<ul style="list-style-type: none"> <li>● Make sense of problems and persevere in solving them</li> <li>● Reason abstractly and quantitatively</li> </ul>		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Numbers connect to a quantity.</li> <li>● Using groups to count and combine is more efficient than counting by ones.</li> <li>● The place value of teen numbers is made up of one group of ten and some number of ones.</li> <li>● Addition is putting together or adding to</li> <li>● Subtraction is taking apart or taking way</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How do numbers connect to quantity?</li> <li>● How can we organize a set of objects so they are easy to count and combine?</li> <li>● How can we use tens and ones to make teen numbers?</li> <li>● How can we show that we are putting numbers together to make more?</li> <li>● How can we show that we are taking numbers apart to make less?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.RA.A.1 Represent Addition and Subtraction within 10. K.RA.A.3 Decompose numbers less than or equal to 10 in more than one way.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can solve addition problems within 10 by acting out problem or using objects</li> <li>● I can solve addition problems within 10 by drawing pictures</li> <li>● I can write equations to show addition problems within 10</li> <li>● I can solve subtraction problems within 10 by acting out the problems or using objects</li> <li>● I can solve subtraction problems within 10 by drawing pictures</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b>  <i>Facts, Names, Dates, Places, Information,</i>  <b>ACADEMIC VOCABULARY</b></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b>  <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b>  <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Add</li> <li>● Add to</li> <li>● Equal (same as)</li> <li>● Equation</li> <li>● Number bond</li> <li>● Number sentence plus</li> <li>● Put together</li> <li>● Same as</li> <li>● Total</li> <li>● Minus</li> <li>● Separate</li> <li>● Subtract</li> <li>● Symbols (+, -, =)</li> <li>● Take apart</li> <li>● Take away</li> <li>● Take from</li> </ul>	<ul style="list-style-type: none"> <li>● Understand the operation of addition as putting together or adding to</li> <li>● Showing addition situation by acting out problem, using objects to model problems, or drawing pictures of problem situations</li> <li>● Recognizing and writing addition equations to represent problem situations</li> <li>● Understand the operation of subtraction as taking from or separating</li> <li>● Showing subtraction situations by acting out problems, using objects to model problems, or pictures of problem situations</li> <li>● Recognizing and writing subtraction equations to represent problem situations</li> </ul>	<ul style="list-style-type: none"> <li>● I can solve addition problems within 10 by acting out problem or using objects</li> <li>● I can solve addition problems within 10 by drawing pictures</li> <li>● I can write equations to show addition problems within 10</li> <li>● I can solve subtraction problems within 10 by acting out the problems or using objects</li> <li>● I can solve subtraction problems within 10 by drawing pictures</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.RA.A.2 Demonstrate fluency for addition and subtraction within 5.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can solve addition sentences by putting numbers together within 5</li> <li>● I can solve subtraction sentences by taking numbers apart within 5</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Add</li> <li>● Add to</li> <li>● Equal (same as)</li> <li>● Equation</li> <li>● Number bond</li> <li>● Number sentence</li> <li>● plus</li> <li>● Put together</li> <li>● Same as</li> <li>● Total</li> <li>● Minus</li> <li>● Separate</li> <li>● Subtract</li> <li>● Symbols ( +, -, = )</li> <li>● Take apart</li> <li>● Take away</li> <li>● Take from</li> </ul>	<ul style="list-style-type: none"> <li>● Understanding the operation of addition as putting together or adding to</li> <li>● Showing addition situations by acting out problems , using objects to model problems, or drawing pictures of problem situations</li> <li>● Recognizing and writing addition equations to represent problem situations</li> <li>● Understanding the operation of subtraction as taking from or separating</li> <li>● Showing subtraction situations by acting out problems, using objects to model problems, or drawing pictures of problem situations</li> <li>● Recognizing and writing subtraction equations to represent problem situations</li> </ul>	<ul style="list-style-type: none"> <li>● I can solve addition sentences by putting numbers together within 5</li> <li>● I can solve subtraction sentences by taking numbers apart within 5</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.RA.A.4 Make 10 for any number from 1 to 9.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can use addition or subtraction to find the missing part</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Add</li> <li>Add to</li> <li>Equal (same as)</li> <li>Equation</li> <li>Number bond</li> <li>Number sentence plus</li> <li>Put together</li> <li>Same as</li> <li>Total</li> <li>Minus</li> <li>Separate</li> <li>Subtract</li> <li>Symbols ( +, -,=)</li> <li>Take apart</li> <li>Take away</li> <li>Take from</li> </ul>	<ul style="list-style-type: none"> <li>When decomposing 10 students can find the missing number that makes 10 when given one part (<math>10=?+4</math>, <math>10=6+?</math>)</li> <li>Understanding the relationship between addition and subtraction when solving missing addends</li> <li>Use Number Bonds and part part whole boxes show students how addition and subtraction are related</li> </ul> <div style="text-align: center;"> <p>The diagram is titled "Number Bonds". It features a large rounded square on the left containing the number "10". To its right, two smaller rounded squares are connected to the "10" box by lines. The top square contains the number "5", and the bottom square is empty.</p> </div>	<ul style="list-style-type: none"> <li>I can use addition or subtraction to find the missing part</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Performance Task <a href="#">Sum of 5</a> (adding to 5 in different ways- could use actual dice as manipulatives)</li> <li>Common assessments, observations and/or checklists</li> </ul>	<ul style="list-style-type: none"> <li>Both</li> <li>Both</li> </ul>	<ul style="list-style-type: none"> <li>DOK 2-3 (DOK 4 if student explains their thinking)</li> <li>DOK 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use concrete, visual/pictorial, and abstract models to support and scaffold students' understanding of methods</li> <li>● Use subitizing cards</li> <li>● Use "Number Talks" to build number relationships to solve problems</li> <li>● Use manipulatives and other visuals to model</li> <li>● Model addition to 10 using number bonds by providing students with a number story</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate flexible use of strategies and method</li> <li>● Use manipulatives to show understanding</li> <li>● Use pictorial representations to show understanding</li> <li>● Use rekenreks to solve problems</li> <li>● <a href="#">Ten Frame Addition</a></li> <li>● <a href="#">What's Missing</a></li> <li>● <a href="#">My Book of Five</a></li> <li>● Use number bonds to show the parts and whole of a number story</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Model subitizing through number talks</li> <li>● Five Frame knowledge</li> <li>● Model cardinality when counting</li> <li>● Identifying the amount(concrete) with the number (abstract)</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate understanding of subitizing through number talk discussions</li> <li>● Count various amounts of objects up to 5 and match a number card to the amount of objects they counted</li> <li>● <a href="#">Dice Addition 1</a></li> <li>● <a href="#">Make 5 Dot Cards</a></li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Provide students with opportunities to use their own reasoning strategies and methods</li> </ul>	<ul style="list-style-type: none"> <li>● Reflect on which procedures seem to work best for specific types of problems</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



<p>for solving problems</p> <ul style="list-style-type: none"><li>● Ask students to discuss and explain the procedures they are using to solve problems</li><li>● Give students numbers above 10 to compose and decompose</li></ul>	<ul style="list-style-type: none"><li>● Decompose and compose numbers to separate tens and ones in varied ways (<math>12+7=10+2+7</math>)</li></ul>	
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**CONTENT AREA:** Mathematics

**COURSE:** Kindergarten

**TOPIC:** Geometry and Measurement

**CAREER CONNECTION:** teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker, architect, artist, meteorologist

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus (Singapore Math) & Math In Practice Teaching Kindergarten Math

**LITERATURE CONNECTION:** *The Wing on A Flea: A Book About Shapes*; *Round is a Mooncake: A Book of Shapes*; *Mouse Shapes*; *When a Line Bends, A Shape Begins*

**DESCRIPTION:** Students will be able to reason with shapes and their attributes; analyze squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres; and work with time and money. This topic lays the foundation for building shapes based on attributes, combining 2D or 3D shapes to form composite shapes, and refining understanding of geometric vocabulary terms in first grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
K.GM.A.1 Describe several measurable attributes of objects		X
K.GM.A.2 Compare the measurable attributes of two objects		X
K.GM.C.6 Identify shapes and describe objects in the environments using names of shapes, recognizing the names stays the same regardless of the orientations		X
K.GM.C. 7 Describe the relative position of objects in space		X
K.GM.C.8 Identify and describe the attributes of shapes, and use the attributes to sort a collection of shapes		X
K.GM.C.9 Draw or model simple two-dimensional shapes		X
K.GM.C.10 Compose simple shapes to form larger shapes using manipulatives		X
K.GM.B.3 Demonstrate an understanding of concepts of time and devices that measure time		X
K.GM.B.4 Name the days of the week		X
K.GM.B.5 Identify pennies, nickels, dimes, and quarters		X

**Standards of Mathematical Practice Applied in this Topic**

- Look for and make use of structure
- Attend to precision
- Use appropriate tools strategically

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Geometry and spatial sense offer ways to interpret and reflect on our physical environment.</li> <li>● Analyzing geometric relationships develops reasoning and justification skills.</li> <li>● Using specific words can help us describe and compare objects by their length, weight, capacity and attributes.</li> <li>● All objects have a shape with a specific name.</li> <li>● Time can be measured on a clock</li> <li>● There are 7 days in a week and these days help us keep track of time.</li> <li>● Specific coins each have a unique value.</li> <li>● Money amounts can be counted in different ways.</li> <li>● Different combinations of coins can make the same amounts.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How do words help us describe the location or position of a shape/figure?</li> <li>● How can we decide what name we call a shape/figure?</li> <li>● How can we describe/compare measurable attributes of objects?(length, weight, capacity,)</li> <li>● What are the different shapes in our world?</li> <li>● How can I measure the passage of time?</li> <li>● How does a calendar help me understand time?</li> <li>● How is each coin counted?</li> <li>● What is the easiest way to count a group of coins?</li> <li>● Is there more than one way to make the same amount of money?</li> </ul>
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<b>REFERENCES/STANDARDS</b>	K.GM.A.1 Describe several measurable attributes of objects.	
Missouri Learning Standards	K.GM.A.2 Compare the measurable attributes of two objects.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can describe attributes of objects</li> <li>● I can compare attributes of two objects</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Length</li> <li>● Height</li> <li>● Weight</li> <li>● More</li> <li>● Less</li> <li>● Tall/Taller</li> <li>● Short/Shorter</li> <li>● Light/Lighter</li> <li>● Heavy/Heavier</li> <li>● Long /Longer</li> </ul>	<ul style="list-style-type: none"> <li>● Attributes of an object help me compare objects (ie length, height, weight)</li> </ul>	<ul style="list-style-type: none"> <li>● I can describe attributes of objects</li> <li>● I can compare attributes of two objects</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.GM.B.3 Demonstrate an understanding of concepts of time and devices that measure time. K.GM.B.4 Name the days of the week.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I understand that there are many ways to measure time</li> <li>● I can name the days of the week</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b></p> <p style="text-align: center;"><i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b></p> <p style="text-align: center;"><i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b></p> <p style="text-align: center;"><i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Calendar</li> <li>● Day</li> <li>● Week</li> <li>● Month</li> <li>● Year</li> <li>● Sunday</li> <li>● Monday</li> <li>● Tuesday</li> <li>● Wednesday</li> <li>● Thursday</li> <li>● Friday</li> <li>● Saturday</li> <li>● Months of the year (January- December)</li> <li>● Clock</li> <li>● Time</li> <li>● Hour</li> <li>● Minute</li> <li>● Morning</li> <li>● Afternoon</li> <li>● Night</li> <li>● Yesterday</li> <li>● Today</li> <li>● Tomorrow</li> </ul>	<ul style="list-style-type: none"> <li>● Understanding that time can be measured with a clock, days of the week, birthdays (years), etc.</li> <li>● Understanding that days of the week repeat, but the particular day does not</li> </ul>	<ul style="list-style-type: none"> <li>● I understand that there are many ways to measure time</li> <li>● I can name the days of the week</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.GM.B.5 Identify pennies, nickels, dimes, and quarters.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can identify a penny, a nickel, a dime and a quarter</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Money</li> <li>Coin</li> <li>Penny</li> <li>Nickel</li> <li>Dime</li> <li>Quarter</li> </ul>	<ul style="list-style-type: none"> <li>Understanding that money has a value and can be used to make purchases</li> <li>Understanding that I can relate counting by 1's, 5's, and 10's to money</li> </ul>	<ul style="list-style-type: none"> <li>I can identify a penny, a nickel, a dime and a quarter</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	K.GM.C.6 Identify shapes(2D) and describe objects(3D) in the environments using names of figures, recognizing the names stays the same regardless of the orientations. K.GM.C. 7 Describe the relative position of figures in space. K.GM.C.8 Identify and describe the attributes of figures, and use the attributes to sort a collection of figures. K.GM.C.9 Draw or model simple two-dimensional shapes. K.GM.C.10 Compose simple shapes to form larger shapes using manipulatives.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can name and tell about flat shapes and solid objects</li> <li>I can describe the position of a figure</li> <li>I can name and describe the attributes of figures (2D &amp; 3D)</li> <li>I can sort figures by their attributes</li> <li>I can draw or model flat shapes</li> <li>I can use and put together two-dimensional shapes to make larger shapes</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Shape</li> <li>Figure</li> <li>Object</li> <li>Circle</li> </ul>	<ul style="list-style-type: none"> <li>Attributes define and determine the figures name</li> <li>When identifying and naming figures, the figures name remains the same regardless</li> </ul>	<ul style="list-style-type: none"> <li>I can name and tell about flat shapes and solid objects</li> <li>I can describe the position of an object</li> <li>I can name and describe the attributes of figures</li> </ul>

<ul style="list-style-type: none"> <li>● Triangle</li> <li>● Square</li> <li>● Rectangle</li> <li>● Hexagon</li> <li>● Cube</li> <li>● Cone</li> <li>● Cylinder</li> <li>● Sphere</li> <li>● Attribute</li> <li>● Face</li> <li>● Flat</li> <li>● Solid</li> <li>● Side</li> <li>● Corner</li> <li>● Vertices</li> <li>● Curved</li> <li>● Edge</li> <li>● Round</li> <li>● Above</li> <li>● Behind</li> <li>● Below</li> <li>● Beside</li> <li>● Next to</li> <li>● In front of</li> </ul>	<p>of the orientation</p> <ul style="list-style-type: none"> <li>● Understanding that words like above. Below, next to, in front of, and behind show position</li> <li>● Students will be able to distinguish between types of figures like flat and solid (2D and 3D)</li> <li>● Smaller shapes can be used to form larger shapes</li> </ul>	<ul style="list-style-type: none"> <li>● I can sort figures by their attributes</li> <li>● I can draw or model flat shapes</li> <li>● I can use and put together two-dimensional shapes to make larger shapes</li> </ul>
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**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Performance Task <a href="#">Surrounded and Covered</a> (measuring a patio and manipulating pieces to make a new patio using squares and rectangles)</li> <li>● Common assessments, observations and/or checklists</li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> <li>● DOK 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use manipulatives and other visuals to model</li> <li>● Introduce a balance scale to model to students how to make comparison about weight.</li> <li>● Show students how to match up endpoints when comparing object lengths</li> <li>● Establish a daily calendar routine</li> <li>● Connect daily counting routine to the concept of coins. Example: “This is a penny. It is worth ONE cent, when we count pennies we count by one.” “This is a dime. It is worth TEN cents, when we count dimes we count by ten.” “This is a nickel. It is worth five cents, when we count nickels we count by five.”</li> <li>● Introduce ways to identify shapes based on their attributes through hands-on explorations, sorting activities, and discussions</li> </ul>	<ul style="list-style-type: none"> <li>● Use manipulatives to show understanding</li> <li>● <a href="#">Which weighs more? Which weighs less?</a></li> <li>● <a href="#">Longer or Shorter</a></li> <li>● Students participate and talk about days of the week during daily calendar routine</li> <li>● Students use the coins pennies, nickels and dimes as way to practice counting by 1’s, 10’s and 5’s</li> <li>● <a href="#">Alike and Different Game</a></li> <li>● Students participate in and find ways to sort shapes based on their attributes</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● Reflect on misunderstandings</li> <li>● Work through difficult problems, with the understanding that breakthroughs often emerge from confusion and struggle</li> <li>● Role play different ways of saying, “This is tough and I don’t know how to proceed, but I will not give up!”</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"><li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems</li><li>● Ask questions that require explanation and justification</li></ul>	<ul style="list-style-type: none"><li>● Draw shapes from riddles</li><li>● Build figures of famous landmark buildings</li></ul>	<ul style="list-style-type: none"><li>● DOK 3-4</li></ul>





<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> Kindergarten</p> <p><b>CAREER CONNECTION:</b> teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math In Practice Teaching Kindergarten Math</p> <p><b>LITERATURE CONNECTION:</b> <i>Balancing Act, Just a Little Bit, The Button Box, Sort It Out, Grandma's Button Box</i></p>	<p><b>TOPIC:</b> Data and Statistics</p> <p><b>DESCRIPTION:</b> Students will classify objects and count the numbers of objects in each category. Categories can be given or student generated. Students will verbally defend or justify how the objects were classified. This topic lays the foundation for using sorting to organize data and representing the number of objects in a category in first grade.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
K.DS.A.1 Classify objects into given categories; count the number of objects in each category	X	
K.DS.A.2 Compare category counts using appropriate language	X	
Standards of Mathematical Practice Applied in this Topic		
<ul style="list-style-type: none"> <li>● Reason abstractly and quantitatively</li> <li>● Model with mathematics</li> </ul>		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● The way that data is collected, organized and displayed influences interpretation.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● What is data and why do we collect it?</li> <li>● How can we sort/organize the data to make it easy to understand?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>K.DS.A.1 Classify objects into given categories; count the number of objects in each category. K.DS.A.2 Compare category counts using appropriate language.</p>
<p><b>LEARNING OBJECTIVE #1</b></p>	<ul style="list-style-type: none"> <li>● I can sort objects into groups</li> <li>● I can explain how objects were grouped</li> <li>● I can count the object in each group</li> <li>● I can compare how many are in each group</li> </ul>

<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Sort</li> <li>● Groups</li> <li>● Categories</li> <li>● Least</li> <li>● Greatest</li> <li>● Rule</li> <li>● Compare</li> <li>● Equal to</li> <li>● More than</li> <li>● Less than</li> </ul>	<ul style="list-style-type: none"> <li>● Understanding that objects can be sorted into different categories to help us see the different kinds and amounts of items</li> <li>● Understand that objects can be grouped in many different ways, which can affect the counts in each category</li> <li>● Understand that after objects are sorted and counted, they can be compared to gain more information</li> </ul>	<ul style="list-style-type: none"> <li>● I can sort objects into groups</li> <li>● I can explain how objects were grouped</li> <li>● I can count the objects in each group</li> <li>● I can compare how many are in each group</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="#">Emoji Sort</a> (after students sort emoji have them count, write the number for each count, and compare the counts. Then they can sort in different ways and compare counts again)</li> <li>● Common assessments, observations and/or checklists</li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> <li>● DOK 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use concrete, visual/pictorial, and abstract models to support and scaffold students' understanding of methods</li> <li>● Give students different rules to sort by and have them sort their manipulatives into</li> </ul>	<ul style="list-style-type: none"> <li>● Use manipulatives to show understanding</li> <li>● Students sort objects how they are like or different based on a rule and explain their rule to peers</li> <li>● Listen to, comment on and question peers</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> </ul>

<p>groups. Then have them count the amount in each group and compare the groups. Do this in various ways so they can produce groups that have more than, less than, and equal to</p> <ul style="list-style-type: none"> <li>● Model sorting by sorting small groups of students at the beginning or end of lessons. Sort students based on color of shirt, eye, hair, etc.</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Sort and Count I</a></li> <li>● <a href="#">Sort and Count II</a></li> <li>● <a href="#">Goodie Bags</a></li> </ul>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Students sort objects based on a specific rule by color</li> <li>● Model tagging (matching and object to an object to show one to one correspondence) hand over hand</li> <li>● Explicitly teach vocabulary needed to help students understanding of categories like color, shape, size etc.</li> </ul>	<ul style="list-style-type: none"> <li>● Students sort by color and counting the items in a group</li> <li>● Students use tagging (matching and object to an object to show one to one correspondence) hand over hand</li> <li>● Student use appropriate vocabulary to demonstrate understanding of categories like color, shape, size etc.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Ask questions that require explanation and justification</li> <li>● Have a student create a survey to give to their classmates</li> <li>● Demonstrate flexible use of strategies and method</li> </ul>	<ul style="list-style-type: none"> <li>● Students sort objects based on a rule. Partners can guess what rule was used to sort the objects</li> <li>● Students will discover how changing the rule of the category changes the number in that category</li> <li>● Reflect on and justify reasoning, not simply providing an answer</li> <li>● Students use sorting to organize data; representing the number of objects or votes in a category by using tally marks</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>

## **First Grade Curriculum**



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> 1st Grade</p> <p><b>CAREER CONNECTION:</b> teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math in Practice Teaching First Grade Math</p> <p><b>LITERATURE CONNECTION:</b></p> <ul style="list-style-type: none"> <li>● <i>From One to One Hundred</i> by Teri Sloat</li> <li>● <i>The 100th Day of School</i> by Angela Shelf Medearis</li> <li>● <i>The King’s Commissioners</i> by Aileen Freidman</li> <li>● <i>One Hundred Hungry Ants</i> by Elinor J. Pinczes</li> <li>● <i>The Wolf’s Chicken Stew</i> by Keiko Kasza</li> </ul>	<p><b>TOPIC:</b> Number Sense</p> <p><b>DESCRIPTION:</b> In this topic, students understand how to use numbers between 0 - 120. Students think flexibly about numbers and their values by skip counting, counting up and back, identifying and writing numerals, and representing a number by producing a set. This topic builds on the kindergarten skill of number sense. It lays the conceptual foundation for first grade place value understanding and the second grade progression of understanding numbers through 1,000 and 3-digit place value.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
1.NS.A.1 Count to 120, starting at any number less than 120.	x	
1.NS.A.2 Read and write numerals and represent a number of objects with a written numeral.	x	
1.NS.A.3 Count backward from a given number between 20 and 1.	x	
1.NS.A.4 Count by 5s to 100 starting at any multiple of five.	x	
Standards of Mathematical Practice Applied in this Topic		
<ol style="list-style-type: none"> <li>1. Reason abstractly and quantitatively.</li> <li>2. Look for and make use of structure.</li> </ol>		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Patterns exist within counting.</li> <li>● Numbers represent values.</li> <li>● Skip counting is an efficient method to count.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● What ways can you count within 120?</li> <li>● How do you decide which counting method is most efficient?</li> <li>● What ways can you represent objects?</li> <li>● What patterns do you notice when counting numbers within 120?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.NS.A.1 Count to 120, starting at any number less than 120. 1.NS.A.3 Count backward from a given number between 20 and 1. 1.NS.A.4 Count by 5s to 100 starting at any multiple of five.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can count to 120, starting at any number less than 120 and use the strategy of counting by tens.</li> <li>● I can count backward within 20 to 0 and identify the next number in a backward sequence.</li> <li>● I can skip count by 5s within 0 to 100.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Counting on, counting up, 1 more, 1 less, skip count, counting back, before, after, pattern, greater, fewer, larger, smaller, number grid, number line, ten frame, multiple</li> </ul>	<ul style="list-style-type: none"> <li>● Patterns can be found in numbers</li> <li>● Numbers represent values</li> <li>● There are multiple ways to count</li> <li>● Skip counting is an efficient way of counting</li> </ul>	<ul style="list-style-type: none"> <li>● Count to 120 from a given number</li> <li>● Skip count by fives and tens</li> <li>● Count backward within 20</li> <li>● Name 1 more/1 less and 10 more/10 less from a given number within 120</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.NS.A.2 Read and write numerals and represent a number of objects with a written numeral.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can verbally identify, produce a set, and write a numeral to represent the quantity of objects in a set of 0-120.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Ten frame, number bond, subitize, represent, five group, group/set, numeral</li> </ul>	<ul style="list-style-type: none"> <li>● Numbers represent values</li> <li>● Numbers have names</li> <li>● Numbers are represented by a numeral</li> </ul>	<ul style="list-style-type: none"> <li>● Identify numbers out of sequence</li> <li>● Write numerals between 0 - 120</li> <li>● Represent a number by producing a set</li> <li>● Write a numeral to represent a quantity</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b>                      Performance task or other evidence                      Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● <u>Feet Under the Table</u> (I can write a numeral to represent a quantity)</li> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● (Math in Practice Formative Assessment Module 8 p. 177) A teacher made a chart to show what happened when students built numbers using connecting cubes. Can you finish the last two rows of the chart?</li> <li>● (Math in Practice Formative Assessment Module 8 p. 180) Show 58 using base-ten blocks. How many tens and how many ones are in your model? Does that make sense? Explain.</li> <li>● (Math in Practice Formative Assessment Module 8 p. 181) A baker made 64 cupcakes. She put 10 cupcakes on each tray. How many leftover cupcakes did she have?</li> <li>● (Math in Practice Formative Assessment Module 8 p. 187) Given a 2-digit number, use tens and ones to make two different ways to show the number.</li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Both</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li> <li>● DOK Level is dependent on assessment given</li> <li>● DOK Level 3 with explanation</li> <li>● DOK Level 3 with explanation</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Show numbers by grouping connecting cubes into a ten and ones and drawing place-value charts (MIF)</li> <li>● Use place-value charts and connecting cubes to compare numbers to 120. (MIF)</li> <li>● <u>Counting within 120 with our Robot Friend</u></li> <li>● Students slap their knees or snap their</li> </ul>	<ul style="list-style-type: none"> <li>● Start with 10 counters. Add additional counters to count on from 10 to 20.</li> <li>● Use double ten frames to make a 10 then count on from there to 20.</li> <li>● Roll the Number Cube! Game (Math in Focus)</li> <li>● <u>Online Number Games to 20 &amp; 120</u></li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level: 1 (foundational skills for 1st grade)</li> <li>● DOK Level 2 if students are providing visuals or explaining their thinking</li> </ul>

<p>fingers to keep a rhythm and to supply movement while counting to 120. If students are focusing on 5's or 10's, they slap or snap on these numbers.</p> <ul style="list-style-type: none"> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Ask students to make math drawings to explain their thinking</li> <li>● Use subitizing cards</li> <li>● Model using rekenreks could work here</li> </ul>	<ul style="list-style-type: none"> <li>● Describe and justify understandings with drawings, diagrams, or other representations</li> <li>● Sketch diagrams</li> <li>● Use rekenreks to solve problems</li> <li>● Use manipulatives to show understanding</li> <li>● Use pictorial representations to show understanding</li> </ul>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● (Math in Practice, Module 8 p. 182) Use place value pictures to create a house, car, or robot then determine the value of your creation.</li> <li>● (Math in Practice, Module 8 p. 184) Building on a Hundred Chart</li> <li>● (Math in Practice, Module 8 p. 185) Number Webs</li> </ul>	<ul style="list-style-type: none"> <li>● Reflect on misunderstandings</li> <li>● Work through difficult problems, with the understanding that breakthroughs often emerge from confusion and struggle</li> <li>● Role play different ways of saying, "This is tough and I don't know how to proceed, but I will not give up!"</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level: 1 (foundational skills for 1st grade)</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*



TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems</li> <li>● Ask questions that require explanation and justification</li> <li>● (Math in Practice, Module 8 p. 187-188) Eliminate It-Decide which of the following does not belong with the others, then use math reasoning, numbers, or models to convince others that your thinking makes sense</li> <li>● (Math in Practice, Module 8 p 188) Talk About It/Write About It- Sue said that 4 tens and 2 ones is the same as 3 tens and 12 ones. Do you agree or disagree? Why or Why not?</li> <li>● (Math in Practice, Module 8 p. 188) Number Riddles- I have 13 ones and 3 tens. What number am I?</li> </ul>	<ul style="list-style-type: none"> <li>● Apply numbers to 20 by utilizing strategies to develop fact fluency to 10 then to 20</li> <li>● Apply numbers to 120 by utilizing place value strategies to add and subtract 10 more or 10 less starting at any number within 120.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels: 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 1st Grade

**TOPIC:** Numbers Sense and Operations in Base Ten

**CAREER CONNECTION:** teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus (Singapore Math) & Math in Practice Teaching First Grade Math

**LITERATURE CONNECTION:**

- *Pinkalicious and the Pink Drink* by Victoria Kann
- *A Fair Bear Share, Shark Swimathon* by Stuart J. Murphy
- *A Collection for Kate* by Barbara deRubertis
- *Mission Addition* by Loreen Leedy
- *The Smushy Bus* by Leslie Helakoski

**DESCRIPTION:** In this topic, students understand numbers and operations in base ten. Students use place value to compare, compose, and decompose two-digit numbers. In addition, students calculate 10 more and 10 less, add within 100, and subtract a multiple of 10 using their knowledge of place value. This topic builds on kindergarten concepts of composing and decomposing numbers to 19 and it lays the foundation for using place value to add and subtract within 1,000 in second grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
1.NBT.A.1 Understand that ten can be thought of as a bundle of ten ones- called a “ten.”	X	
1.NBT.A.2 Understand two digit numbers are composed of ten(s) and one(s).	X	
1.NBT.A.3 Compare 2 two-digit numbers using the symbols $>$ , $=$ , or $<$ .	X	
1.NBT.A.4 Count by tens to 120 starting at any number.	X	
1.NBT.B.5 Add within 100.	X	
1.NBT.B.6 Calculate 10 more or 10 less than a given number mentally without having to count.	X	
1.NBT.B.7 Add or subtract a multiple of 10 from another two-digit number, and justify the solution.	X	

**Standards of Mathematical Practice Applied in this Topic**

1. Model with mathematics.
2. Use appropriate tools strategically.

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Place value can be used to compare numbers.</li> <li>● Two-digit numbers represent amounts of tens and ones.</li> <li>● Two-digit numbers can be decomposed as groups of tens and a group of ones.</li> <li>● Place value can be used to add two-digit numbers using tens and ones.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● What are ways to compare numbers?</li> <li>● What are ways to use place value to compose and decompose numbers?</li> <li>● How does place value help you add two-digit numbers?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>1.NBT.A.1 Understand that ten can be thought of as a bundle of ten ones- called a “ten.” 1.NBT.A.2 Understand two digit numbers are composed of ten(s) and one(s). 1.NBT.A.4 Count by tens to 120 starting at any number.</p>	
<p><b>LEARNING OBJECTIVE #1</b></p>	<ul style="list-style-type: none"> <li>● I can bundle and unbundle ones and tens.</li> <li>● I can compose and decompose two-digit numbers using tens and ones.</li> <li>● I can use place value to count by tens from any number within 120.</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Ten, one, place value, bundle, 2-digit number, compose, decompose,</li> </ul>	<ul style="list-style-type: none"> <li>● Numbers have place value</li> <li>● Numbers can be composed and decomposed using place value</li> </ul>	<ul style="list-style-type: none"> <li>● Show and count groups of tens using manipulatives</li> <li>● Use tens and ones to make numbers in different ways</li> </ul>

<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>1.NBT.A.3 Compare 2 two-digit numbers using the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>.</p>	
<p><b>LEARNING OBJECTIVE #2</b></p>	<ul style="list-style-type: none"> <li>● I can compare two digit numbers using the value of tens and ones.</li> <li>● I can use place value to explain and record if numbers are less than, greater than or equal to each other.</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Compare, greater than (<math>&gt;</math>), less than (<math>&lt;</math>), equal, place value, tens place, ones place, place value chart</li> </ul>	<ul style="list-style-type: none"> <li>● Numbers can be compared using the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math>.</li> <li>● Place value can be used to compare numbers</li> </ul>	<ul style="list-style-type: none"> <li>● Use base ten blocks to compare 2 two-digit numbers</li> <li>● Compare two numbers using greater than, less than, or equal to symbols</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.NBT.B.5 Add within 100.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can use place value understanding to add within 100 without regrouping.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Model, math drawing, addition, subtraction</li> </ul>	<ul style="list-style-type: none"> <li>Place value can be used to add</li> <li>Two-digit numbers can be represented with concrete models, drawings, or symbols that connect to place value</li> </ul>	<ul style="list-style-type: none"> <li>Use place value to decompose two-digit numbers in order to add them as tens and ones.</li> <li>Use models, drawings, and/or symbols that connect to place value to add within 100</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.NBT.B.6 Calculate 10 more or 10 less than a given number mentally without having to count. 1.NBT.B.7 Add or subtract a multiple of 10 from another two-digit number, and justify the solution.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can use place value understanding to add or subtract a multiple of ten from another two-digit number and justify the solution.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Mental math, multiple, calculate, solution, justify</li> </ul>	<ul style="list-style-type: none"> <li>Place value can be used to add and/or subtract multiples of ten mentally.</li> <li>Concrete models, drawings, and/or symbols can be used to justify a solution.</li> </ul>	<ul style="list-style-type: none"> <li>Mentally add and subtract multiples of ten.</li> <li>Justify my answers when adding or subtracting a multiple of 10 within 100 using concrete models, drawings, and/or symbols.</li> <li>Solve for two-digit numbers by adding and subtracting tens from tens and ones from ones.</li> <li>Solve two-digit addition and subtraction problems using different strategies.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b>  <b>Performance task or other evidence</b>  <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>Ask students to choose a number in the top row of a hundred chart and count by tens 9 times, circling the numbers counted. Ask: What patterns do you notice in the numbers you circled? (I can justify my answers when adding a multiple of 10 within 100 using concrete models)</li> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>Students visualize the addition with base-ten blocks or number lines and use their place value understanding to find the sum. MIP chapter 2 pg. 56-57</li> </ul>	<ul style="list-style-type: none"> <li>Formative</li> <li>Both</li> <li>Formative</li> </ul>	<p>DOK 2</p> <p>DOK 1, 2, 3, 4</p> <p>DOK 3</p>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>Show 14 craft sticks. Put 10 craft sticks in a group apart from the others, using a rubber band or string. Introduce students to the concept of 1 ten and 4 ones with the help of a place value chart.</li> <li>Show the number 13 on the place-value chart. Guide students to relate the digits of the number to 1 ten and 3 ones. (This example can be used with any two digit number.) MIF pgs. 177-178</li> <li>Represent two-digit numbers in different ways using manipulatives. (Given 27 cubes, students could show 1 ten and 17 ones, 2 tens and 7 ones etc.)</li> </ul>	<ul style="list-style-type: none"> <li><u>Roll &amp; Build</u> (Compose and decompose two-digit numbers as 10s and 1s)</li> <li>Given straws, cubes or base-ten blocks, students bundle an amount into tens and ones and represent the number on a place-value chart.</li> <li>Given a 100 hundred chart and a starting number, students count by tens and color in each ten on the chart as they count.</li> <li>Show and count groups of ten using manipulatives.</li> <li>Partners choose a “starting” number and count together or alternate each ten counting until their chosen “end” number.</li> </ul>	<p>DOK Levels 2, 3</p> <p>DOK Level 2</p> <p>DOK Levels 2,3</p> <p>DOK Level 2</p> <p>DOK Levels 2,3</p> <p>DOK Levels 2,3</p>

<ul style="list-style-type: none"> <li>Propose the following questions to students. Use manipulatives and place-value charts to show understanding of tens and ones.             <ol style="list-style-type: none"> <li>Mike says the number 34 is the same as 3 tens and 4 ones. Maria says the number 34 is the same as 34 ones. Who is correct and why?</li> <li>David says the number 25 is the same as 1 ten and 15 ones. Jayden says the number 25 is the same as 2 tens and 5 ones. Who is correct and why?</li> </ol> </li> <li>Using a 100 chart, discuss the pattern students notice as they count by tens to 100. Then ask students to predict the next two tens when counting to 120.</li> <li>Show students two amounts of cubes using two different colors. Model “matching and comparing” those objects. MIF pgs. 13-15</li> <li>Introduce the terms greater than and less than by showing two amounts and having students match and compare the groups. (The red group is less than the blue group because there are 3 more cubes than the red.) MIF Pgs. 13-14</li> <li>Introduce the symbols <math>&lt;</math>, <math>&gt;</math>, and <math>=</math> to by comparing two amounts and describing them using them in sentences.</li> <li>Using 2 place-value charts and base-ten blocks, model how to compare two-digit numbers using place value. MIF pgs. 177-178 (Write 2, two-digit numbers on the place-value charts. Students represent those numbers on the place-value mats using base-ten blocks. Model how to compare ones and ones and tens and tens for various two-digit numbers.</li> <li>Show students two different problems <math>4 + 5</math> and <math>16 + 3</math>. Ask students if they can see the difference between the two problems and</li> </ul>	<ul style="list-style-type: none"> <li>Roll the Number Cube MIF page 174-175</li> <li><u>Comparing Numbers</u> (Compare two-digit numbers using the value of tens and ones)</li> <li><u>Ordering Numbers</u> (Compare and order two-digit numbers)</li> <li>Using a deck of cards and a whiteboard, partners take turns drawing two number cards and comparing the numbers by recording the correct symbol on the whiteboard and by reading the inequality correctly. (Students could also use manipulatives and give their partners two amounts to match, count and compare.) (A <u>Top-It</u> Recording sheet could be used in addition or replacement to the whiteboard.)</li> <li>Students draw 2 (0-20) number cards, write the numbers on their <u>place-value</u> mats and represent the numbers using base-ten blocks. Student record the correct inequality on a <u>recording sheet</u>.</li> <li>Solve various types if addition and subtraction problems using a 100 cart, base-ten blocks, place-value charts and drawings demonstrating their understanding of place-value.</li> </ul>	<p>DOK Level 3</p> <p>DOK Level 3</p> <p>DOK Level 2</p> <p>DOK Level 2</p> <p>DOK Level 2, 3, 4</p>
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<p>what the difference is. (The second involves a two-digit number.) Review place-value with students by decomposing 16 on a place-value chart showing 1 ten and 6 ones. Decompose the 16 from the number sentence into tens and ones and represent that using a number bond. Model how to add <math>6 + 3 = 9 + 10 = 19</math>. MIF pgs. 204-205</p> <ul style="list-style-type: none"> <li>Using a double place-value chart (two charts stacked vertically) and base-ten blocks decompose and represent two-digit numbers. Model how to add ones and ones and tens and tens for sums in the ones column less than or equal to 10. MIF Chapter 13 Lesson 1 pgs. 84-93</li> <li>Model how to use tallies and circles to represent tens and ones. (Tallies representing the tens and circles representing ones. The number of circles (ones) should line up next to a ten if there is one.) MIF Chapter 13 Lesson 1 pg. 84-93</li> <li><u>Using a 100 chart to add and subtract multiples of ten.</u></li> <li>Model how to use a place-value chart and base-ten blocks to add and subtract multiples of ten.</li> </ul>		
<b>HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?</b> <i>Possible Interventions or differentiation strategies</i>		
TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Review the understanding of tens and ones using manipulatives and show numbers represented on a place-value chart.</li> <li>While comparing two groups, use a 100 chart or number line to gain better idea of their value and a sense of its value.</li> </ul>	<ul style="list-style-type: none"> <li>Given an amount of straws (or cubes and make ten sticks) students physically bundle the amount of tens and complete a place-value chart to show tens and ones.</li> <li>Students will use place-value charts to solve addition and subtraction problems.</li> </ul>	<p>DOK Level 2</p> <p>DOK Level 1</p>

<ul style="list-style-type: none"> <li>● Model solving various addition and subtraction problems.</li> <li>● MIF Reteach and Extra Practice pages</li> </ul>	<ul style="list-style-type: none"> <li>● Use manipulatives and a 100 chart to practice adding groups of 10.</li> </ul>	DOK Level 2
<b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i>		
TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Provide students opportunities to work with larger numbers.</li> <li>● Ask questions that require explanation and justification</li> </ul>	<ul style="list-style-type: none"> <li>● Practice composing and decomposing large numbers by place value and value.</li> <li>● Add 3 addends using place value</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 3, 4</li> </ul>





**CONTENT AREA:** Mathematics

**COURSE:** 1st Grade

**TOPIC:** Relationships and Algebraic Thinking

**CAREER CONNECTION:**

Construction Worker, Accountant, Administrator, Architect

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus (Singapore Math) & Math in Practice Teaching First Grade Math

**LITERATURE CONNECTION:**

- *Animals on Board, Jack the Builder, Safari Park, Double the Ducks, or Ready, Set, Hop!* by Stuart J. Murphy
- *Rooster's Off to See the World* by Eric Carle
- *Fish Eyes* by Lois Ehlert
- *Frog and Toad Are Friends* by Arnold Lobel
- *Splash!* by Ann Jonas
- *Ten Sly Piranhas* by William Wise
- *Two of Everything* by Lily Toy Hong
- *Double Trouble in Walla Walla* by Andrew Clements
- *Ten Little Fish* by Audrey Wood
- *Ten Black Dots* by Donald Crews
- *Ten Pigs* by William Wise
- *Ten Apples Up on Top* by Theo LeSieg

**DESCRIPTION:** In this topic, students understand the relationship between addition and subtraction to solve problems within 20. Also, students solve word problems with an unknown number involving an addition and/or subtraction equation using 3 whole numbers. This topic builds on the kindergarten skill of understanding addition within 10 where the result was unknown and it lays the foundation for solving addition problems within 100 and beginning to explore two-step problems in second grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
1.RA.A.1 Use addition and subtraction within 20 to solve problems.	X	
1.RA.A.2 Solve problems that call for addition of three whole numbers whose sum is within 20.	X	
1.RA.A.3 Develop the meaning of the equal sign and determine if equations involving addition and subtraction are true or false.	X	
1.RA.A.4 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.	X	
1.RA.B.5 Use properties as strategies to add and subtract.	X	
1.RA.B.6 Demonstrate that subtraction can be solved as an unknown addend problem.	X	
1.RA.C.7 Add and subtract within 20.	X	

1.RA.C.8 Demonstrate fluency (**refers to accuracy and efficiency and does not equate to memorization) with addition and subtraction within 10.	X	
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**Standards of Mathematical Practice Applied in this Topic**

1. Make sense of problems and persevere in solving them.
2. Use appropriate tools strategically.

**ENDURING UNDERSTANDINGS:**

- Addition and subtraction reciprocate (go together)
- Addends can be manipulated in many ways without affecting the sum
- Multiple strategies can be used to solve addition and subtraction problems

**ESSENTIAL QUESTIONS:**

- How do addition and subtraction go together?
- Why can addends be manipulated in many ways without affecting the sum?
- What are efficient strategies and explain why you chose them?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.RA.A.1 Use addition and subtraction within 20 to solve problems. 1.RA.A.3 Develop the meaning of the equal sign and determine if equations involving addition and subtraction are true or false. 1.RA.B.5 Use properties as strategies to add and subtract. 1.RA.B.6 Demonstrate that subtraction can be solved as an unknown addend problem. 1.RA.C.7 Add and subtract within 20. 1.RA.C.8 Demonstrate fluency (**refers to accuracy and efficiency and does not equate to memorization) with addition and subtraction within 10.
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<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can use the relationship between addition and subtraction to solve problems within 20.</li> </ul>
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<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Add/ addition, subtract/ subtraction, equal sign, addends, sum, difference, properties (associative, commutative), equation, unknown whole number</li> </ul>	<ul style="list-style-type: none"> <li>● Addition and subtraction are related</li> <li>● Both sides of an equation are equal. (<math>9 = 5+4</math> and <math>5 + 4 = 9</math> or <math>5+4= 4+5</math>)</li> <li>● As I add the sum gets larger and as I subtract the difference gets smaller</li> <li>● Addends can be added in multiple ways without affecting the sum</li> <li>● Using the relationship between addition and subtraction, there are multiple strategies I can use to solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>● Use subtraction to solve an addition equation and use addition to solve a subtraction problem</li> <li>● Use different strategies to solve problems and state reasons why I chose to add or subtract a problem</li> <li>● Use fact families to solve addition and subtraction equations</li> <li>● Use models of subtraction to solve problems with unknown - addends (ex. fact families, number bonds)</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.RA.A.2 Solve problems that call for addition of three whole numbers whose sum is within 20. 1.RA.A.4 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can solve word problems with an unknown number using an addition and/or subtraction equation by relating 3 whole numbers.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Addends, sum, property (associative), unknown whole number</li> </ul>	<ul style="list-style-type: none"> <li>A symbol can represent an unknown number from word problems</li> <li>Objects, drawings and/or equations can be used to find the unknown number/amount</li> <li>Addends can be added in multiple ways and it will not affect the sum</li> </ul>	<ul style="list-style-type: none"> <li>Use a symbol to represent an unknown number from a word problem</li> <li>Solve word problems with addition of 3 whole numbers to 20</li> <li>Find the unknown number in an addition and subtraction equation by relating 3 whole numbers</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Pose a problem &amp; ask students to draw a diagram and write an equation to show how they would solve it. (Ex's: 1. Morgan had 6 dolls in her dollhouse. She put 5 more dolls in her dollhouse. How many dolls are in her dollhouse? 2. There were 7 birds in a tree. Some more birds landed in the tree. Now there are 13 birds in the tree. How many birds landed in the tree? 3. Jesse had some toy cars. He gave 3 toy cars to his brother. Jesse has 9 toy cars left. How many toy cars did Jesse have to start?)</li> <li>Focus on the Question Activity (Math In Practice Module 1, pg. 53)</li> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> </ul>	<ul style="list-style-type: none"> <li>Formative</li> <li>Summative</li> <li>Both</li> </ul>	<ul style="list-style-type: none"> <li>DOK Levels: 2, 3</li> <li>DOK Level: 4</li> <li>DOK Levels: 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Pose a problem &amp; discuss. (Ex's: 1. Sally said <math>1+4=5+3</math>. Sam says she is wrong. Who is correct? Use numbers, pictures and/or words to show your thinking. 2. Consider this problem: <math>3+7=10</math>. What does the equal sign mean? 3. There were 12 children on the swim team. Four of them were boys and some were girls. How many girls were on the swim team? 4. The zookeeper gave some bananas to the monkeys for lunch. The monkeys ate 7 bananas and the zookeeper counted 8 left. How many bananas did the zookeeper start with?)</li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections to the word problem (concrete, visual/pictorial, and abstract)</li> <li>● Model an addition/subtraction problem using rekenreks and discuss.</li> <li>● Pose an addition/subtraction problem. Ask students to solve, then make math drawings to explain their thinking.</li> </ul>	<ul style="list-style-type: none"> <li>● <u>Mouse Count</u> (I can find the unknown number in addition equations)</li> <li>● <u>How Many Are Hiding</u> (I can use subtraction to solve an addition equation and use addition to solve a subtraction problem)</li> <li>● <u>20 Tickets</u> OR <u>The Very Hungry Caterpillar</u> OR <u>Tic-Tac-Toe Sums</u> (I can use different strategies to solve problems and state reasons why I chose to add or subtract a problem)</li> <li>● <u>Cave Game Subtraction</u> (I can use models of subtraction to solve problems with unknown - addends)</li> <li>● <u>Fact Family Fun</u> (I can use fact families to solve addition and subtraction equations)</li> <li>● Use rekenreks to solve problems</li> <li>● Students sketch diagrams to show thinking</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li> <li>● DOK Level 3</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK level 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Act it Out (Math in Practice Module 1, page 22)- Pose problems and have students act out the problems by coming together or moving apart. Talk about the actions of each problem, then have students write an equation to show the problem.</li> <li>● Show It (Math in Practice Module 1, page 22)- Pose problems and have students use manipulatives to show what is happening in the problems.</li> <li>● Provide the word problem for each student to glue onto the paper and have them make a drawing to show each problem.</li> <li>● When solving a word problem, allow students to use concrete items that are literally “taken from” to help them visualize what is happening in the problem.</li> </ul>	<ul style="list-style-type: none"> <li>● Act it Out- students will act out an addition/subtraction problem. Then, talk about the actions of the problem before writing the equation to show the problem.</li> <li>● Show it- Students will use manipulatives to show a concrete representation and understanding of a problem.</li> <li>● Students will use a drawing to show a visual representation and understanding of a problem.</li> <li>● Students will use manipulatives to show a concrete representation and understanding of a problem. (Ex: rekenreks)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li>   <li>● DOK Level 1</li>   <li>● DOK Level 2</li>   <li>● DOK Level 1</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Exploring Unknowns in Different Positions (Math in Practice Module 1, page 24)- Teacher introduces problems with unknowns in different positions.</li> <li>● Sorting Subtraction Situations (Math in Practice Module 2, page 57)- Teacher provides word problems to be sorted into structures of “take from” and “compare”.</li> </ul>	<ul style="list-style-type: none"> <li>● Exploring Unknowns in Different Positions- students will explore how to solve addition and subtraction problems with unknowns in different positions.</li> <li>● Sorting Subtraction Situations- students will work together in pairs to sort word problems by structure. Students must decide on and justify the situation for that card.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li>   <li>● DOK Level 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 1st Grade

**TOPIC:** Geometry and Measurement

**CAREER CONNECTION:** teacher, baker, veterinarian, doctor, computer scientist, athlete, musician, construction worker

[Weusemath.org](http://www.xpmath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus (Singapore Math) & Math in Practice Teaching First Grade Math

**LITERATURE CONNECTION:**

- *Brown Rabbit's Shape Book* by Alan Baker
- *A Cloak for the Dreamer* by Aileen Friedman
- *Eating Fractions* by Bruce McMillan
- *Is the Blue Whale the Biggest Thing There Is?* By Robert E. Wells
- *What's Smaller Than a Pygmy Shrew?* By Robert E. Wells
- *What Time Is It, Mr. Crocodile?* By Judy Sierra
- *All in a Day* by Mitsumasa Anno
- *The Grouchy Ladybug* by Eric Carle
- *It's About Time, Max!* By Kitty Richards
- *Benny's Pennies* by Pat Brisson
- *Bunny Money* by Rosemary Wells
- *A Chair for My Mother* by Vera B. Williams
- *Monster Money* by Grace Maccarone
- *26 Letters and 99 Cents* by Tana Hoban
- *Circus Shapes, Let's Fly a Kite, Super Sand Castle Saturday, or Game Time!* by Stuart J. Murphy

**DESCRIPTION:** In this topic, students understand defining and non-defining attributes of 2- and 3- dimensional shapes, how to combine these shapes to form new ones, and how shapes can be partitioned. This topic builds on the kindergarten skill of identifying, naming, and creating 2- and 3- dimensional shapes. It lays the foundation for understanding quadrilaterals in second grade. Students also understand measurement with nonstandard units. This topic builds on the kindergarten skill of using measurable attributes to describe and compare objects. It lays the foundation for measuring objects to the nearest inch or centimeter in second grade. Students also understand how to tell and write time to the hour and half-hour using analog and digital clocks. It lays the foundation for telling time to the nearest 5 minutes using both analog and digital clocks and understanding the difference between a.m. and p.m. in second grade. Students also understand how to identify coins and their values. It lays the foundation for counting groups of unlike coins, showing money values with dollar and cent signs, and solving addition/subtraction problems with money in second grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
1.GM.A.1 Distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes.		X
1.GM.A.2 Compose and decompose two- and three- dimensional shapes to build an understanding of part-whole relationships and the properties of the original and composite shapes.		X
1. GM.A.3 Recognize two- and three- dimensional shapes from different perspectives and orientations.		X

1.GM.A.4 Partition circles and rectangles into two or four equal shares, and describe the shares and the wholes verbally.		X
1.GM.B.5 Order 3 or more objects by length.		X
1.GM.B.6 Compare lengths of two objects indirectly by using a third object.		X
1. GM.B.7 Demonstrate the ability to measure length or distance using objects.		X
1.GM.C.8 Tell and write time in hours and half-hours using analog and digital clocks.		X
1.GM.C.9 Know the value of a penny, nickel, dime and quarter.		X

**Standards of Mathematical Practice Applied in this Topic**

1. Model with mathematics.
2. Use appropriate tools strategically.
3. Attend to precision.

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Shapes have defining and non-defining attributes</li> <li>● Shapes can be two- or three- dimensional</li> <li>● Shapes can be made up of other shapes</li> <li>● Partitioning shapes from a whole makes them smaller</li> <li>● Objects can be measured and compared by their length</li> <li>● Non-standard units can be used to measure</li> <li>● Time is a standard of measurement</li> <li>● Coins have different values</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● What are ways to distinguish defining and non-defining attributes?</li> <li>● What makes a shape two-dimensional? Three-dimensional?</li> <li>● What are composite shapes?</li> <li>● Why does partitioning shapes makes them smaller?</li> <li>● How do I measure length accurately?</li> <li>● How can people measure the same object and get a different length?</li> <li>● How can I use a clock to measure time?</li> <li>● How can I differentiate between the different types of coins and their values?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.GM.A.1 Distinguish between defining attributes versus non-defining attributes; build and draw shapes that possess defining attributes. 1.GM.A.2 Compose and decompose two- and three- dimensional shapes to build an understanding of part-whole relationships and the properties of the original and composite shapes. 1. GM.A.3 Recognize two- and three- dimensional shapes from different perspectives and orientations.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can create and describe two-dimensional shapes by using defining and non-defining attributes.</li> <li>● I can use the part-whole relationship and properties to compose and decompose two- and three-dimensional shapes.</li> <li>● I can recognize two- and three- dimensional shapes from different perspectives and orientations.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Attribute, shape, two-dimensional, three-dimensional, part, whole, compose, decompose, properties, composite shape, perspective, orientation, angles, vertices,</li> </ul>	<ul style="list-style-type: none"> <li>● Shapes can be two-dimensional or three-dimensional</li> <li>● Shapes have attributes which can be defining or non-defining</li> <li>● Shapes can look different depending on your perspective and orientation</li> <li>● Shapes can be composed and decomposed demonstrating the part-whole relationship</li> </ul>	<ul style="list-style-type: none"> <li>● Identify and distinguish between defining and non-defining attributes</li> <li>● Build and draw shapes to show defining attributes</li> <li>● Describe the similarities and differences between 2 two-dimensional shapes</li> <li>● Compose and decompose two- and three-dimensional shapes explaining the part-whole relationship</li> <li>● Recognize two- and three- dimensional shapes from different perspectives and orientations</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.GM.A.4 Partition circles and rectangles into two or four equal shares, and describe the shares and the wholes verbally.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can partition circles and rectangles into halves and fourths and verbally describe those parts.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Partition, equal shares, halves, half of, fourths, fourth of, quarter of, quarters,</li> </ul>	<ul style="list-style-type: none"> <li>● Shapes can be partitioned to make equal shares</li> </ul>	<ul style="list-style-type: none"> <li>● Identify and partition shapes into halves and fourths in different ways</li> </ul>



rectangle, circle	<ul style="list-style-type: none"> <li>• The more times I partition a shape, the smaller the shares become</li> <li>• Fourths and quarters are the same</li> </ul>	<ul style="list-style-type: none"> <li>• Verbally describe a whole by talking about its parts halves, fourths, and quarters</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.GM.B.5 Order 3 or more objects by length. 1.GM.B.6 Compare lengths of two objects indirectly by using a third object. 1. GM.B.7 Demonstrate the ability to measure length or distance using objects.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>• I can explore linear measurements with non-standard units.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Length, distance, compare, short, shorter, shortest, long, longer, longest, same as, equal to, end-to-end, units</li> </ul>	<ul style="list-style-type: none"> <li>• Objects can be measured in different units</li> <li>• Objects can be compared using their length</li> <li>• Objects should be measured end to end</li> <li>• Measurement of an object differs when different-size units are lined up</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and order three objects by length</li> <li>• Compare the length of two objects based on a third object</li> <li>• Measure by lining up objects end to end and state it in units</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1.GM.C.8 Tell and write time in hours and half-hours using analog and digital clocks. 1.GM.C.9 Know the value of a penny, nickel, dime and quarter.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>• I can tell and write time to the hour and half-hour using digital and analog clocks.</li> <li>• I can identify coins and their values.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Analog, digital, clock face, hour, half-hour, hour hand, minute hand, time, value, penny, nickel, dime, quarter, cent</li> </ul>	<ul style="list-style-type: none"> <li>• Time can be measured by hours and minutes</li> <li>• The clock face displays time in hours and minutes</li> <li>• Coins have value</li> <li>• An hour is longer than a minute</li> </ul>	<ul style="list-style-type: none"> <li>• Use a digital and analog clock to tell and write the time to the hour and half-hour</li> <li>• Recognize coins</li> <li>• State the values of pennies, nickels, dimes, quarters</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b>  <b>Performance task or other evidence</b>  <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Performance Task <u>Between the Lines</u> (partitioning and composing 2D shapes)</li> <li>● Formative Assessment after the brownie sharing activity to demonstrate understanding of partitioning (Math in Practice Module 15, page 334)</li> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● Formative Assessment - ordering objects (Math in Practice Module 10, page 235)</li> <li>● Formative Assessment - Which is Longer? (Math in Practice Module 10, page 240)</li> <li>● Formative Assessment - Agree or Disagree? (Math in Practice Module 11, pages 254-255)</li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Formative</li> <li>● Both</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> <li>● DOK 3-4</li> <li>● DOK 1-4</li> <li>● DOK 3-4</li> <li>● DOK 3-4</li> <li>● DOK 3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Show It- Secret Sort (Math in Practice Module 14, page 306-308)</li> <li>● Use manipulatives and other visuals to model, for example build shapes on a geoboard and then model how to partition those shapes into halves and quarters.</li> <li>● Show It (Math in Practice Module 15, page 333)- Pose problem and record student discoveries on an anchor chart</li> <li>● Show It - Shorter and Longer (Math in Practice Module 10, page 234)</li> </ul>	<ul style="list-style-type: none"> <li>● Secret Sort follow up activity (Math in Practice Module 14, page 308)</li> <li>● <u>All Vs. Only Some</u> (Identify and distinguish between defining and non-defining attributes)</li> <li>● Show It (Math in Practice Module 15, page 333)- brownie sharing activity to practice partitioning</li> <li>● <u>Equal Shares</u> (Identify and partition shapes into halves and fourths in different ways)</li> <li>● <u>How Long?</u> (Measure length using objects)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 2-3</li> </ul>

<ul style="list-style-type: none"> <li>● Show It - Clock Face as a Number Line (Math in Practice Module 11, page 248)</li> <li>● Show It - Exploring the Hour Hand (Math in Practice Module 11, pages 249-251)</li> <li>● Introducing Half Hours Activity (Math in Practice Module 11, pages 252-253)</li> <li>● <u>What Time is it, Mr. Crocodile?</u> - book and activity (Math in Practice Module 11, page 261)</li> </ul>	<ul style="list-style-type: none"> <li>● <u>Measuring Blocks</u> (Measuring length using objects)</li> <li>● Eliminate It (Math in Practice Module 11, page 257)</li> <li>● Match Time (Math in Practice Module 11, page 257)</li> <li>● Students use the coins pennies, nickels and dimes as way to practice counting by 1's, 10's and 5's in games and daily calendar</li> </ul>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Model with manipulatives</li> <li>● Review prerequisite skills</li> <li>● Review vocabulary</li> <li>● Peer modeling</li> <li>● Show It- Sorting 2D shapes by varying attributes (Math in Practice Module 14, page 305)</li> <li>● Show It - Longer Than But Shorter Than (Math in Practice Module 10, page 236)</li> <li>● Show It - Comparing Measurement with Connecting Cubes (Math in Practice Module 10, page 238)</li> <li>● Show It - Digital and Analog: Predict and Check (Math in Practice Module 11, pages 259-261)</li> </ul>	<ul style="list-style-type: none"> <li>● Practice sorting shapes by attributes</li> <li>● Give a picture model to students that shows a rectangle, square, triangle, circle divided into 2 or 4 parts. Student will re-create partitioned shape on a geoboard and be able to describe its parts using math vocabulary.</li> <li>● Make a family flag with using 2 different colors of paper for students to demonstrate their understanding of halves. Hands on activity (Math in Practice Module 15, page 331-332)</li> <li>● Show It - Scooping Cubes (Math in Practice Module 10, page 235)</li> <li>● Show It - Short to Long (Math in Practice Module 10, page 237)</li> <li>● Time Tic-Tac-Toe (Math in Practice Module 11, page 263)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?***Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"><li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems</li><li>● Ask questions that require explanation and justification</li></ul>	<ul style="list-style-type: none"><li>● Show It- Compare shapes using Venn Diagrams (Math in Practice Module 14, page 310)</li><li>● Build shapes on a geoboard independently and partition those shapes into halves and quarters in multiple ways. Student will draw a representation naming the shape and labeling halves and quarters.</li><li>● Show It (Math in Practice Module 15, page 336-337) Sandwich Problem Solving</li><li>● Measurement Vocabulary Stories (Math in Practice Module 10, page 237)</li><li>● A Focus on Words (Math in Practice Module 10, page 237)</li><li>● Extension: Adding Minutes to the Clock Face (Math in Practice Module 11, page 259)</li><li>● Time Scavenger Hunt (Math in Practice Module 11, page 262)</li></ul>	<ul style="list-style-type: none"><li>● DOK 3-4</li></ul>



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> 1st Grade</p> <p><b>CAREER CONNECTION:</b> Meteorologist, statistician  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus (Singapore Math) &amp; Math in Practice Teaching First Grade Math</p> <p><b>LITERATURE CONNECTION:</b></p> <ul style="list-style-type: none"> <li>• <i>The Best Vacation Ever, The Sundae Scoop, or Tally O'Malley</i> by Stuart J. Murphy</li> <li>• <i>Duck! Rabbit!</i> By Amy Krouse Rosenthal</li> <li>• <i>Who's Got Spots?</i> By Linda W. Aber</li> </ul>	<p><b>TOPIC:</b> Data and Statistics</p> <p><b>DESCRIPTION:</b> In this topic, students understand how to use charts and graphs to organize and interpret data. This topic builds on the kindergarten skill of sorting objects into and naming categories and counting sorted objects. It lays the foundation for creating and interpreting charts and graphs in second grade.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
1. DS.A.1 Collect, organize, and represent data with up to three categories.		X
1. DS.A.2 Draw conclusions from object graphs, picture graphs, T-charts and tallies.		X
Standards of Mathematical Practice Applied in this Topic		
1. Construct viable arguments and critique the reasoning of others. 2. Reason abstractly and quantitatively.		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>• Data can be interpreted using graphs and charts to draw conclusions.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>• What ways can you organize data?</li> <li>• How can you interpret data?</li> <li>• How can you represent data in categories?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	1. DS.A.1 Collect, organize, and represent data with up to three categories. 1. DS.A.2 Draw conclusions from object graphs, picture graphs, T-charts and tallies.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can collect, organize, represent, interpret data and draw conclusions using picture graphs, object graphs, T-charts and tally charts.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Graphs, T-chart, pictograph, picture graph, tally, tally chart, data, data point, category, collect, organize, interpret, represent, compare, label, sort, survey, title</li> </ul>	<ul style="list-style-type: none"> <li>Data can be collected, organized, represented and interpreted using different graphs and charts.</li> <li>Conclusions can be drawn from graphs and charts</li> </ul>	<ul style="list-style-type: none"> <li>Collect, organize, represent and interpret data using different graphs and charts</li> <li>Draw conclusions about data from graphs and charts</li> <li>Ask and answer questions and tell about data on a chart</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Provide students with a collection of pattern blocks with different numbers of each shape. Have students sort the blocks by their shape. Ask: Which shape do you have the most of? Least of? How many more squares than trapezoids are there?</li> <li>Show students data on a chart. Ask comparison questions about the data.</li> <li>Provide a set of data and ask students to write and answer two questions about the data.</li> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> </ul>	<ul style="list-style-type: none"> <li>Both</li> <li>Both</li> <li>Summative</li> <li>Both</li> </ul>	<ul style="list-style-type: none"> <li>DOK Level: 3</li> <li>DOK Level: 3</li> <li>DOK Level: 4</li> <li>DOK Levels: 1-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• How could you sort a group of toys (stuffed animals, balls, and trains) and make a graph to show how many toys are in the different groups?</li> <li>• Think about a question you might ask your classmates to which there are three possible answers. Conduct a survey and then graph the results by using either a pictograph or a bar graph.</li> <li>• Pose different data. Ask: Should the class use a bar graph or a picture graph to show this data? Why?</li> <li>• Daily/Weekly Tally and Graph (Math in Practice, Module 13, page 295)- Students respond to a daily or weekly survey question using a tally to indicate their answer, and then discuss what the chart shows.</li> <li>• Ask questions about a chart or data that require explanation and justification</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Favorite Ice Cream Flavor</u> (Collect, organize, represent, and interpret data)</li> <li>• <u>Weather Graph Data</u> (Collect, organize, represent, and interpret data)</li> <li>• <u>Comparing Columns</u> (Ask and answer questions; tell about data on a chart)</li> <li>• Students seek to understand the strategies and approaches of peers by asking questions, trying their way, and describing their way</li> <li>• Students present and explain ideas about the survey question and data in pairs, small groups, or whole class</li> <li>• Reflect on and justify reasoning, not simply providing an answer</li> </ul>	<ul style="list-style-type: none"> <li>• DOK Level 2</li> <li>• DOK Level 2</li> <li>• DOK Level 3</li> <li>• DOK Level 4</li> <li>• DOK Level 3</li> <li>• DOK Level 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Predict &amp; Sort (Math In Practice, Module 13, page 289)- Have students predict prior to sorting to help build estimation skills.</li> <li>• Spin, Sort, &amp; Compare (Math in Practice, Module 13, page 290)- Students who need concrete support could spin and collect a color tile, then sort and count the number of each.</li> </ul>	<ul style="list-style-type: none"> <li>• Predict &amp; Sort (Math In Practice, Module 13, page 289)- Students sort pictures of foods into groups and discuss comparisons between the sorted categories.</li> <li>• Spin, Sort, &amp; Compare (Math in Practice, Module 13, page 290)- Pairs of students use a spinner to generate data, record results, and answer questions.</li> </ul>	<ul style="list-style-type: none"> <li>• DOK Level: 3</li> <li>• DOK Level: 2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"><li>You Write the Questions (Math in Practice, Module 13, page 299)- Provide students with data about favorite cupcake flavors on a chart. Have students come up with questions about the data.</li></ul>	<ul style="list-style-type: none"><li>Students will create questions about provided data.</li></ul>	<ul style="list-style-type: none"><li>DOK Level: 4</li></ul>



## **Second Grade Curriculum**



<p><b>CONTENT AREA:</b> Mathematics      <b>COURSE:</b> 2nd Grade</p> <p><b>CAREER CONNECTION:</b> Computer Programmer, Medical Assistant, Medical Scientist  <a href="http://www.xpmath.org">Weusemath.org</a>  <a href="http://www.xpmath.com/careers/math_topics.php">http://www.xpmath.com/careers/math_topics.php</a></p> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus Chapter 1-Numbers to 1,000; Math in Practice Teaching Second Grade math</p> <p><b>LITERATURE CONNECTION:</b> <i>Earth Day Hooray, Zero the Hero, Sir Cumference and All the King's Tens</i></p>	<p><b>TOPIC:</b> Number Sense and Operations in Base Ten (Understand Place Value of Three Digit Numbers)</p> <p><b>DESCRIPTION:</b> In this topic, students will learn to count and compare numbers to 1,000, compare the number of objects in a set, order three digit numbers, and identify number patterns. This topic builds on the first grade skill of place value of tens and ones and comparing two-two digit numbers. It lays the foundations for the third grade standard of understanding place value to one million.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.NBT.A.1 Understand three-digit numbers are composed of hundreds, tens and ones.	X	
2.NBT.A.2 Understand that 100 can be thought of as 10 tens – called a “hundred.”	X	
2.NBT.A.3 Count within 1000 by 1s, 10s, and 100s starting with any number.	X	
2.NBT.A.4 Read and write numbers to 1,000 using number names, base-ten numerals and expanded form.	X	
2.NBT.A.5 Compare two three digit numbers using the symbols $>$ , $=$ , or $<$	X	
Standards of Mathematical Practice Applied in this Unit		
1. Attend to precision 2. Look for and make use of structure		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● The digits within numbers have a place value.</li> <li>● Three-digit numbers represent hundreds, tens, and ones.</li> <li>● Numbers continue on in a pattern that you can use to help you count.</li> <li>● Numbers can be compared using <math>&gt;</math>, <math>=</math>, <math>&lt;</math>.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How do I find the value of a number?</li> <li>● How many hundreds, tens and ones are represented in a three digit number?</li> <li>● Why should I use place value units to continue counting patterns?</li> <li>● How can I compare two three digit numbers?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.NBT.A.1 Understand three-digit numbers are composed of hundreds, tens and ones. 2.NBT.A.2 Understand that 100 can be thought of as 10 tens – called a “hundred.”	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can understand that three-digit numbers are composed of hundreds, tens, and ones.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Hundreds, tens, ones, digit, compose, place value, place value chart, unit</li> </ul>	<ul style="list-style-type: none"> <li>Three digit numbers are composed of hundreds, tens, and ones</li> <li>10 ones are called 10</li> <li>10 tens are called a 100</li> </ul>	<ul style="list-style-type: none"> <li>I can understand three digit numbers are composed of hundreds, tens and ones.</li> <li>I can compose three digit numbers using place value units.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.NBT.A.3 Count within 1000 by 1s, 10s, and 100s starting with any number.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can mentally count by 1s, 10s, and 100s when starting at any number up to 1,000.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Thousand, hundreds, tens, ones, skip counting patterns, mentally counting,</li> </ul>	<ul style="list-style-type: none"> <li>There are patterns that I can use to mentally count by 1s, 10s and 100s.</li> </ul>	<ul style="list-style-type: none"> <li>I can skip count by 1s, 10s and 100s to count within 1,000 from a given number.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	2.NBT.A.4 Read and write numbers to 1,000 using number names, base-ten numerals and expanded form.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can read and write numbers in multiple ways up to 1,000.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Standard form, word form, expanded form, place value chart, hundreds, tens, ones</li> </ul>	<ul style="list-style-type: none"> <li>Three digit numbers can be read and written in multiple ways</li> </ul>	<ul style="list-style-type: none"> <li>I can read and write numbers in standard form up to 1,000.</li> <li>I can read and write numbers in word form up to 1,000.</li> <li>I can read and write numbers in expanded form up to 1,000.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	2.NBT.A.5 Compare two three digit numbers using the symbols $>$ , $=$ , or $<$ .	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can compare two numbers made up of three digit numbers using the symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Greater than, less than, equal to, compare, place value</li> </ul>	<ul style="list-style-type: none"> <li>Two-three digit numbers can be compared using symbols <math>&gt;</math>, <math>=</math>, <math>&lt;</math>.</li> </ul>	<ul style="list-style-type: none"> <li>I can use the symbol <math>&gt;</math> to compare two numbers with three digits.</li> <li>I can use the symbol <math>&lt;</math> to compare two numbers with three digits.</li> <li>I can use the symbol <math>=</math> to compare two numbers with three digits.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>Performance Task: <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/carol's%20numbers.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/carol's%20numbers.pdf</a> (Carl's Number)</li> </ul>	<ul style="list-style-type: none"> <li>Both</li> <li>Formative</li> </ul>	<ul style="list-style-type: none"> <li>DOK Levels 2-4 depending on the assessment given</li> <li>DOK 3, 4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li><i>Counting to 1,000 Using Tens and Hundreds-</i> Students will count up and down between ninety and one thousand by ones, tens and hundreds. Second Grade Math in Practice</li> </ul>	<ul style="list-style-type: none"> <li>Turn and Talk</li> <li>Number talks</li> <li>Using pictorial drawings to show answer</li> <li>Base ten blocks and place value charts</li> </ul>	<ul style="list-style-type: none"> <li>DOK 3</li> </ul>

<p>book page 92-93</p> <ul style="list-style-type: none"> <li>● Formative Assessment- Second Grade Math in Practice book page 103.</li> <li>● Expanded Form- Students use expanded form to compare numbers, emphasizing the importance of comparing hundreds to hundreds, tens to tens and ones to ones. Second Grade Math Practice Book page 123.</li> <li>● Extra practice worksheets in <i>Extra Practice</i> workbook pages 1-18.</li> <li>● Math in Focus Games- Chapter 1 in Student Book A <ul style="list-style-type: none"> <li>○ Lesson 2-Show the Number</li> <li>○ Lesson 3-Roll and Show</li> <li>○ Lesson 4 Roll and Count</li> </ul> </li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract).</li> <li>● Ask students to make math drawings to explain their thinking.</li> </ul>	<ul style="list-style-type: none"> <li>● Games</li> <li>● Extra Practice book (Math in Focus materials).</li> <li>● Demonstrate flexible use of strategies and method</li> </ul>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <i>Building Tens and Hundreds</i>- Students develop an understanding that 100 can be thought of as a bundle of 10 tens. Second Grade Math in Practice book page 88.</li> <li>● Roll it, Make it, Draw it- Students generate 3-digit numbers with 0-9 dice or 0-9 digit cards. Second Grade Math in Practice book page 98.</li> <li>● <i>More-Less 4 on a Board</i>- Students take turns generating 3-digit numbers with 0-9 dice or 0-9 digit cards, and then find 10 more/less or</li> </ul>	<ul style="list-style-type: none"> <li>● Using straws to bundle 10 ones into groups of ten</li> <li>● Using straws to bundles of ten to bundle into groups of 100.</li> <li>● Turn and Talk</li> <li>● Grand Conversation</li> <li>● Use manipulatives such as straws, popsicle sticks, linking cubes and place value mats to use a visual.</li> <li>● Math Games</li> <li>● Place value cards (allows students to build</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

<p>100 more/less. Second grade Math in Practice book page 99.</p> <ul style="list-style-type: none"> <li>● <i>Number Bonds to Show Expanded Form</i>- Second Grade Math Practice Book page 110.</li> <li>● Expanded Form- Students use expanded for to compare numbers, emphasizing the importance of comparing hundreds to hundreds, tens to tens and ones to ones. (Differentiate by using place value cards to build and expand the numbers). Page 123 of Second Grade Math Practice book.</li> <li>● Additional lessons in reteach book in Math in Focus (Chapter 1-Numbers to 1,000).</li> </ul>	<p>numbers and to expand numbers).</p> <ul style="list-style-type: none"> <li>● Count orally between two numbers (example: 5-68 or 478-500).</li> </ul>	
<p><b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i></p>		
TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Enrichment book from Math in Focus- Chapter 1-Numbers to 1,000 pages 1-10.</li> <li>● STEM Activity- Ocean World: Earth Globe Toss Game</li> <li>● <a href="https://www.jpl.nasa.gov/edu/teach/activity/ocean-world-earth-globe-toss-game/">https://www.jpl.nasa.gov/edu/teach/activity/ocean-world-earth-globe-toss-game/</a></li> </ul>	<ul style="list-style-type: none"> <li>● Extra practice sheets</li> <li>● Turn and Talk</li> <li>● Math conversations</li> <li>● Number talks</li> <li>● Problem Solving Tasks from Enrichment book</li> <li>● Explaining thinking to justify answer</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 2nd Grade

**CAREER CONNECTION:** Biostatistician, Chemist, Inventory Control Specialist

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Chapters 2 (addition), 3 (subtraction) and 4 (using Bar Models) in Math in Focus and Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:**

*A Fair Bear Share* by Stuart J. Murphy

**TOPIC:** Number Sense and Base Ten (Use place value understanding and properties of operations to add and subtract)

**DESCRIPTION:** Students will use place value understanding to add and subtract multi-digit numbers within 1,000. Students will use the relationship between addition and subtraction to solve problems and justify answers. Students will mentally add and subtract 10 and 100 to and from a number within 1,000. This topic builds on first grade concepts of using place value to add within 100 and it lays the foundation for third grade rounding and estimating to multi-digit numbers.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.NBT.B.1 Demonstrate fluency with addition and subtraction within 100.	X	
2.NBT.B.2 Add up to four two-digit numbers.	X	
2.NBT.B.3 Add or subtract within 1000, and justify the solution.	X	
2.NBT.B.4 Use the relationship between addition and subtraction to solve problems.	X	
2.NBT.B.5 Add or subtract mentally 10 or 100 to or from a given number within 1000.	X	
2.NBT.C.1 Write and solve problems involving addition and subtraction within 100.		X

**Standards of Mathematical Practice Applied in this Unit**

1. Attend to precision
2. Construct viable arguments and critique the reasoning of others
3. Look for and make sure of structure

**ENDURING UNDERSTANDINGS:**

- Use place value to add and subtract
- Use the relationship between addition and subtraction
- Understand why it is important to justify answers to problems

**ESSENTIAL QUESTIONS:**

- Why should I use place value to add and subtract numbers?
- Why should I use the relationship between addition and subtraction to help me add or subtract?
- Why should I solve problems and justify solutions?
- How can I solve problems and justify solutions?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.NBT.B.1 Demonstrate fluency with addition and subtraction within 100.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can add and subtract within 100 using place value understandings.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Add, subtract, place value, hundreds, tens, ones, regrouping</li> </ul>	<ul style="list-style-type: none"> <li>Numbers can be added or subtracted using place value units.</li> </ul>	<ul style="list-style-type: none"> <li>I can add within 100 using place value understandings.</li> <li>I can subtract within 100 using place value understandings.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.NBT.B.2 Add up to four two-digit numbers.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can add up to four two-digit numbers.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Two digit number, compose, decompose, place value units</li> </ul>	<ul style="list-style-type: none"> <li>Place value units can be used to add two two-digit numbers.</li> <li>Place value units can be used to add three two-digit numbers.</li> <li>Place value units can be used to add four two-digits numbers.</li> </ul>	<ul style="list-style-type: none"> <li>I can add two two-digit numbers.</li> <li>I can add three two-digit numbers.</li> <li>I can add four two-digit numbers.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	2.NBT.B.3 Add or subtract within 1000, and justify the solution. 2.NBT.B.4 Use the relationship between addition and subtraction to solve problems. 2.NBT.C.1 Write and solve problems involving addition and subtraction within 100.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can add or subtract within 1,000 using place value understanding to justify my solution.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>



<ul style="list-style-type: none"> <li>• solution, justify, add, subtract, compose, decompose, regroup, place value units</li> </ul>	<ul style="list-style-type: none"> <li>• Numbers can be added within 1,000 by regrouping place value units</li> <li>• Numbers can be subtracted within 1,000 by regrouping place value units.</li> <li>• Ten ones can be regrouped to one ten</li> <li>• Ten tens can be regrouped to one hundred</li> <li>• One hundred can be regrouped to ten tens</li> <li>• One tens can be regrouped to ten ones</li> </ul>	<ul style="list-style-type: none"> <li>• I can add within 1,000 using place value understandings to justify my solution.</li> <li>• I can subtract within 1,000 using place value understandings to justify my solution.</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	2.NBT.B.5 Add or subtract mentally 10 or 100 to or from a given number within 1,000.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>• I can use the place value units to add and subtract 10 or 100 from a given number.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Add, subtract, compose, decompose, place value units, tens, hundreds</li> </ul>	<ul style="list-style-type: none"> <li>• Place value can used mentally to add and subtract within 1,000.</li> </ul>	<ul style="list-style-type: none"> <li>• I can mentally add 10 starting at any number within 1,000.</li> <li>• I can mentally subtract 10 starting at any number within 1,000.</li> <li>• I can mentally add 100 starting at any number within 1,000.</li> <li>• I can mentally subtract 100 starting at any number within 1,000.</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>• <b>Performance Task:</b> Apple Farm Field Trip <ul style="list-style-type: none"> <li>○ <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/apple%20farm%20field%20trip.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/apple%20farm%20field%20trip.pdf</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Both</li> <li>• Both</li> </ul>	<ul style="list-style-type: none"> <li>• DOK 1-4</li> <li>• DOK 3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use proportional(base ten blocks) and nonproportional (number disks) models to demonstrate place value.</li> <li>● Use a number line to add or subtract two-digit numbers using place value units.                             <ul style="list-style-type: none"> <li>○ <i>Adding 2-digit Numbers on a Number Line</i> (page 151 in <u>Second-Grade Math in Practice</u>).</li> <li>○ <i>Using Open Number Lines to Add 3-Digit Numbers</i> (page 197 in <u>Second-Grade Math in Practice</u>).</li> </ul> </li> <li>● Expose students to horizontal equations before vertical equations.</li> <li>● Extend understanding of adding two two-digit numbers to adding four two-digit numbers.</li> <li>● Use number disks to compose and decompose tens and hundreds.                             <ul style="list-style-type: none"> <li>○ <b><i>Adding within 1,000 Using Base Ten blocks or Number Disks</i></b> (page 188 in <u>Second-Grade Math in Practice</u>)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Use base ten blocks and number disks to model addition and subtraction problems.</li> <li>● Use number lines to add or subtract two-digit numbers.</li> <li>● Look for partners of ten and use place value units of tens and ones.</li> <li>● Compose and decompose tens and hundreds in order to add and subtract to 1,000.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use color to clarify place value connections</li> <li>● Use place value disks instead of base 10 blocks</li> <li>● Draw number disks to record thinking about adding or subtracting.</li> </ul>	<ul style="list-style-type: none"> <li>● Use manipulatives to solve addition and subtraction problems.</li> <li>● Work with partners to share thinking.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Number Talk - Talking About Our Ideas</b> in <u>Second-Grade Math in Practice</u> on page 155</li> <li>● <b>Diagnose It</b> in <u>Second-Grade Math in Practice</u> on page 218</li> <li>● <b>STEM Activity</b> - Street Math, Space Shuttle Style                             <ul style="list-style-type: none"> <li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/">https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk to share understanding of place value and solve addition and subtraction problems to 1,000 or higher.</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 2nd Grade

**TOPIC:** Relationships and Algebraic Thinking  
(Add and Subtract within 20)

**CAREER CONNECTION:** Accountant, Computer Programmer, Architect, Carpenter

[Weusemath.org](http://www.xpmath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**DESCRIPTION:** Students will use multiple strategies learned through number sense to add and subtract two one digit numbers within 20. This topic lays the foundation for third grade when students are expected to apply math fact fluency to multigit addition and subtraction.

**INSTRUCTIONAL RESOURCES:** Math in Focus, Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** *Ten Sly Piranhas* by William Wise, *Two of Everything* by Lily Toy Hong, *Double Trouble in Walla Walla* by Andrew Clements, *Ten Little Fish* by Audrey Wood, *Ten Black Dots* by Donald Crew

**What We Want Our Students To Know, Understand, and Be Able to Do**

**Missouri Learning Standards Addressed in this Unit**

**PRIORITY**

**SUPPORTING**

2.RA.A.1 Demonstrate fluency with addition and subtraction within 20.

X

**Standards of Mathematical Practice Applied in this Unit**

1. Make sense of problems and persevere in solving them (MP1)
2. Model with mathematics (MP4)

**ENDURING UNDERSTANDINGS:**

- Use multiple strategies to add and subtract numbers within 20.
- Use the relationship between addition and subtraction to add and subtract within 20

**ESSENTIAL QUESTIONS:**

- Why should I use strategies to add and subtract rather than memorize?
- What strategies can I use to add and subtract within 20?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.RA.A.1 Demonstrate fluency with addition and subtraction within 20.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can use multiple strategies to add and subtract two one digit numbers within 20.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Addend, sum, equations, doubles, near doubles, combinations of 10, making 10, difference, ten frames, fact families</li> </ul>	<ul style="list-style-type: none"> <li>There are multiple strategies to add and subtract two one digit numbers within 20.</li> </ul>	<ul style="list-style-type: none"> <li>Use multiple strategies to add and subtract two one digit numbers within 20.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li><b>Performance Task:</b> Incredible Equations <ul style="list-style-type: none"> <li><a href="http://www.insidemathematics.org/assets/common-core-math-tasks/incredible%20equations.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/incredible%20equations.pdf</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Both</li> <li>Both</li> </ul>	<ul style="list-style-type: none"> <li>DOK 1-4</li> <li>DOK 3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Number talks <ul style="list-style-type: none"> <li><i>Talking about Numbers</i>, see page 54 in 2nd Grade Math in Practice Book</li> <li><i>Double Ten Frames</i>, see page 55 in 2nd Grade Math in Practice Book</li> </ul> </li> <li><i>Understanding the Equal Sign</i> (Math in Practice page 45)</li> <li>Math games such as <i>Spin and Make Ten</i></li> </ul>	<ul style="list-style-type: none"> <li>Turn and talk in partners</li> <li>Grand Conversations</li> <li>Use manipulatives such as ten frames, unifix cubes, rekenrek</li> </ul>	<ul style="list-style-type: none"> <li>DOK 1-4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Additional practice with ten frames, counters, or other manipulatives.</li> <li>● Game stations with designated fact sets to meet individual needs.</li> <li>● Additional time to practice addition facts with explanation of the relationship between addition and subtraction.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and talk in partners</li> <li>● Games</li> <li>● Use manipulatives/ hands on conceptual practice</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Create problems that involve addition and subtraction within 20.</li> <li>● <i>Here is my Problem Pass It On</i> (page 56 in <u><a href="#">Second-Grade Math in Practice</a></u>).</li> <li>● <b>STEM Activity</b> - Street Math, Space Shuttle Style                         <ul style="list-style-type: none"> <li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/">https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Real world problems</li> <li>● Turn and talk in partners</li> <li>● Partner work</li> <li>● Small group</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



**CONTENT AREA:** Mathematics **COURSE:** 2nd Grade

**CAREER CONNECTION:** Budget Analysis, Architect, Computer Scientist

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus, Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:**

*Even Steven and Odd Todd* by Kathryn Cristaldi, *The Missing Mittens* by Stuart J. Murphy, *One Odd Day* by Doris Fisher, *My Even Day* by Doris Fisher, *The Odds Get Even* by Pamela Hall

**TOPIC:** Relationships and Algebraic Thinking  
(Develop foundations for multiplication and division)

**DESCRIPTION:** Students will construct rectangular arrays with rows and columns. Arrays use repeated addition and subtraction to make the connection to multiplication and division. Students will use arrays to represent odd and even numbers as well as writing expression with equal addends. This topic lays the foundation for third grade when students are introduced to multiplication and division.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.RA.B.2 Determine if a set of objects has an odd or even number of members. <ul style="list-style-type: none"> <li>a. Count by 2s to 100 starting with any even number.</li> <li>b. Express even numbers as pairings/groups of 2, and write an expression to represent the number using addends of 2.</li> <li>c. Express even numbers as being composed of equal groups and write an expression to represent the number with 2 equal addends.</li> </ul>		X
2.RA.B.3 Find the total number of objects arranged in a rectangular array with up to 5 rows and 5 columns, and write an equation to represent the total as a sum of equal addends.		X

**Standards of Mathematical Practice Applied in this Unit**

1. Model with mathematics
2. Look for and make use of structure

**ENDURING UNDERSTANDINGS:**

- Arrays represent repeated addition and subtraction.
- Numbers are represented in groups of 2 to determine odd or even.
- Create an array to represent an equation with equal addends.
- Repeated addition equations can be written from an array.

**ESSENTIAL QUESTIONS:**

- Why are numbers represented in arrays?
- Why are numbers represented in groups of 2?
- How can representing numbers in groups of 2 determine if a number is odd or even?
- How can an array help you solve a repeated addition problem?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.RA.B.2 Determine if a set of objects has an odd or even number of members. <ol style="list-style-type: none"> <li>Count by 2s to 100 starting with any even number.</li> <li>Express even numbers as pairings/groups of 2, and write an expression to represent the number using addends of 2.</li> <li>Express even numbers as being composed of equal groups and write an expression to represent the number with 2 equal addends.</li> </ol>	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can represent numbers in multiple ways to show if it is odd or even and write it in an equation.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Even, odd, set, group, pair, represent, addends, equal addends, compose, expression, equation</li> </ul>	<ul style="list-style-type: none"> <li>Counting by 2s at even numbers will result in even numbers.</li> <li>Even numbers can be expressed in pairs or groups of 2.</li> <li>Even numbers can be expressed through writing to show equal groups of 2.</li> <li>If a number does not have equal groups of 2, it is an odd number.</li> </ul>	<ul style="list-style-type: none"> <li>I can begin at any even number and count by 2s.</li> <li>I can write an equation to show numbers are pairs or equal groups of 2.</li> <li>I can write an equation with two equal addends.</li> </ul>
<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.RA.B.3 Find the total number of objects arranged in a rectangular array with up to 5 rows and 5 columns, and write an equation to represent the total as a sum of equal addends.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can construct an array to find the total number of objects and write an equation with equal addends to represent the array.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Array, row, column, equation, represent, sum, total, equal addend, repeated addition</li> </ul>	<ul style="list-style-type: none"> <li>Rectangular arrays are made up of rows and columns.</li> <li>Arrays can be represented with an equation.</li> <li>Arrays can be represented with an equal addends equation.</li> </ul>	<ul style="list-style-type: none"> <li>I can construct a rectangular array with up to 5 rows and 5 columns.</li> <li>I can represent an array with an equation using repeated addition.</li> <li>I can represent an array with equal addends.</li> </ul>



**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● <b>Performance Task:</b> <ul style="list-style-type: none"> <li>○ <i>Pepperoni Pizza:</i> <a href="https://www.youcubed.org/tasks/pepperoni-pizza/">https://www.youcubed.org/tasks/pepperoni-pizza/</a> <ul style="list-style-type: none"> <li>● Instead of multiplication equation, students will write a repeated addition equation and determine if the answer is even or odd.</li> </ul> </li> <li>○ <i>Sheep and Ducks:</i> <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/sheep%20and%20ducks.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/sheep%20and%20ducks.pdf</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Both</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> <li>● DOK 3-4</li> <li>● DOK 3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● <b><i>Even and Odd Grid Models</i></b> - Students attempt to create rectangles that are 2 tiles wide to explore odd and even numbers. Second Grade Math in Practice book page 71</li> <li>● Model with a ten frame to show odd or even numbers</li> <li>● Number talks</li> <li>● Math games</li> </ul>	<ul style="list-style-type: none"> <li>● Partner practice with ten frames or dice</li> <li>● Turn and Talks</li> <li>● Playing Math Game with Partners to Generate Conversation</li> <li>● Use manipulatives, such as unit cubes, Rekenrek</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Odd/Even Folded Book</b> - Second Grade Math in Practice book page 79</li> <li>● Allow students to use counters for determining odd or even.</li> <li>● Reinforce odd and even concepts with building or shading towers and explain what makes a number odd or even on page 77 in <u>Second-Grade Math in Practice</u>.</li> <li>● <b>Sticky Note Arrays</b> - Students create arrays with square sticky notes and then write repeated - addition equations for the arrays. Second-Grade Math in Practice book page 80.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and talk</li> <li>● Work with partners</li> <li>● Games</li> <li>● Use manipulatives/ hands on conceptual practice</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Challenge students to given an example of an even or odd number above 20 and prove why it is odd or even.</li> <li>● Have students add odd and even numbers to see what happens (The rules of adding odd and even numbers) and explain what they find out.</li> <li>● <b>Odd/Even Challenge</b> - Students discover rules about odd and even numbers. Second Grade Math in Practice page 80</li> <li>● <b>Roll an Array</b> - Students roll arrays, draw them, write an equation. Second Grade Math in Practice book page 84.</li> <li>● <b>STEM Activity</b> - Street Math, Space Shuttle Style             <ul style="list-style-type: none"> <li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/">https://www.jpl.nasa.gov/edu/teach/activity/street-math-space-shuttle-style/</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Turn and talk</li> <li>● Work with partners</li> <li>● Games</li> <li>● Application problems</li> <li>● Extend to multiplication</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



**CONTENT AREA:** Mathematics      **COURSE:** 2nd Grade

**CAREER CONNECTION:** Engineer, Architect  
 Weusemath.org  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Chapter 12 in Math in Focus,  
 Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** *Give Me Half* by Stuart J. Murphy,  
*Fraction Action* by Loreen Leedy

**TOPIC:** Geometry and Measurement  
 (Reason with Shapes and their Attributes)

**DESCRIPTION:** Students will learn how to define two-dimensional shapes by their attributes and be able to identify the faces of a three-dimensional shape. Students will learn how to partition shapes in equal parts. Students will partition shapes in halves, thirds and fourths. This topic lays the foundation for third grade when students are introduced to fraction notation, fraction models, and equivalent fractions.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.GM.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or sides. Identify triangles, quadrilaterals, pentagons, hexagons, circles and cubes. Identify the faces of three-dimensional objects.		X
2.GM.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of squares.		X
2.GM.A.3 Partition circles and rectangles into two, three or four equal shares, and describe the shares and the whole. Demonstrate that equal shares of identical wholes need not have the same shape.		X

**Standards of Mathematical Practice Applied in this Unit**

1. Attend to Precision
2. Look for and Make Use of Structure
3. Construct Viable Arguments and Critique the Reasoning of Others

**ENDURING UNDERSTANDINGS:**

- Shapes have attributes.
- Three-Dimensional shapes have faces.
- Shapes can be partitioned into equal shares (two, three or four equal shares).
- Shapes can be described as shares and the whole.

**ESSENTIAL QUESTIONS:**

- Why is it important to know the attributes of two-dimensional shape?
- How can I determine how many faces a three-dimensional shape has?
- How can I show halves, thirds, half of, third of, and fourths (or quarter of) with different shapes?
- Why is it important to know how equal shares relate to the “whole”?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or sides. Identify triangles, quadrilaterals, pentagons, hexagons, circles and cubes. Identify the faces of three-dimensional objects.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can identify 2D and 3D shapes by their attributes.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Angle, side, attribute(s), 2D Shape, 3D Shapes, faces, circle, rectangle, square, quadrilateral, parallelogram, pentagon, hexagon, circle, cube</li> </ul>	<ul style="list-style-type: none"> <li>Two-Dimensional shapes have attributes such as angles and sides</li> <li>Three-Dimensional shapes have faces</li> </ul>	<ul style="list-style-type: none"> <li>I can identify 2D shapes by their attributes</li> <li>I can identify the faces of three-dimensional shapes</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of squares. 2.GM.A.3 Partition circles and rectangles into two, three or four equal shares, and describe the shares and the whole. Demonstrate that equal shares of identical wholes need not have the same shape.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can partition circles and rectangles in two, three or four equal shares</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Circle, rectangle, partition, whole, part, equal, shares</li> </ul>	<ul style="list-style-type: none"> <li>Shapes can be divided/partitioned into parts that are equal.</li> <li>A whole can be divided into two or more parts and those parts can be described with a name.</li> </ul>	<ul style="list-style-type: none"> <li>I can partition a shape into equal parts</li> <li>I can partition a shape into two or more parts (halves, thirds and fourths)</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b></p> <p align="center"><b>Performance task or other evidence</b></p> <p align="center"><b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b></p> <p align="center">(1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● <b>Performance Task</b> <ul style="list-style-type: none"> <li>○ 2.GM.A.1 Don’s Shapes <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/don's%20shapes.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/don's%20shapes.pdf</a></li> <li>○ 2.GM.A.2 and 2.GM.A.3 Half and Half <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/half%20and%20half.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/half%20and%20half.pdf</a></li> </ul> </li> <li>● <i>Formative Assessment on page 316</i> in Second Grade Math in Practice book- 2.GM.A.1-students should be able to accurately draw the shape names and be able to list the attributes of the shape.</li> <li>● <i>Formative Assessment on page 331</i> in Second Grade Math in Practice book- 2.GM.A.2 and 2.GM.A.3-students will receive prompts and be able to partition the shapes based on the directions.</li> <li>● <i>Formative Assessment on page 337</i> in Second Grade Math in Practice book- 2.GM.A.2 and 2.GM.A.3-students will show how to decompose a shape in two different ways.</li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Formative</li>   <li>● Formative</li>   <li>● Formative</li>   <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 2-4 depending on the assessment given</li> <li>● DOK 3, 4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● 2.GM.A.1 Identifying 2D and 3D Shapes                             <ul style="list-style-type: none"> <li>○ <b>Defining vs. Non-Defining Attributes of Shapes</b>- Students observe and describe shapes to determine defining attributes. Page 313 in Second Grade Math in Practice book.</li> <li>○ <b>Introducing Quadrilaterals</b>-Students observe shapes and determine the definition of a quadrilateral. Page 317 in Second Grade Math in Practice Book</li> <li>○ <b>Shape Games</b>-pages 318-322 in Second Grade Math in Practice Book.</li> <li>○ Introduce topics by using essential questions to facilitate class conversation.</li> <li>○ Use 'I can' statements to establish and articulate goals for learning.</li> </ul> </li> <li>● 2.GM.A.2 and 2.GM.A.3-Partitioning Shapes                             <ul style="list-style-type: none"> <li>○ <b>Sharing Granola Bars</b>-students partition wholes in halves, thirds and fourths. Page 332 in Second Grade Math in Practice book.</li> <li>○ <b>Brownies and Cupcakes: Introducing Thirds</b> (this is new for second grade students, in first grade they learned how to partition shapes into halves and fourths). Students draw models of a brownie (square or rectangle) and a cupcake (circle) and are introduced to the concept of thirds. Page 329 in Second Grade Math in Practice book.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk, partner work, small group</li> <li>● Engage in turn and talks to or whole discussions of the essential questions and essential understandings.</li> <li>● Self assess and and monitor their own understanding and progress toward the learning objectives.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking
<ul style="list-style-type: none"> <li>● 2.GM.A.1 Identifying 2D and 3D Shapes                             <ul style="list-style-type: none"> <li>○ <b>Exploring and Defining Shapes</b>- Students will explore sets of shapes and develop a definition for each shape. Page 315 in Second Grade Math in Practice Book.</li> </ul> </li> <li>● 2.GM.A.2 and 2.GM.A.3                             <ul style="list-style-type: none"> <li>○ <b>Folded Books</b>-Have students create a folded book about partitioning shapes. Page 341 in Second Grade Math in Practice book.</li> <li>○ <b>Split the Shape</b>-Students will draw a shape and split the shape into equal parts. Page 341 in Second Grade Math in Practice book.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Small group</li> <li>● Turn and Talks</li> <li>● Geo-boards for students to create shapes on</li> <li>● Pattern blocks</li> <li>● Vocabulary cards with pictures of the shape to match the attributes of the shape</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking
<ul style="list-style-type: none"> <li>● <b>Building Two Dimensional Shapes</b>-Students build shapes using plastic coffee stirrers and mini marshmallows or play-dough to practice creating shapes with specified attributes. Page 324 in Second Grade Math in Practice Book.</li> <li>● <b>Talk About it Write About It</b>-Page 323 in Second Grade Math in Practice Book.</li> <li>● <b>Creating Fourths</b>-Students further explore decomposing shapes into fourths. (this activity allows for students to engage in ambiguous thinking about what it means to be large). Page 335 in Second Grade Math in Practice book.</li> </ul>	<ul style="list-style-type: none"> <li>● Extra practice sheets</li> <li>● Turn and Talk</li> <li>● Math conversations</li> <li>● Number talks</li> <li>● Problem Solving Tasks from Enrichment book</li> <li>● Explaining thinking to justify answer</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3-4</li> </ul>



**CONTENT AREA:** Mathematics      **COURSE:** 2nd Grade

**CAREER CONNECTION:** Carpenter, Civil Engineer, Architect

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Chapter 13 in Math in Focus & Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** *Jim and the Beanstalk* by Raymond Briggs, *Inch by Inch* by Leo Lionni

**TOPIC:** Geometry and Measurement  
(Measurement and estimate lengths in standard units)

**DESCRIPTION:** Students will learn how to use different measuring tools to measure objects. Students will learn how to compare two objects by determining how much longer an object is. Students will learn how to estimate length using different measuring units. This topic lays the foundation for the third grade expectation of measuring objects to  $\frac{1}{2}$  and  $\frac{1}{4}$  inch.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.GM.B.4 Measure the length of an object by selecting and using appropriate tools.		X
2.GM.B.5 Analyze the results of measuring the same object with different units.		X
2.GM.B.6 Estimate lengths using units of inches, feet, yards, centimeters and meters.		X
2.GM.B.7 Measure to determine how much longer one object is than another.		X

Standards of Mathematical Practice Applied in this Unit
1. Use appropriate tools strategically 2. Reason abstractly and quantitatively

**ENDURING UNDERSTANDINGS:**

- Objects can be measured with different units (cm, m, in, ft ).
- Objects can be measured with different measurement tools (rulers, yardsticks, meter sticks and measuring tapes).
- Two measured objects can be compared.
- Objects can be estimated can be a quick way to determine the length of an object.

**ESSENTIAL QUESTIONS:**

- Why should I know the different units objects can be measured with?
- How can I choose an appropriate measuring tool to measure objects?
- Why is it important for me to know which measuring tool to use when measuring an object?
- How can I compare two different measured objects?
- Why is it important to understand different units of measurement to help estimate the length of an object?



<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.B.4 Measure the length of an object by selecting and using appropriate tools. 2.GM.B.5 Analyze the results of measuring the same object with different units.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can choose an appropriate measuring tool to measure an object.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Ruler, length, measuring tool, centimeter ruler, meter stick, yardstick, unit,</li> </ul>	<ul style="list-style-type: none"> <li>There are different units of measurement that can be used to measure an object.</li> <li>Different measuring tools should be selected to measure objects.</li> </ul>	<ul style="list-style-type: none"> <li>I can use different units of measurement when measuring an object.</li> <li>I can choose an appropriate measure tool to measure an object.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.B.6 Estimate lengths using units of inches, feet, yards, centimeters and meters.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can use mental benchmarks to help estimate the length of an object.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Estimate, length, inches, feet, centimeters, meters, yards, mental benchmark</li> </ul>	<ul style="list-style-type: none"> <li>Length of an object can be estimated in inches, centimeters, feet, meters or yards with the measuring tool.</li> </ul>	<ul style="list-style-type: none"> <li>I can estimate the length of an object using inches, centimeters, feet, meters or yards.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.B.7 Measure to determine how much longer one object is than another.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can compare two objects and determine how much longer an object is than the other.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Compare, length, longer than,</li> </ul>	<ul style="list-style-type: none"> <li>Lengths can be compared.</li> <li>Lengths of objects can be compared to determine how much longer an object is than the other object.</li> </ul>	<ul style="list-style-type: none"> <li>I can compare the length of two objects.</li> <li>I can compare the length of two objects to determine how much longer one object is than the other.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b>  <b>Performance task or other evidence</b>  <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b>                      (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● <b>Performance Event:</b> Put several objects that measure less than one foot in a gallon zipper bag. Hand student ruler with inches and centimeters. Have students measure to nearest inch/cm. Watch and record data. Did they choose correct side of ruler, line up ruler at beginning, accurate measure and correctly states the unit measured, page 235 in Second Grade Math in Practice book.</li> <li>● <b>Formative Assessment:</b> <ul style="list-style-type: none"> <li>○ Give the following directions. Write one object you would measure with a ruler and one object you would measure with a yardstick. Tell why you would choose to measure the objects with the ruler and yardstick.</li> <li>○ Give students a list of items the students will decide which appropriate measurement tool they should use to measure each item. Page 229 in Second Grade Math in Practice book.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1- -Match the word with the picture</li> <li>● DOK 2- Performance Event</li> <li>● DOK 3- Formative Assessment</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Read Leo Lionni’s book Inch by Inch to the class. Provide students with a 1-inch square tile and have them explore the classroom using their square tile to find things that are one inch long.</li> <li>● Model a lesson on when to select the appropriate tool to measure. For example, when measuring the door to classroom would I want to use 1-inch tiles? Demonstrate how long it would take to use the inch tiles. Compare that to using a yardstick.</li> <li>● Put a collection of objects in a ziplock bag. Have students select different objects and practice measuring them. Why would I use inches for an item instead of feet?</li> <li>● <a href="https://www.illustrativemathematics.org/content-standards/2/MD/A/1/tasks/2069">https://www.illustrativemathematics.org/content-standards/2/MD/A/1/tasks/2069</a></li> <li>● <a href="https://www.illustrativemathematics.org/content-standards/2/MD/A/tasks/1313">https://www.illustrativemathematics.org/content-standards/2/MD/A/tasks/1313</a></li> <li>● <b>Inches to Feet</b> - Students are introduced to the measurement unit of one foot. Students find objects that are one foot long. Second Grade Math in Practice book page 226</li> <li>● <b>Feet to Yards</b> - Students connect their understanding that twelve inches equals one foot to the discovery that three feet equals one yard. Students find objects that are one yard long. Second Grade Math in Practice book page 227</li> <li>● <b>Which Tool?</b> Student use their understandings of measurement tools and</li> </ul>	<ul style="list-style-type: none"> <li>● Using a 1-inch tile, search around the room for things that are one inch long. Record what you find. Estimate what in the classroom would be 5 inches long. Check your estimation by using the 1-inch tile.</li> <li>● Measure your desk in inches and feet. Turn and talk to a partner about the difference between the two. Why was it more inches than feet?</li> <li>● Vocabulary Sort-- Using the words provided, sort them into groups based on their math meaning. Then give the group a title and explain why they belong together. The words are:centimeter, difference, foot, inch, length, longer, measuring tape, meter, meter stick, ruler, unit, yardstick.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 2- Skill/Concept</li> <li>● DOK 2- Skill/Concept</li> <li>● DOK 3- Strategic Thinking</li> </ul>

<p>lengths to select the appropriate tools for measuring. Second Grade Math in Practice page 229</p> <ul style="list-style-type: none"> <li>● Estimate and Measure Students estimate and then find the length of different objects. Second Grade Math in Practice book page 230</li> </ul>		
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Circulate and observe students as they measure. Support students who continue to struggle lining up their rulers. Model how to line the ruler up correctly.</li> <li>● Pull a small group to do a strategy lesson on measuring. Use the same object and help them as they try to measure item with</li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> </ul>	<ul style="list-style-type: none"> <li>● Watch a math video like <a href="https://www.youtube.com/watch?v=lu6YaZoh4ec">https://www.youtube.com/watch?v=lu6YaZoh4ec</a></li> <li>● Work with a partner to measure items around your classroom like: pencil box, kleenex box, dry erase board, etc. Compare answers.</li> <li>● Practice measuring using math worksheets like from: <a href="https://www.superteacherworksheets.com/measure-in-ft-yd.html">https://www.superteacherworksheets.com/measure-in-ft-yd.html</a></li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1- Recall</li> <li>● DOK 2- Skill/Concept</li> <li>● DOK 1 - Recall</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Create envelopes that have eight strips of cardstock inside. Strips should vary in length. Provide each group with an envelope. Have student create a table in their journal to record measurements. Take turns measuring strips of paper. Turn to partner and talk about how to create a line plot.</li> <li>● Create a Measurement Scavenger Hunt for</li> </ul>	<ul style="list-style-type: none"> <li>● Make a line plot with measured data. Have students design questions for their partners based on the data in the line plot. Take turns answering each others questions.</li> <li>● Create a math problem that involves measurement. Exchange with a friend and solve.</li> <li>● Play measurement games like:</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3- Strategic Thinking</li> <li>● DOK 4 Extended Thinking</li> </ul>

<p>kids to find certain lengths around the classroom using both centimeters and inches. Have them answer questions like: if you measured the same object with cm and inches, would it measure more inches or centimeters and why is the measurement different when you use different units.</p> <ul style="list-style-type: none"><li>● Write about it-- Have students write a response to this math question. Jamie said she is going to measure the length of the school hall in inches. Is that a good idea? Why or why not?</li><li>● <b>STEM Activity</b> - Rockets by Size<ul style="list-style-type: none"><li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/rockets-by-size/">https://www.jpl.nasa.gov/edu/teach/activity/rockets-by-size/</a></li></ul></li></ul>	<p><a href="http://mrnussbaum.com/measurement-workshop/">http://mrnussbaum.com/measurement-workshop/</a></p>	
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**CONTENT AREA:** Mathematics

**COURSE:** 2nd Grade

**TOPIC:** Geometry and Measurement  
Relate addition and subtraction to length)

**CAREER CONNECTION:** Carpenter, Civil Engineer, Architect  
[Weusemath.org](http://www.xpmath.org)  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**DESCRIPTION:** Students will learn how to apply addition and subtraction strategies to help solve measurement problems. Students will learn how to use a number line to add and subtract measurement problems. This topic lays the foundation for third grade when students are expected to measure using line plots with whole, half, and quarter units.

**INSTRUCTIONAL RESOURCES:** Chapter 13 in Math in Focus & Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** *Inch by Inch* by Leo Lionni

**What We Want Our Students To Know, Understand, and Be Able to Do**

**Missouri Learning Standards Addressed in this Unit**

	<b>PRIORITY</b>	<b>SUPPORTING</b>
2.GM.C.8 Use addition and subtraction within 100 to solve problems involving lengths that are given in the same units.		X
2.GM.C.9 Represent whole numbers as lengths on a number line, and represent whole-number sums and differences within 100 on a number line.		X

**Standards of Mathematical Practice Applied in this Unit**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively

**ENDURING UNDERSTANDINGS:**

- How to apply addition and subtraction strategies when solving problems in measurement.
- How to use a number line to represent sums and differences within 100.
- How to use a measurement tool as a number line.

**ESSENTIAL QUESTIONS:**

- How can I use addition and subtraction strategies to help me solve measurement problems?
- How can I use a measurement tool as a number line to help add and subtract two measurements?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.C.8 Use addition and subtraction within 100 to solve problems involving lengths that are given in the same units.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can use addition and subtraction strategies to solve measurement problems.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Unit, addition, subtraction, sums, differences, length</li> </ul>	<ul style="list-style-type: none"> <li>Addition and subtraction strategies can be used to solve problems involving lengths in the same units.</li> </ul>	<ul style="list-style-type: none"> <li>I can apply addition and subtraction strategies to help solve measurement problems.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.C.9 Represent whole numbers as lengths on a number line, and represent whole-number sums and differences within 100 on a number line.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can use a number line to find the sum and difference of lengths.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Sums, difference, addition, subtraction, number line, length, whole-number</li> </ul>	<ul style="list-style-type: none"> <li>A number line can be used to help add and subtract the length of two objects.</li> <li>Measuring tools can be used as a number line to help add and subtract measurement problems.</li> </ul>	<ul style="list-style-type: none"> <li>I can use a number line to add and subtract the length of an object.</li> <li>I can use a measuring tool as a number line to help add and subtract measurement problems.</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>Performance Task: <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/high%20horse.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/high%20horse.pdf</a> <ul style="list-style-type: none"> <li>High Horse</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Both</li> <li>Formative</li> </ul>	<ul style="list-style-type: none"> <li>1-4</li> <li>3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Using Addition and Subtraction to Solve Measurement Problems</b> - Students use measurement contexts to solve addition and subtraction problems, connecting what they already know about these problem structure to new context. Second Grade Math in Practice page 237</li> <li>● <b>What's the Difference?</b> Students connect finding the difference in length to their experience using bar models. Second Grade Math in Practice page 238</li> <li>● <b>Displaying Data on Line Plots</b>-Students will create a line plot to display measurement data. Page 241 in Second Grade Math in Practice book.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk, partner work, small group</li> <li>● Engage in turn and talks to or whole group discussions of the essential questions and essential understandings.</li> <li>● Use I can statements to show understanding of the essential questions.</li> </ul>	<ul style="list-style-type: none"> <li>● 1 - 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Exploring Problems</b> - Students use pinch cards to decide which operation they would use to solve the problem. Second Grade Math in Practice page 240.</li> <li>● Students practice additional problems such as those found on Scholastic website: <a href="http://studyjams.scholastic.com/studyjams/jams/math/measurement/add-sub-measurements.htm">http://studyjams.scholastic.com/studyjams/jams/math/measurement/add-sub-measurements.htm</a></li> <li>● Refer to Math in Focus Remediation book Chapter 13</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk, partner or small group discussions</li> <li>● Make connections to other addition or subtraction word problems</li> <li>● Use number bonds,or bar models to model the addition of subtraction problems</li> <li>● Review vocabulary and key words that would indicate whether to add or subtract</li> </ul>	<ul style="list-style-type: none"> <li>● 1-2</li> </ul>



**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking
<ul style="list-style-type: none"> <li>● <b>Stretch and Compare</b> - Student compare the lengths of objects at rest and when stretched to find the differences in length. Second Grade Math in Practice page 239</li> <li>● <b>Talk About It/Write About It</b> - Students defend which operation you use when you want to compare to measurements. Second Grade Math in Practice page 240.</li> <li>● <b>Making Line Plots from Measured Data</b> - Students generate a set of data by measuring strips of paper and then display their data on line plots. Second Grade Math in Practice page 242.</li> <li>● <b>STEM Activity</b> - Rockets by Size               <ul style="list-style-type: none"> <li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/rockets-by-size/">https://www.jpl.nasa.gov/edu/teach/activity/rockets-by-size/</a></li> <li>○ Extend this activity by having students write addition and subtraction problems to compare the rockets.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk</li> <li>● Students use academic vocabulary from unit to explain and justify their thinking.</li> <li>● Grand Conversations</li> <li>● Number Talks</li> <li>● STEM Activities</li> </ul>	<ul style="list-style-type: none"> <li>● 3-4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 2nd Grade

**TOPIC:** Geometry and Measurement  
(Work with Time and Money)

**CAREER CONNECTION:** Cost Estimator, Budget Analyst  
[Weusemath.org](http://www.xpmath.org)  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**DESCRIPTION:** Students will learn to tell and write time to the nearest five minutes on both an analog clock and digital clock. They will also learn the definition of a.m. and p.m. and how it defines time. Students will describe time in terms of hours and minutes and understand their relationship. They will also understand the relationship between a digital clock and an analog clock. Students will learn the value of dollar bills, quarters, dimes, nickels, and pennies as well as the combination of these values together. This topic lays the foundation for third grade when students are expected to tell time to the nearest minute, add and subtract time intervals, and solve complex problems involving money.

**INSTRUCTIONAL RESOURCES:** Chapter 11 in Math in Focus (Money) and Chapter 14 in Math in Focus (Time) & Math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** Rodeo Time by Stuart J. Murphy,  
The Penny Pot by Stuart J. Murphy

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.GM.D.1 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	X	
2.GM.D.2 Describe a time shown on a digital clock as representing hours and minutes, and relate a time shown on a digital clock to the same time on an analog clock.	X	
2.GM.D.3 Find the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using \$ and ¢ appropriately.	X	
2.GM.D.4 Find combinations of coins that equal a given amount.	X	

**Standards of Mathematical Practice Applied in this Unit**

1. Use appropriate tools strategically
2. Look for and make use of structure?

**ENDURING UNDERSTANDINGS:**

- The value of dollar bills and coins are related.
- A.M. and P.M. are necessary when telling time on both an analog and digital clock.
- Coins can be combined in multiple ways to represent the same amount.
- Each coin has a specific value.

**ESSENTIAL QUESTIONS:**

- Why is the use of a.m. and p.m. important to telling time?
- How are the values of coins related to each other?
- Why can coins be combined in various ways to equal a given amount?
- Why can a \$ and a cent sign be used to represent the value of coins?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.D.1 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. 2.GM.D.2 Describe a time shown on a digital clock as representing hours and minutes, and relate a time shown on a digital clock to the same time on an analog clock.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can tell and write time to the nearest 5 minutes from an analog and digital clock using am or pm.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Analog clock, digital clock, AM, ,PM, hours, minutes</li> </ul>	<ul style="list-style-type: none"> <li>Time on an analog clock and digital clock is related.</li> <li>A.M. represents the hours from 12am- 12pm.</li> <li>PM represent the hours from 12pm - 12am.</li> <li>There are 60 minutes in one hour.</li> </ul>	<ul style="list-style-type: none"> <li>I can tell time to the nearest 5 minutes from an analog clock.</li> <li>I can tell time to the nearest 5 minutes from a digital clock.</li> <li>I can write time to the nearest 5 minutes from a digital and analog clock.</li> <li>I can use am or pm when telling time.</li> <li>I can describe time as hours and minutes.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.GM.D.3 Find the value of combinations of dollar bills, quarters, dimes, nickels and pennies, using \$ and ¢ appropriately. 2.GM.D.4 Find combinations of coins that equal a given amount.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can find the value of various combinations of coins and their equal amounts using either \$ or ¢.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Combination, dollar bills, quarters, nickels, pennies, dimes, dollar sign (\$), cent sign (¢), equal, equivalent, total</li> </ul>	<ul style="list-style-type: none"> <li>Quarters are worth 25 cents.</li> <li>Dimes are worth 10 cents.</li> <li>Nickels are worth 5 cents.</li> <li>Pennies are worth 1 cent.</li> <li>Coins can be combined in multiple ways to equal the same amount.</li> <li>The dollar sign and the cent sign can be used to represent the same amount.</li> </ul>	<ul style="list-style-type: none"> <li>I can identify the value of quarters, dimes, nickels, and pennies.</li> <li>I can use the value coins to find the total of any coin combinations.</li> <li>I can use the dollar sign and the cent sign correctly.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b></p> <p align="center"><b>Performance task or other evidence</b></p> <p align="center"><b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b></p> <p align="center">(1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● Performance Task               <ul style="list-style-type: none"> <li>○ Pocket Money- 2.GM.D.3 and 2.GM.D.4 <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/pocket%20money.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/pocket%20money.pdf</a></li> <li>○ Splitting the Clock 2.GM.D.1                   <ul style="list-style-type: none"> <li>▪ Students partition into halves and quarters, and then twelfths, as they create a clock face. Page 252 in Second Grade Math in Practice book.</li> </ul> </li> </ul> </li> <li>● Formative Assessment- 2.GM.D.1 and 2.GM.D.3               <ul style="list-style-type: none"> <li>○ Students will show time on each clock face and write two different ways they could say each time in words. Page 256 in Second Grade Math in Practice book.</li> <li>○ Give students situations that involve a.m. and p.m.. Page 258 in Second Grade Math in Practice book.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<p><b>Time-telling time to the nearest 5 minutes</b></p> <ul style="list-style-type: none"> <li>● <b>Understanding A.M. and P.M.</b>-students build their understanding that there are twenty-four hours in one day and that our 12-hour analog clock can be used with a.m. and p.m. to identify the time of the day. Page 257 in Second Grade Math in Practice book.</li> <li>● Have conversations with students on how to determine when it is a.m. and p.m. and that the transition between a.m. and p.m. always occurs at 12:00.</li> <li>● Discuss with students how the day starts at midnight.</li> <li>● Discuss with students when looking at the minute hand that each number represents 5 minute intervals.</li> </ul> <p><b>Money-find the value of combinations using dollars and coins.</b></p> <ul style="list-style-type: none"> <li>● Have students practice naming the value of coins and review skip counting by fives and tens.</li> <li>● Work with students to learn that 1 quarter is twenty five cents, 2 quarters is fifty cents, 3 quarters is seventy five cents and 4 quarters equals a dollar.</li> <li>● Trading Coins-Students work with partners to count coins and exchange the for fewer coins. Page 283 in Second Grade Math in Practice book.</li> </ul>	<ul style="list-style-type: none"> <li>● Actively use concrete and/or virtual manipulatives, such as analog and digital clocks, interactive whiteboard, etc. to represent time and solve problems.</li> <li>● I can statements connected to essential questions and understanding.</li> <li>● Analog clocks</li> <li>● Students can create their own analog clock</li> </ul> <ul style="list-style-type: none"> <li>● Name the value of the different coins.</li> <li>● Use real money, play money, or virtual money to solve problems.</li> <li>● Use the \$ and ¢ symbols appropriately when recording money.</li> <li>● Determine the coins and bills needed to equal a given amount of money.</li> <li>● Determine the amount of change given when paying for a purchase.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Characteristics of an Analog Clock</b> - Students will explore an analog clock. Second Grade Math in Practice book page 249</li> <li>● <b>Make a Human Clock</b> - Students will build the connection between a number line and an analog clock. Second Grade Math in Practice book page 250</li> <li>● <b>What Time Is It?</b> Students will pick a time card and then show the time on a clock face. Second Grade Math in Practice book page 259</li> <li>● <b>Ten Frame Pennies</b> - Students use ten frames to review the values of pennies, nickels, dimes, and quarters. Second Grade Math in Practice book page 268</li> </ul>	<ul style="list-style-type: none"> <li>● Each student can have their own analog clock when exploring the characteristics of an analog clock.</li> <li>● Students can create an analog clock with a minute visual showing the 5 minute intervals on their clock.</li> <li>● Reflect on misunderstandings</li> <li>● Work through difficult problems, with the understanding that breakthroughs often emerge from confusion and struggle</li> <li>● Use manipulatives to show understanding - Use real money, play money, or virtual money to solve problems; use real and virtual analog and digital clocks</li> <li>● Use pictorial representations to show understanding</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1,2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems</li> <li>● Ask questions that require explanation and justification</li> <li>● <b>Talk About It/Write About It</b> - Students will be given statements in which they need to agree or disagree with justification Second Grade Math in Practice book page 260</li> <li>● <b>Time Spin</b> - Students will use spinners with</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk</li> <li>● Accountable Talk</li> <li>● Math Games</li> <li>● Small Group Work</li> <li>● Partnerships</li> <li>● Number Talk</li> <li>● STEM Connection</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3,4</li> </ul>

<p>hours and minutes and write the time. They will add A.M. and P.M. to the time and justify what they might be doing at that time of day. Second Grade Math in Practice book page 262</p> <ul style="list-style-type: none"><li>● <b>Who Has More?</b> Students compare the total value of two sets of coins to find which is more. Second Grade Math in Practice book page 285</li><li>● <b>Solving Problems with Number Bonds -</b> Students use coins to show different ways to make money values and then represent the combinations with numbers bonds. Second Grade Math in Practice book page 285</li><li>● <b>Talk About It/Write About It -</b> Second Grade math in Practice book page 288</li><li>● STEM Activity - Observing the Moon <a href="https://www.jpl.nasa.gov/edu/teach/activity/observing-the-moon/">https://www.jpl.nasa.gov/edu/teach/activity/observing-the-moon/</a></li></ul>		
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**CONTENT AREA:** Mathematics

**COURSE:** 2nd Grade

**TOPIC:** Data and Statistics  
(Represent and Interpret Data)

**CAREER CONNECTION:** Sports Analyst, Meteorologist  
[Weusemath.org](http://www.xpmath.org)  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Chapter 17 in Math in Focus and math in Practice Teaching Second Grade Math

**LITERATURE CONNECTION:** *Lemonade for Sale* by Stuart J. Murphy

**DESCRIPTION:** Students will learn how to create a line plot, a picture graph, and a bar graph from a set of data. Students will learn to generate measurement data and record this information on a line plot and/or graph. Students will learn how to solve problems from information in a line plot, picture graph, or bar graph. They will also draw conclusions from line plots, picture graphs, and bar graphs. This topic lays the foundation for third grade when students create and interpret scaled bar and picture graphs.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
2.DS.A.1 Create a line plot to represent a set of numeric data, given a horizontal scale marked in whole numbers.		X
2.DS.A.2 Generate measurement data to the nearest whole unit, and display the data in a line plot.		X
2.DS.A.3 Draw a picture graph or a bar graph to represent a data set with up to four categories.		X
2.DS.A.4 Solve problems using information presented in line plots, picture graphs and bar graphs.		X
2.DA.A.5 Draw conclusions from line plots, picture graphs and bar graphs.		X

**Standards of Mathematical Practice Applied in this Unit**

1. Make sense of problems and and persevere in solving them.
2. Construct viable arguments and reasoning of others.

**ENDURING UNDERSTANDINGS:**

- Line plots, pictures graphs, and bar graphs are all ways to represent data.
- Line plots and graphs can represent different types of information such as measurement and scores.
- Line plots and graphs are used to solve real world problems.
- Conclusions can be made after analyzing line plots and graphs.

**ESSENTIAL QUESTIONS:**

- How are line plots, pictures graph, and bar graphs related?
- Why are line plots, picture graphs, and bar graphs used to represent information?
- What information can be represented on line plots, picture graphs, and bar graphs?
- How can I use the information represented on line plots, picture graphs, and bar graphs to solve problems and make conclusion?



<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.DS.A.1 Create a line plot to represent a set of numeric data, given a horizontal scale marked in whole numbers. 2.DS.A.2 Generate measurement data to the nearest whole unit, and display the data in a line plot.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can generate data and create a line plot to represent the information in whole numbers.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Line plot, data, horizontal, scale, whole number, measurement</li> </ul>	<ul style="list-style-type: none"> <li>Line plots represent data.</li> <li>Data can be generated and represented on a line plot.</li> </ul>	<ul style="list-style-type: none"> <li>I can represent it on a line plot.</li> <li>I can create measurement data and represent it on a line plot.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	2.DS.A.3 Draw a picture graph or a bar graph to represent a data set with up to four categories.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can create a graph to represent data with no more than four categories.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Picture graph, bar graph, data, categories, set</li> </ul>	<ul style="list-style-type: none"> <li>Pictures graphs represent data of multiple categories.</li> <li>Bar graphs represent data with multiple categories.</li> </ul>	<ul style="list-style-type: none"> <li>I can create a picture graph with one, two, three, or four categories.</li> <li>I can create a bar graph with one, two, three, or four categories.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	2.DS.A.4 Solve problems using information presented in line plots, picture graphs and bar graphs. 2.DA.A.5 Draw conclusions from line plots, picture graphs and bar graphs.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can analyze information to solve problems and make conclusions from line plots and graphs.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Line plot, picture graph, bar graph, conclusion</li> </ul>	<ul style="list-style-type: none"> <li>Line plots represent information which can be used to solve problems.</li> <li>Picture graphs represent information which can be used to solve problems.</li> </ul>	<ul style="list-style-type: none"> <li>I can solve problems using the information in a line plot.</li> <li>I can solve problems using the information in a picture graph.</li> </ul>

	<ul style="list-style-type: none"> <li>● Bar graphs represent information which can be used to solve problems.</li> <li>● Conclusion can be made from the information represented in line plots, picture graphs, and bar graphs.</li> </ul>	<ul style="list-style-type: none"> <li>● I can solve problems using the information in a bar graph.</li> <li>● I can make conclusion about the information in a line plot.</li> <li>● I can make conclusions about the information in a picture graph.</li> <li>● I can make conclusion about the information in a bar graph.</li> </ul>
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**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b></p> <p align="center">Performance task or other evidence</p> <p align="center"><b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b></p> <p align="center">(1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Chapter assessment, quizzes, exit slips, observation, checklists, and/or self-reflections</li> <li>● Performance Based Assessment: <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/our%20pets.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/our%20pets.pdf</a> <ul style="list-style-type: none"> <li>○ Our Pets</li> </ul> </li> <li>● Formative Assessment <ul style="list-style-type: none"> <li>○ Students will answer questions based on a picture graph. Page 297 in Second Grade Math in Practice book.</li> <li>○ Students create a bar graph based on data given to them. Once they create the bar graph they will answer questions based on the data on the graph. Page 306 in Second Grade Math in Practice book.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Both</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1-4</li> <li>● DOK 3-4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Creating Picture Graphs</b> - Students create their own picture graphs and then observe and describe the data on classmates' graphs. Second Grade Math in Practice book page 294</li> <li>● <b>Interpreting Bar Graphs</b> - Students see parts of a bar graph and try to make sense of the graph until all parts are revealed. Second grade Math in practice book page 302</li> <li>● <b>Creating and Using a Bar Graph to Analyze Data</b> - Students use information to create a bar graph and develop questions to ask, based on the data. Second Grade Math in practice book 304.</li> <li>● Students can also use the same activities to represent the same data in a line plot.</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk</li> <li>● Grand Conversation</li> <li>● Use manipulatives to create line plots, picture graphs, bar graphs</li> <li>● Math Games</li> <li>● Use I can statements based on essential questions and understandings.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1 - 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Introducing and Interpreting Picture Graphs</b>-Students are introduced to the picture graphs as a way to display data and create and interpret picture graphs. Page 292 in Second Grade Math in Practice book.</li> <li>● <b>Scoop and Graph It</b>-Students work with partners to scoop colored cubes or counters and create a graph to show the colors scooped. Page 298 in Second Grade Math in Practice book.</li> <li>● Use sentence starters to help students analyze a picture graph and be able to have conversations</li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk about what they are noticing about the graphs.</li> <li>● Use manipulatives to help create a picture graph and to help compare the results of the picture graph.</li> <li>● Use sentence starters to help guide conversations about the graph they are analyzing.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1, 2</li> </ul>

<p>about the graph</p> <ul style="list-style-type: none"> <li>○ This graph is about....</li> <li>○ I see more people picked ___ than ____....</li> <li>○ Most people chose.....</li> </ul> <ul style="list-style-type: none"> <li>● Students can also use the same activities to represent the same data in a line plot, picture graph, and bar graph using the same differentiation to help with understanding of the concept.</li> </ul>		
<p><b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i></p>		
TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <b>Comparing Picture Graphs</b> - Students create and compare picture graphs and write three questions that could be answered using their picture graph. Second Grade Math in Practice book page 297</li> <li>● <b>Using Equations to Justify Reasoning</b> - Student analyze a picture graph and use equations to justify their thinking. Second Grade Math in Practice book page 297</li> <li>● <b>What Is It Saying?</b> Students will be given a picture graph and answer prompts. Second Grade Math in Practice page 298</li> <li>● <b>Talk About It/Write About It</b> Students will explain how to picture graph and its importance. Second Grade math in Practice page 299</li> <li>● Students can also use the same activities to represent the same data in a line plot, picture graph, and bar graph.</li> <li>● <b>STEM Activity</b> - Graphing Sea Level Trends <ul style="list-style-type: none"> <li>○ <a href="https://www.jpl.nasa.gov/edu/teach/activity/graphing-sea-level-trends/">https://www.jpl.nasa.gov/edu/teach/activity/graphing-sea-level-trends/</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Turn and Talk</li> <li>● Math conversations</li> <li>● Number talks</li> <li>● Problem Solving Tasks from Enrichment book</li> <li>● Explaining thinking to justify answer</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 3, 4</li> </ul>

**Third Grade Curriculum**



<p><b>CONTENT AREA:</b> Mathematics</p> <p><b>COURSE:</b> 3rd Grade</p> <p><b>CAREER CONNECTION:</b></p> <ul style="list-style-type: none"> <li>• Carpenter, Baker, Bank Teller, Welder, Landscaper, Chemist, Pharmacist, Seamstress</li> </ul> <p><b>INSTRUCTIONAL RESOURCES:</b> Math in Focus, Math in Practice Teaching Third Grade math</p> <p><b>LITERATURE CONNECTION:</b>  <i>Zero the Hero</i> by Joan Holub  <i>A Place for Zero</i> by Angeline Sparagna LoPresti  <i>Mission Addition</i> by Loreen Leedy  <i>How Many Blue Birds Flew Away?</i> by Paul Giganti  <i>The Action of Subtraction</i> by Brian Cleary  <i>The Best of Times</i> by Greg Tang  <i>Earth Day- Hooray</i> by Stuart Murphy  <i>Toasty Toes: Counting by Tens</i> by Michael Dahl</p>	<p><b>TOPIC:</b> Number Sense and Operations in Base Ten</p> <p><b>DESCRIPTION:</b> This topic develops ideas about the meaning of operations with whole numbers, the development of computational fluency, the structure of place value, the base ten number system and generalizations about rounding numbers. Students tie in their addition and subtraction to develop understanding of the concept of patterns and real world. Students will communicate his or her reasoning precisely and will critique the reasoning of others.</p> <p>In second grade students understood place value to hundreds, identified the mid-point between hundreds, added within 100, subtracted two-digit numbers, and investigated even numbers.</p> <p>This unit is setting students up for fourth grade. Next year, students will have to round multi-digit numbers to any place, add and subtract proficiently with the standard algorithm, explore addition and subtraction of decimals, and use basic facts to support understanding with multi-digit operations.</p>
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What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
NBT.A.1 Round whole numbers to the nearest 10 or 100.	X	
NBT.A.2 Read, write and identify whole numbers within one hundred thousand using base ten numerals, number names and expanded form.	X	
NBT.A.3 Demonstrate fluency with addition and subtraction within 1000.		X
NBT.A.4 Multiply whole numbers by multiples of 10 in the range 10-90.		X
Standards of Mathematical Practice Applied in this Topic		
4. Model with mathematics 6. Attend to precision 8. Look for and express regularity in repeated reasoning		

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Rounding is a method of approximating an answer.</li> <li>● Rounding is process for finding the multiple of 10, 100, etc., closest to a given number.</li> <li>● Different numerical expressions can have the same value. The value of one expression can be less than (or greater than) the value of the other expression.</li> <li>● The base 10 number system is a well-defined structure based on groups of 10.</li> <li>● Flexible methods of computation within addition and subtraction involve grouping numbers in a variety of ways using place value</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How is rounding an efficient method for estimating? Why and when would we round?</li> <li>● How can sums and differences be found mentally?</li> <li>● How can sums and differences be estimated?</li> <li>● How are greater numbers read and written?</li> <li>● How can whole numbers be compared and ordered?</li> <li>● Why are place value strategies important when solving addition and subtraction problems?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	NBT.A.1 Round whole numbers to the nearest 10 or 100.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can round numbers to the nearest 10 or 100.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Round, hundreds, tens, ones</li> </ul>	<ul style="list-style-type: none"> <li>● I understand when numbers are rounded, they are easier to use mental math</li> <li>● I understand the closer you round to the actual number the easier it is to estimate in your head</li> <li>● I understand numbers can be rounded to multiples of 10 or 100</li> </ul>	<ul style="list-style-type: none"> <li>● I can round numbers to the nearest 10</li> <li>● I can round numbers to the nearest 100</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	NBT.A.2 Read, write and identify whole numbers within one hundred thousand using base ten numerals, number names and expanded form.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can read, write, and identify numbers within one hundred thousand using base ten numerals, number names, and expanded form.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Standard form, expanded form, written</li> </ul>	<ul style="list-style-type: none"> <li>● I understand numbers can be written in</li> </ul>	<ul style="list-style-type: none"> <li>● I can read and write numbers in standard</li> </ul>

form/ number names, place value, ones, tens, hundreds, thousands, ten thousands, hundred thousands, base ten	standard form based on place value <ul style="list-style-type: none"> <li>• I understand numbers can be written out in word form</li> <li>• I understand numbers can be written in expanded form based on each digit value</li> </ul>	form within 100,000 <ul style="list-style-type: none"> <li>• I can read and write numbers in written form within 100,000</li> <li>• I can read and write numbers in expanded form within 100,000</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT.A.3. Demonstrate fluency with addition and subtraction within 1000.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can demonstrate fluency with addition and subtraction within 1000.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Add, subtract, part, whole, sum, difference, addend</li> </ul>	<ul style="list-style-type: none"> <li>• I understand two and three digit numbers can be added using place value</li> <li>• I understand two and three digit numbers can be subtracted using place value</li> <li>• I understand regrouping can help add two and three digit numbers</li> <li>• I understand regrouping can help subtract two and three digit numbers</li> <li>• I understand the relationship between addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>• I can add numbers to 1000 without regrouping</li> <li>• I can add numbers to 1000 with regrouping</li> <li>• I can subtract numbers to 1000 without regrouping</li> <li>• I can subtract numbers to 1000 with regrouping</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT.A.4 Multiply whole numbers by multiples of 10 in the range 10-90.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can multiply numbers by multiples of 10 up to 90.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Multiply, multiple, tens</li> </ul>	<ul style="list-style-type: none"> <li>• Place value helps me multiply numbers that are multiples of ten</li> <li>• Properties of operations help me multiply numbers that are multiples of ten</li> </ul>	<ul style="list-style-type: none"> <li>• Use place value to multiply numbers by a multiple of ten</li> <li>• Use properties of operation to multiply numbers by a multiple of 10</li> </ul>





**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce topics by using essential questions to facilitate class conversation</li> <li>● Support students in exploring tasks without taking over student thinking</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems and making connections to familiar skip counting and repeated addition</li> <li>● As a reference for connections and considerations, use the Developing Understanding and Fluency model in Math in Practice Module 3, pgs. 62-66</li> </ul>	<ul style="list-style-type: none"> <li>● Engage in turn and talks or whole class discussions of the essential understandings and essential questions</li> <li>● Students will be able to show and express their thinking in multiple ways</li> <li>● Students will reinforce rounding by playing game: Build and Round It (Math in Practice Module 5, pg. 140)</li> <li>● Students will reinforce addition fluency by participating in: Talk About It/Write About It (Math in Practice, Module 6, pg. 169) Students will use mental computation to estimate and determine if the sum is over or under 700. Students explain and defend their reasoning.</li> <li>● Describe and justify understandings with drawings, diagrams, or other representations</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li> <li>● DOK Level 3</li> <li>● DOK Level 2</li> <li>● DOK Level 2, 3</li> <li>● DOK Level 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Use concrete, visual/pictorial, and abstract models to support and scaffold students’ understanding of methods</li> <li>● Ask students to discuss and explain the</li> </ul>	<ul style="list-style-type: none"> <li>● Use manipulatives to show understanding</li> <li>● Reflect on which procedures seem to work best for specific types of problems</li> <li>● Role play different ways of saying, “This is</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> </ul>

<p>procedures they are using to solve problems</p> <ul style="list-style-type: none"> <li>● Connect student strategies and methods to more efficient procedures</li> <li>● Reinforce that confusion and errors are a natural part of learning</li> <li>● Teacher will provide multiple tasks for promoting fluency with fact sets,(beginning on pg. 106) in Math in Practice there are a variety games that reinforce and allow for differentiation and extension of fact sets</li> </ul>	<p>tough and I don't know how to proceed, but I will not give up!"</p> <ul style="list-style-type: none"> <li>● Reinforce students mental math strategies and reasonableness by participating in Over or Under (Math in Practice Module 7, pg. 189)</li> <li>● Reinforce tens patterns to explore multiples of tens by participating in Toasty Toes activity (Math in Practice Module 3, pg 75)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li> <li>● DOK Level 2</li> </ul>
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**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Facilitate discourse by encouraging mathematicians to explain and defend their thinking</li> <li>● Ask questions that require explanation and justification</li> <li>● Consider what counts as evidence of student learning to inform questions, prompts, and scaffolds to use when responding to students</li> <li>● Give students time to struggle and ask questions that scaffold student thinking without doing the work for them</li> <li>● STEM Activity: Provide materials (whiteboard, marker, eraser, base ten blocks), access to technology (tablet or Chromebook), and ample time to create a paper slide video demonstrating their understanding of reading, writing, and showing numbers up to 100,000.</li> </ul>	<ul style="list-style-type: none"> <li>● Explain thinking through writing or classroom discourse</li> <li>● Students will reinforce rounding by challenging themselves by playing game: Rounding Challenge (Math in Practice Module 5, pg. 149)</li> <li>● Students will reinforce rounding and addition fluency by playing game: Pick 8 (Math in Practice Module 6, pg. 170)</li> <li>● Students will reinforce subtraction fluency by challenging themselves by playing game: Find What's Missing (Math in Practice Module 7, pg. 191)</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Help peers without telling the answers or how to solve the problem</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 3, 4</li> <li>● DOK Level 3</li> <li>● DOK Level 3</li> <li>● DOK Level 3</li> <li>● DOK Level 3</li> <li>● DOK Level 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 3rd Grade

**TOPIC:** Number Sense and Operations in Fractions

**CAREER CONNECTION:**

- Advertising, marketing, promotions, public relations, and sales managers, Pharmacists, Chefs, Nurses, Engineers, Electricians, Automotive body and other repairs, Machinists, Welders, Bus drivers

**INSTRUCTIONAL RESOURCES:** Math in Focus, Math in Practice Teaching Third Grade Math

**LITERATURE CONNECTION:**

*Jump, Kangaroo, Jump!* By Stuart Murphy  
*Full House* by Dayle Ann Dodds  
*Ed Emberley's Picture Pie*

**DESCRIPTION:** In this unit, students develop a deeper understanding of fractions. Building with unit fractions is continued in this unit by learning copies of unit fractions can create part of a whole, a whole, and more than a whole. Students learn to compare fractions to familiar benchmarks such as  $\frac{1}{2}$ . And, as their number sense develops students should be able to reason about numbers by, for instance, explaining that  $\frac{5}{8}$  is greater than  $\frac{1}{2}$  because  $\frac{4}{8}$  is equal to  $\frac{1}{2}$  so 5 is more parts than 4 of the 8. Students will also recognize and create equivalent fractions using visual models and a number line.

In second grade, students partitioned circles and rectangles into equal shares (halves, thirds, and fourths).

This unit is setting students up for fourth grade. Next year, students will decompose, compose, add, and subtract fractions by whole numbers. They will generate and recognize equivalent fractions with different denominators. Also, they will compare fractions using benchmarks and create equivalent fractions to compare fractions.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
3.NF.A.1 Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts.	X	
3.NF.A.2 Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole. a. Describe the numerator as representing the number of pieces being considered. b. Describe the denominator as the number of pieces that make the whole.	X	
3.NF.A.3 Represent fractions on a number line. a. Understand the whole is the interval from 0 to 1. b. Understand the whole is partitioned into equal parts. c. Understand a fraction represents the endpoint of the length a given number of partitions from 0.	X	
3.NF.A.4 Demonstrate that two fractions are equivalent if they are the same size, or the same point on a number line.		X
3.NF.A.5 Recognize and generate equivalent fractions using visual models, and justify why the fractions are equivalent.		X
3.NF.A.6 Compare two fractions with the same numerator or denominator using the symbols $>$ , $=$ or $<$ , and justify the solution.		X
3.NF.A.7 Explain why fraction comparisons are only valid when the two fractions refer to the same whole.		X

**Standards of Mathematical Practice Applied in this Topic**

- 2. Reason abstractly and quantitatively
- 3. Construct viable arguments and critique the reasoning of others
- 6. Attend to precision
- 7. Look for and make use of structure

**ENDURING UNDERSTANDINGS:**

- The size of the fractional part is relative to the size of the whole.
- Fractions represent quantities where a whole is divided into equal-sized parts using models, manipulatives, words, and/or number lines
- Fractions represent quantities where a whole is divided into equal-sized parts using models, manipulatives, words, and/or number lines.

**ESSENTIAL QUESTIONS:**

- What is a fraction?
- When will I use fractions?
- What are different interpretations of a fraction?
- What are different ways to compare fractions?
- What do fractions represent?

**REFERENCES/STANDARDS**

Missouri Learning Standards

3.NF.A.1 Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts.  
 3.NF.A.2 Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole. a. Describe the numerator as representing the number of pieces being considered. b. Describe the denominator as the number of pieces that make the whole.

**LEARNING OBJECTIVE #1**

- I can partition a whole into equal parts and name and describe each part of the fraction that I create.

**I KNOW?**

*Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY*

- Partition, equal, whole, numerator, denominator, fraction

**I UNDERSTAND?**

*Concepts; essential truths that give meaning to the topic; ideas that transfer across situations*

- With fractions the whole must be divided into equal parts.
- A numerator is the top number of a fraction and tells how many parts of the whole you have.
- A denominator is the bottom number of a fraction and it tells how many parts are divided.
- Fractions can be used to represent numbers equal to, less than, or greater than 1.

**I CAN?**

*Skills, Products*

- I can partition a whole into equal parts.
- I can identify the numerator and describe why it is the numerator.
- I can identify the denominator and describe why it is the denominator.
- I can express whole numbers as a fraction.

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.NF.A.3 Represent fractions on a number line. a. Understand the whole is the interval from 0 to 1. b. Understand the whole is partitioned into equal parts. c. Understand a fraction represents the endpoint of the length a given number of partitions from 0.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can represent fractions on a number line.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Number line, fractions, equal, whole</li> </ul>	<ul style="list-style-type: none"> <li>The whole is the interval from 0 to 1.</li> <li>The whole is partitioned into equal parts.</li> <li>A fraction represents a point on a number line.</li> </ul>	<ul style="list-style-type: none"> <li>I can show fractions on a number line, divided into equal parts.</li> <li>I can identify the whole on a number line.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	3.NF.A.4 Demonstrate that two fractions are equivalent if they are the same size, or the same point on a number line. 3.NF.A.5 Recognize and generate equivalent fractions using visual models, and justify why the fractions are equivalent.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can recognize equivalent fractions and I can generate equivalent fractions using visual models.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Equivalent, visual model, fractions, number line, generate</li> </ul>	<ul style="list-style-type: none"> <li>Equivalent fractions are the same size.</li> <li>Equivalent fractions are at the same point on a number line.</li> <li>Equivalent fractions refer to the same whole.</li> <li>Equivalent fractions do not have to be the same shape.</li> </ul>	<ul style="list-style-type: none"> <li>Generate equivalent fractions by using visual models.</li> <li>Show equivalent fractions on a number line.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	3.NF.A.6 Compare two fractions with the same numerator or denominator using the symbols $>$ , $=$ or $<$ , and justify the solution. 3.NF.A.7 Explain why fraction comparisons are only valid when the two fractions refer to the same whole.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can compare fractions</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Compare, greater than, less than, equal to, fractions, numerator, denominator</li> </ul>	<ul style="list-style-type: none"> <li>Any whole number can be written as a fraction.</li> <li>The size of the fractional part is relative to the size of the whole.</li> <li>The more fractional parts used to make a whole, the smaller the parts.</li> <li>In order to compare fractions the whole has to be the same size.</li> </ul>	<ul style="list-style-type: none"> <li>Compare unit fractions by reasoning about their size</li> <li>Compare unit fractions with different sized models.</li> <li>I can compare fractions by comparing the shaded parts of models. <math>&lt;</math> means less than and <math>&gt;</math> means greater than.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Performance Events:            Equivalent Fractions - Three Acts Math: <a href="http://www.101qs.com/1223">http://www.101qs.com/1223</a>            Black Box2: Three Acts Math: <a href="http://www.101qs.com/1772">http://www.101qs.com/1772</a>  <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/leapfrog%20fractions.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/leapfrog%20fractions.pdf</a></li> <li>Chapter assessments, Quizzes, Exit Tickets, Observations, Checklists, Self-reflection/ assessment</li> </ul>	<ul style="list-style-type: none"> <li>Formative</li> <li>Both</li> </ul>	<ul style="list-style-type: none"> <li>DOK Level 2 - 3</li> <li>DOK Levels 1 - 4</li> </ul>

<b>LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING</b> <i>Research based instructional strategies</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Number Talks</li> <li>● Use manipulatives</li> <li>● Math Games</li> <li>● Literature connection</li> <li>● STEM- culture and career</li> </ul>	<ul style="list-style-type: none"> <li>● Students will turn and talk, collaborate to show their thinking</li> <li>● Students will be able to show and express their thinking in multiple ways</li> <li>● Students will use manipulatives</li> <li>● Students will reinforce ---- by playing game:</li> <li>● Students will draw ---- to represent this problem</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li> </ul>
<b>HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?</b> <i>Possible Interventions or differentiation strategies</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Small group support</li> <li>● Review prerequisite skills</li> <li>● Reteaching/Model</li> <li>● Extra practice</li> <li>● Manipulatives, graphic organizers</li> <li>● Use "I can" statements</li> </ul>	<ul style="list-style-type: none"> <li>● Math games</li> <li>● Use manipulatives and math tools</li> <li>● Work with partner</li> <li>● Turn and Talks</li> <li>● Self assess and goal set</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 1- 3</li> </ul>
<b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Stem Activity: Novel Engineering;  <a href="https://www.youtube.com/watch?v=XJgHmx8bvWI">https://www.youtube.com/watch?v=XJgHmx8bvWI</a> Whole group, students list the many problems from the story, then work in a small group to choose one of the problems and engineer a solution</li> <li>● Encourage critical thinking-What Doesn't Belong or My Favorite No</li> </ul>	<ul style="list-style-type: none"> <li>● Explain thinking/Number talk</li> <li>● Peer tutor</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Cooperative learning</li> <li>● Compare and contrast varying approaches</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 3 - 4</li> </ul>





**CONTENT AREA:** Mathematics

**COURSE:** 3rd Grade

**TOPIC:** Relationships and Algebraic Thinking

**CAREER CONNECTION:**

- Computer and information systems managers, Real estate brokers and sales agents, Animal care and service workers, Architects, Computer system analysts, Landscapers, Travel agents, Party planners, Cashiers, Customer service representatives

**INSTRUCTIONAL RESOURCES:** Math in Focus; Math in Practice Teaching Third Grade Math

**LITERATURE CONNECTION:**

*Each Orange had 8 Slices* by Paul Giganti Jr.  
*Divide and Ride* by Stuart J. Murphy  
*Underwater Counting* by Jerry Pallotta  
*Eggs and Legs* by Michael Dahl  
*Toasty Toes: Counting by Tens* by Michael Dahl  
*One Hundred Hungry Ants* by Elinor Pinczes  
*Lilly's Purple Plastic Purse* by Kevin Henkes  
*Six-Dinner Sid* by Inga Moore

**DESCRIPTION:** The focus of this unit is to delve deeper into the development of multiplication and division. In this unit, students understand the idea of the distributive property by using larger factors and learning to model and break apart arrays as an efficient strategy. Finding the product of all two one-digit numbers is developing (mastery is not expected until the end of third grade). The relationship between multiplication and division are strengthened here with the expectation that division can be found through a related multiplication problem. Word problems are solved using equal groups, arrays, and measurement quantities along with a letter standing for the unknown quantity. Students are learning to assess the reasonableness of their answer as they move towards proficiency.

In second grade, students used arrays to work with repeated addition with concrete models and pictorial representation. They explored the commutative and associative properties of addition and subtraction. Also, they investigated even numbers as a foundation for multiplicative thinking.

This unit is setting students up for fourth grade. As fourth graders, students will understand multiplicative comparison situations and explore multi-digit multiplication and division. Fourth graders will apply properties in more complex computations, which include using the distributive property in multi-digit multiplication. Also, fourth graders will use an understanding of multiplication and division concepts and basic facts to support their understanding and fluency with multi-digit operations.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
3.RA.A.1 Interpret products of whole numbers.	X	
3.RA.A.2 Interpret quotients of whole numbers.	X	
3.RA.A.3 Describe in words or drawings a problem that illustrates a multiplication or division situation.		X
3.RA.A.4 Use multiplication and division within 100 to solve problems.		X
3.RA.A.5 Determine the unknown number in a multiplication or division equation relating three whole numbers.		X

3.RA.B.6 Apply properties of operations as strategies to multiply and divide.		X
3.RA.C.7 Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers.	X	
3.RA.C.8 Demonstrate fluency with products within 100.	X	
3.RA.D.9 Write and solve two-step problems involving variables using any of the four operations.	X	
3.RA.D.10 Interpret the reasonableness of answers using mental computation and estimation strategies including rounding.		X
3.RA.E.11 Identify arithmetic patterns and explain the patterns using properties of operations.		X

**Standards of Mathematical Practice Applied in this Topic**

1. Make sense of problems and persevere in solving them
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
7. Look for and make use of structure

**ENDURING UNDERSTANDINGS:**

- Multiplication is grouping objects into sets which is a repeated form of addition.
- Division is separating objects into sets which is a repeated form of subtraction.
- Patterns help make predictions and solve problems.
- Multiplication and division are inverse operations; they undo each other.
- Properties of operations will assist in problem-solving situations.
- Modeling multiplication and division problems based upon their problem-solving structure can help in finding solutions.

**ESSENTIAL QUESTIONS:**

- What are the different meanings of multiplication?
- What patterns can be used to find certain multiplication facts?
- What are the different meanings of division?
- How is division related to other operations?
- What are the properties of operations?
- How can an unknown division fact be found by thinking of a related multiplication fact?
- How are addition and multiplication related?
- How can unknown multiplication facts be found using known facts?
- What are the properties of operations?
- What are the standard procedures for adding and subtracting whole numbers?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.RA.A.1 Interpret products of whole numbers. 3.RA.A.2 Interpret quotients of whole numbers. 3.RA.A.4 Use multiplication and division within 100 to solve problems. 3.RA.A.3 Describe in words or drawings a problem that illustrates a multiplication or division situation.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can find the products of whole numbers 0-10.</li> <li>● I can find the quotients of whole numbers with factors within 10.</li> <li>● I can use multiplication and division within 100 to solve problems.</li> <li>● I can describe in words or drawings a problem that illustrates a multiplication or division situation.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Multiply, factor, product, equal groups of, quotient, divisor, dividend, divide, equally share, number of groups, size of group, unknown, total, represent, array, groups of, model, represent, illustrate, number line, set, area model, tape diagram, equation, repeated addition, expression, multiple,</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication means “equal groups of”</li> <li>● Factors are multiplied together to get a product</li> <li>● Divide can mean “split into equal groups”</li> <li>● Divide can mean “split into groups of”</li> <li>● Multiplication and division can be represented using different pictures and situations</li> <li>● Multiplication and division equations are more efficient ways to solve repeated addition/ subtraction problems</li> </ul>	<ul style="list-style-type: none"> <li>● Find products of whole numbers with factors 0-10</li> <li>● Find quotients of whole numbers</li> <li>● Draw a picture that matches a multiplication or division equation</li> <li>● Describe or draw a situation that matches a multiplication or division equation</li> <li>● Write a multiplication or division equation that matches a picture or situation</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.RA.A.5 Determine the unknown number in a multiplication or division equation relating three whole numbers. 3.RA.B.6 Apply properties of operations as strategies to multiply and divide. 3.RA.C.7 Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers. 3.RA.C.8 Demonstrate fluency with products within 100.
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can determine the unknown number in a multiplication or division equation relating three whole numbers.</li> <li>● I can apply properties of operations as strategies to multiply and divide.</li> <li>● I can multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. I know all products of two one-digit numbers.</li> <li>● I can demonstrate fluency with products within 100.</li> </ul>

<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• number of groups, size of group, unknown, total, fact family, commutative property, distributive property, associative property,</li> </ul>	<ul style="list-style-type: none"> <li>• Division is the inverse of multiplication</li> <li>• Multiplication and division related</li> <li>• Equations can be written in different ways</li> </ul>	<ul style="list-style-type: none"> <li>• Use multiplication problems to solve division problems</li> <li>• Build multiplication and division to solve problems</li> <li>• Explain how multiplication and division are related</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.RA.D.9 Write and solve two-step problems involving variables using any of the four operations. 3.RA.D.10 Interpret the reasonableness of answers using mental computation and estimation strategies including rounding.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can write and solve two-step problems involving variables using any of the four operations.</li> <li>• I can interpret the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Bar diagram, operation, equation, unknown, model, about, approximate, decade number, estimate, exact, midpoint, round</li> </ul>	<ul style="list-style-type: none"> <li>• Which operation makes sense to solve a problem</li> <li>• The story situation and structure</li> <li>• What it means to round a number</li> <li>• How rounding can be used to determine the reasonableness of answers</li> </ul>	<ul style="list-style-type: none"> <li>• I can solve one-step problems</li> <li>• I can solve two-step problems</li> <li>• I can identify when I need to add, subtract, multiply, or divide to solve math word problems</li> <li>• I can create models of math word problems</li> <li>• I can round numbers to the nearest ten</li> <li>• I can round numbers to the nearest hundred</li> <li>• I can use rounding to estimate a sum or difference</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.RA.E.11 Identify arithmetic patterns and explain the patterns using properties of operations.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can identify arithmetic patterns and explain the patterns using properties of operations.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Arithmetic, patterns, even, odd,</li> </ul>	<ul style="list-style-type: none"> <li>There are arithmetic patterns in both addition and multiplication</li> </ul>	<ul style="list-style-type: none"> <li>Identify arithmetic patterns in number charts and addition and multiplication tables</li> <li>Explain the patterns using properties of operations</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Performance Events: <ul style="list-style-type: none"> <li>Houses in a Row <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/houses%20in%20a%20row.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/houses%20in%20a%20row.pdf</a> (I can identify arithmetic patterns and explain the patterns using properties of operations. I can write and solve two-step problems involving variables using any of the four operations.)</li> <li>Boxing the Pots <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/boxing%20the%20pots.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/boxing%20the%20pots.pdf</a> (I can apply properties of operations as strategies to multiply and divide. I can determine the unknown number in a multiplication or division equation relating three whole numbers. I can write and solve two-step problems involving variables using any of the four operations.)</li> <li>The Answer is 36 <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/the%20answer%20is%2036.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/the%20answer%20is%2036.pdf</a> (I can determine the unknown</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Formative</li> </ul>	<ul style="list-style-type: none"> <li>DOK Level 3</li> </ul>

<p>number in a multiplication or division equation relating three whole numbers. I can multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. I know all products of two one-digit numbers.)</p> <ul style="list-style-type: none"> <li>● Set Model for Multiplication (Math in Practice Module 1, pg. 14) Pose a multiplication expression for students to model, write the expression, and solve. Distributed counters to each student.</li> <li>● Number Line to Show Division (Math in Practice Module 1, pg. 36) Ask students to build a number line model, build an equation, and label their answer.</li> <li>● Associative Property (Math in Practice Module 2, pg. 51) Ask students to demonstrate an understanding of the associative property by showing two ways to find the product for a combination of three factors.</li> <li>● Distributive Property (Math in Practice Module 2, pg. 57) Ask students to show their understanding of the distributive property by explaining that factors can be split into two parts and the products of both parts then added together.</li> <li>● Teacher Observations (Math in Practice Module 3, pg 112) or Math Running Records to observe student thinking while fluently working with numbers. Math in Practice offers considerations for each factset and connections that students and teachers should be making while learning and teaching these fast sets.</li> <li>● Two-Step Problems Teacher observations (Math in Practice Module 4, pg 132) Pose a two-step problem and have students share what they know, what they are trying to find out, and what they need to know to figure out the answer.</li> <li>● Chapter assessments, Quizzes, Exit Tickets, Observations, Checklists, Self-reflection/ assessment</li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Level 3</li> <li>● DOK Level 2</li> <li>● DOK Level 3</li> <li>● DOK Level 1-4</li> </ul>
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**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce topics by using essential questions to facilitate class conversation</li> <li>● Use “ I Can” statements to establish and articulate goals for learning</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Facilitate discourse by encouraging mathematicians to explain and defend their thinking</li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Ask students to make math drawings to explain their thinking</li> <li>● As a reference for connections and considerations, use the Developing Understanding and Fluency model in Math in Practice Module 3, pgs. 62-66</li> </ul>	<ul style="list-style-type: none"> <li>● Engage in turn and talks or whole class discussions of the essential understandings and essential questions</li> <li>● Self assess and monitor their own understanding and progress toward the learning objectives</li> <li>● Seek to understand the strategies and approaches of peers by asking questions, trying their way, and describing their way</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Use manipulatives to show understanding. Plates and Counters Activity-Practice writing multiplication equations and creating models with paper plates and counters (Math in Practice Module 1, pg.16)</li> <li>● Describe and justify understandings with drawings, diagrams, or other representations. Each Orange Had 8 Slices Activity- Students draw pictures to represent the multiplication situations in the story. (Math in Practice Module 1, pg. 17)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 2 - 4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?***Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Small group support</li> <li>● Review prerequisite skills</li> <li>● Reteaching/Model</li> <li>● Extra practice</li> <li>● Manipulatives, graphic organizers</li> <li>● Use “I can” statements</li> </ul>	<ul style="list-style-type: none"> <li>● Math games</li> <li>● Use manipulatives and math tools</li> <li>● Work with partner</li> <li>● Turn and Talks</li> <li>● Self assess and goal set</li> </ul>	<ul style="list-style-type: none"> <li>● DOK 1 - 2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?***Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Stem activity: Students use tablets or Chromebooks to create a short video of themselves creating a visual model or a two-step word problems and justifying their answer</li> <li>● Encourage critical thinking-What Doesn't Belong or My Favorite No</li> </ul>	<ul style="list-style-type: none"> <li>● Explain thinking/Number talk</li> <li>● Peer tutor</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Cooperative learning</li> <li>● Compare and contrast varying approaches</li> </ul>	DOK 3 - 4





**CONTENT AREA:** Mathematics

**COURSE:** 3rd Grade

**TOPIC:** Geometry and Measurement

**CAREER CONNECTIONS:**

- Engineers, Architects, Surveyors, Cartographers, Carpenters, Scientists

**INSTRUCTIONAL RESOURCES:** Math in Focus, Math in Practice Teaching Third Grade Math

**LITERATURE CONNECTION:**

*Pigs on a Blanket* by Amy Axelrod  
*Game Time* by Stuart Murphy  
*Hershey's Milk Chocolate Weight and Measures Book* by Jerry Pollotta  
*Measuring Penny* by Loreen Leedy  
*Zachary Zormer: Shape-Transformer* by David Hohn  
*The Greedy Triangle* by Marilyn Burns  
*Chickens on the Move* by Meg Belviso and Pam Pollock  
*Spaghetti and Meatballs for All* by Marilyn Burns

**DESCRIPTION:** In this unit, the students will tell time to the nearest minute and represent time intervals on a number line. They will measure and estimate liquid volumes using liters and masses of objects in units of grams and kilograms. Students will transfer their knowledge to solve word problems involving time, liquid volumes, and mass. Third graders will be finding the area of rectangular areas, decomposing shapes to find area of irregular figures, and use area models for multiplication.

In second grade students partitioned rectangles into rows and columns of squares and used repeated addition to find totals. They also solved problems with linear measurement and worked on telling time to the nearest five minutes.

This unit is setting students up for fourth grade. Next year, student will have to solve problems with elapsed time and convert from one unit of time to another. They will also solve measurement problems that involve time, distance, volume, mass, and money and be introduced to unit conversions. Fourth grade students are also expected to solve more complex problems in which the area and side length are known, but the other side length is not known.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
3.GM.A.1 Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category.		X
3.GM.A.1 Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories.	X	
3.GM.A.1 Partition shapes into parts with equal areas, and express the area of each part as a unit fraction of the whole.		X
3.GM.B.4 Tell and write time to the nearest minute.		X
3.GM.B.5 Estimate time intervals in minutes.	X	
3.GM.B.6 Solve problems involving addition and subtraction of minutes.		X

3.GM.B.7 Measure or estimate length, liquid volume and weight of objects.		X
3.GM.B.8 Use the four operations to solve problems involving lengths, liquid volumes or weights given in the same units.		X
3.GM.C.9 Calculate area by using unit squares to cover a plane figure with no gaps or overlaps.	X	
3.GM.C.10 Label area measurements with squared units.		X
3.GM.C.11 Demonstrate that tiling a rectangle to find the area and multiplying the side lengths result in the same value.	X	
3.GM.C.12 Multiply whole-number side lengths to solve problems involving the area of rectangles.	X	
3.GM.C.13 Find rectangular arrangements that can be formed for a given area.		X
3.GM.C.14 Decompose a rectangle into smaller rectangles to find the area of the original rectangle.		X
3.GM.D.15 Solve problems involving perimeters of polygons.		X
3.GM.D.16 Understand that rectangles can have equal perimeters but different areas, or rectangles can have equal areas but different perimeters.		X

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Time can be measured.</li> <li>● Standard units provide common language for communicating measurements.</li> <li>● Equivalent periods of units are used to measure time.</li> <li>● Some attributes of objects can be measured using standardized units.</li> <li>● The unit of measure chosen depends on what is being measured.</li> <li>● Area and multiplication are related.</li> <li>● Perimeter and area are related.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How can lengths of time be measured and found?</li> <li>● Why is it important to have standardized units of measure?</li> <li>● How do various units of time relate to each other?</li> <li>● What attributes of an object can be measured?</li> <li>● What unit of measure would be best to use in a given situation?</li> <li>● How can understanding the relationship between multiplication and area aid in problem solving?</li> <li>● How are area and perimeter related?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.GM.A.1 Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. 3.GM.A.1 Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I understand that shapes in different categories might share attributes and that they may belong to a larger category. I understand that rhombuses and rectangles are examples of quadrilaterals and there are some quadrilaterals that do not belong to these categories.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Attribute, shape, polygon, two dimensional, side, length, angle, vertex, parallel lines, right angles, equal sides, rhombus, rectangle, quadrilateral, triangle, pentagon, hexagon, octagon, square</li> </ul>	<ul style="list-style-type: none"> <li>Shapes have attributes such as number of sides, equal sides, parallel lines, and right angles.</li> <li>Shapes can be described based on their attributes.</li> <li>Shapes are classified by their attributes.</li> <li>Shapes are named by their number of sides</li> <li>Quadrilaterals are classified into subcategories of rhombuses, rectangles, or squares.</li> <li>Quadrilaterals can be, but do not have to be a rhombus or a rectangle.</li> </ul>	<ul style="list-style-type: none"> <li>Identify shapes with attributes, like number of sides, equal sides, parallel lines, or right angles</li> <li>Describe shapes based on their attributes</li> <li>Classify shapes into categories based on attributes.</li> <li>Name shapes as quadrilateral, triangle, pentagon, hexagon, or octagon based on their number of sides.</li> <li>Classify quadrilaterals into subcategories of rhombuses, rectangles, or squares.</li> <li>Draw shapes that belong in categories and shapes that do not belong to either category.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.GM.A.1 Partition shapes into parts with equal areas, and express the area of each part as a unit fraction of the whole.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can partition shapes into equal shares and express each share as a unit fraction.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Unit fraction, whole, part, partition, equal share</li> </ul>	<ul style="list-style-type: none"> <li>Any shape can be partitioned into equal parts</li> <li>Unit fractions are named by how many parts are in the whole</li> <li>Fractions must have equal areas</li> </ul>	<ul style="list-style-type: none"> <li>Partition shapes into equal shares</li> <li>Name unit fractions</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	3.GM.B.4 Tell and write time to the nearest minute. 3.GM.B.5 Estimate time intervals in minutes. 3.GM.B.6 Solve problems involving addition and subtraction of minutes.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can tell and write time.</li> <li>• I can estimate the length of time activities will take in minutes.</li> <li>• I can solve word problems by adding or subtracting minutes.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Time, estimate, hours, minutes, seconds, elapsed, interval, before, after, later,</li> </ul>	<ul style="list-style-type: none"> <li>• Time can be shown on an analogue clock or a digit clock.</li> <li>• There are 60 minutes in an hour and 60 seconds in a minute.</li> <li>• Word problems involving time can be solved using number lines, counting on, or other strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• Write the time to the nearest minute from an analogue clock.</li> <li>• Draw in the hands on an analogue clock to show a given time.</li> <li>• Estimate how many minutes something will take.</li> <li>• Find the interval given a start and end time.</li> <li>• Find a start or end time given an interval.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	3.GM.B.7 Measure or estimate length, liquid volume and weight of objects. 3.GM.B.8 Use the four operations to solve problems involving lengths, liquid volumes or weights given in the same units.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>• I can measure and estimate length, liquid volume, and weight. I can solve problems involving measurement in the same unit using addition, subtraction, multiplication, or division.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Length, inch, centimeter, meter, foot, unit, standard unit, metric, weight, liter, milliliter, gram, kilogram, volume, estimate, ruler, beaker</li> </ul>	<ul style="list-style-type: none"> <li>• Different units are appropriate for different situations.</li> <li>• Different tools can be used to find length, weight, and volume.</li> <li>• Estimates can help one choose appropriate units for lengths, volume, and weight.</li> </ul>	<ul style="list-style-type: none"> <li>• Measure lengths using appropriate units.</li> <li>• Draw lines to a given length using a ruler.</li> <li>• Measure volume and weight using appropriate units.</li> <li>• Estimate lengths, volume, and weight and choose appropriate units.</li> <li>• Solve word problems involving measurement in the same unit using all four operations.</li> </ul>

<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standard</p>	<p>3.GM.C.9 Calculate area by using unit squares to cover a plane figure with no gaps or overlaps.  3.GM.C.10 Label area measurements with squared units.  3.GM.C.11 Demonstrate that tiling a rectangle to find the area and multiplying the side lengths result in the same value.  3.GM.C.12 Multiply whole-number side lengths to solve problems involving the area of rectangles.  3.GM.C.13 Find rectangular arrangements that can be formed for a given area.  3.GM.C.14 Decompose a rectangle into smaller rectangles to find the area of the original rectangle.</p>	
<p><b>LEARNING OBJECTIVE #3</b></p>	<ul style="list-style-type: none"> <li>● I can calculate area by using unit squares to cover a plane figure with no gaps or overlaps.</li> <li>● I can label area measurements with units squared.</li> <li>● I can demonstrate that tiling a rectangle to find the area and multiplying the side lengths will have the same value.</li> <li>● I can multiply side lengths to find the area of rectangles.</li> <li>● I can find the rectangles that can be formed with a given area.</li> <li>● I can decompose a rectangle into smaller rectangles to find the area of the whole.</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Area, units squares, side length, decompose</li> </ul>	<ul style="list-style-type: none"> <li>● Area means the number of unit squares that can cover a figure with no gaps or overlaps</li> <li>● Area of a rectangle can be found by multiplying side lengths</li> <li>● Different rectangles can have the same area</li> <li>● The area of a rectangle can be found by decomposing it into smaller rectangles and adding the area of those rectangles together</li> </ul>	<ul style="list-style-type: none"> <li>● Find the area of a shape by using unit squares</li> <li>● Find the area of a rectangle by multiplying the side lengths</li> <li>● Form different rectangles with the same area</li> <li>● Decompose a rectangle into smaller rectangles</li> <li>● Find the area of smaller rectangles and add them together to find the area of the whole rectangle</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	3.GM.D.15 Solve problems involving perimeters of polygons. 3.GM.D.16 Understand that rectangles can have equal perimeters but different areas, or rectangles can have equal areas but different perimeters.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>● I can solve problems involving perimeters of polygons.</li> <li>● I can understand that area and perimeters of rectangles do not have to be equal.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Area, perimeter, side lengths</li> </ul>	<ul style="list-style-type: none"> <li>● Perimeter means the length around the outside of a polygon</li> <li>● Perimeter can be found by adding up the side lengths</li> <li>● Perimeters and areas of rectangles do not have to be equal</li> </ul>	<ul style="list-style-type: none"> <li>● Find the perimeter of a polygon given its side lengths</li> <li>● Find the missing side lengths given a polygon's perimeter and other side lengths</li> <li>● Find the area and perimeter of a shape and compare the two</li> <li>● Compare the perimeters of two or more polygons</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> <b>Performance task or other evidence</b> <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Teacher observations (Math in Practice Module 11, pg 246)</li> <li>● Pose prompts for students to respond to in writing (Math in Practice Module 12, pg 262)</li> <li>● Performance Events:               <ul style="list-style-type: none"> <li>○ Which Shape: <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/which%20shape.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/which%20shape.pdf</a></li> <li>○ City Farmers: <a href="http://schools.nyc.gov/NR/ronlyres/CD824F33-84DA-4D5F-8D4A-B450EA8C8000/0/NYCDOE_G3_Math_CityFarmers_Final.pdf">http://schools.nyc.gov/NR/ronlyres/CD824F33-84DA-4D5F-8D4A-B450EA8C8000/0/NYCDOE_G3_Math_CityFarmers_Final.pdf</a></li> <li>○ Fun on the Farm: <a href="http://ccsmathactivities.com/wp-content/uploads/2015/10/G3-Fun-On-The-Farm.pdf">http://ccsmathactivities.com/wp-content/uploads/2015/10/G3-Fun-On-The-Farm.pdf</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Formative</li>   <li>● Formative</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li> <li>● DOK Level 2</li>   <li>● DOK Level 3</li> </ul>

<ul style="list-style-type: none"> <li>○ Lashelle’s Garden: <a href="http://ccssmathactivities.com/wp-content/uploads/2015/10/G3-Lashelles-Garden.pdf">http://ccssmathactivities.com/wp-content/uploads/2015/10/G3-Lashelles-Garden.pdf</a></li> <li>○ Tile Mural: <a href="http://ccssmathactivities.com/wp-content/uploads/2015/10/G3-Tile-Mural.pdf">http://ccssmathactivities.com/wp-content/uploads/2015/10/G3-Tile-Mural.pdf</a></li> <li>● Give students objects to measure and observe students as they work (Math in Practice Module 13, pg 289)</li> <li>● Give students grid paper and ask them to draw two different rectangles that have an area of ____ squared centimeters (Math in Practice Module 14, pg. 301)</li> <li>● Pose perimeter questions where students have to find the length of the missing side (Math in Practice Module 15, pg 318-319)</li> <li>● Create a t-chart with heading quadrilaterals and not quadrilaterals. Have students draw four shapes under each heading and explain how they know (Math in Practice Module 16, pg 332-333)</li> <li>● Chapter assessments, Quizzes, Exit Tickets, Observations, Checklists, Self-reflection/assessment</li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Formative</li> <li>● Both</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2</li> <li>● DOK Levels 2,3</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> <li>● DOK Levels 1-4</li> </ul>
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<b>LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING</b> <i>Research based instructional strategies</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce topic by using essential questions to facilitate class conversation</li> <li>● Support students in exploring tasks without taking over student thinking</li> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Provide students with opportunities to use their own reasoning strategies and methods</li> </ul>	<ul style="list-style-type: none"> <li>● Engage students in turn and talks or whole class discussions of the essential understandings and essential questions</li> <li>● Students will be able to show and express their thinking in multiple ways</li> <li>● Students will reinforce their understanding of area by playing game: Cover the Grid (Math in Practice Module 14, pg. 302)</li> <li>● Students will reinforce their understanding of measurement by creating Measurement</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 3</li> <li>● DOK Level 3</li> <li>● DOK Level 2</li> <li>● DOK Level 2</li> </ul>

for solving problems	<p>Collages (Math in Practice Module 12, pg 271)</p> <ul style="list-style-type: none"> <li>Describe and justify understandings with drawings, diagrams, or other representations.</li> <li>Demonstrate flexible use of strategies and method</li> <li>Reflect on which procedures seem to work best for specific types of problems</li> </ul>	<ul style="list-style-type: none"> <li>DOK Level 3</li> <li>DOK Level 3</li> <li>DOK Level 3</li> </ul>
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Connect student strategies and methods to more efficient procedures</li> <li>Use concrete, visual/pictorial, and abstract models to support and scaffold students' understanding of methods</li> <li>Ask students to discuss and explain the procedures they are using to solve problems</li> <li>Connect student strategies and methods to more efficient procedures</li> <li>Reinforce that confusion and errors are a natural part of learning</li> </ul>	<ul style="list-style-type: none"> <li>Reflect on which procedures seem to work best for specific types of problems</li> <li>Use manipulatives to show understanding - exploring the area of rectangles with square tiles (Math in Practice Module 14 pg. 294)</li> <li>Connecting area to multiplication (Math in Practice Module 14 pg. 298)</li> <li>Role play different ways of saying, "This is tough and I don't know how to proceed, but I will not give up."</li> </ul>	<ul style="list-style-type: none"> <li>DOK Level 2</li> <li>DOK Level 2</li> <li>DOK Level 2</li> <li>DOK Level 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>Facilitate discourse by encouraging mathematicians to explain and defend their thinking</li> <li>Ask questions that require explanation and justification</li> <li>Incorporate a STEM integration activity such</li> </ul>	<ul style="list-style-type: none"> <li>Listen to, comment and questions peers</li> <li>Listen carefully and critique the reasoning of peers respectfully</li> <li>Compare and contrast varying approaches</li> <li>Students will reinforce area by challenging themselves to complete the activity Area</li> </ul>	<ul style="list-style-type: none"> <li>DOK Levels 3, 4</li> </ul>



<p>as novel engineering, studying female scientists, or allowing time for students to practice tiling by creating a video gameboard using Bloxels.</p>	<p>Around the School (Math in Practice Module 14, pg. 303)</p> <ul style="list-style-type: none"><li>● After reading the book <i>Sam's Sneaker Squares</i>, students will act as engineers and design a prototype to solve a problem in the book (Math in Practice Module 14, pg. 302-303).</li><li>● Students will reinforce telling time by challenging themselves to play game Where has the Time Gone? (Math in Practice Module 11, pg 255)</li></ul>	
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**CONTENT AREA:** Mathematics

**COURSE:** 3rd Grade

**TOPIC:** Data & Statistics

**CAREER CONNECTION:**

- Meteorologist, Journalist, Pilot, Investors, Scientist, Financial Planners, Personal Trainer

**INSTRUCTIONAL RESOURCES:** Math in Focus, Math in Practice Teaching Third Grade Math

**LITERATURE CONNECTION:**

*Lemonade for Sale* by Stuart J. Murphy  
*Tiger Math* by Ann Whitehead  
*Graphs* by Bonnie Bader and Mernie Cole  
*The Great Graph* by Loreen Leedy

**DESCRIPTION:** In this unit students will represent, interpret, and answer questions about data using a picture graph, bar graph, and line plot. Students will transfer their knowledge to solve word problems involving a variety of graphs.

In second grade students had to create and interpret bar and picture graphs with single-unit scales. They also had to create line plots to whole units.

This unit is setting students up for fourth grade. Next year, students will continue to analyze variety of graphs. They will be asked to solve problems involving addition and subtraction by using information presented in a data display.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Topic	PRIORITY	SUPPORTING
3.DS.A.1 Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories.		X
3.DS.A.2 Solve one- and two-step problems using information presented in bar and/or picture graphs.	X	
3.DS.A.3 Create a line plot to represent data.		X
3.DS.A.4 Use data shown in a line plot to answer questions.	X	

**Standards of Mathematical Practice Applied in this Topic**

- 2. Reason abstractly and quantitatively
- 5. Use appropriate tools strategically
- 6. Attend to precision
- 7. Look for and make use of structure

**ENDURING UNDERSTANDINGS:**

- Construct a frequency table to represent a collection of data
- Identify the parts of pictographs, bar graphs, and line plots
- Display data in pictographs, bar graphs, and line plots
- Read and interpret data in bar graphs, pictographs, and line plots

**ESSENTIAL QUESTIONS:**

- How can I use the data I have to create a graph?
- What are the parts of pictographs, bar graphs, and line plots?
- What are some ways to represent data?
- What are some thoughts and predictions I have after reading my graph?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.DS.A.1 Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories. 3.DS.A.2 Solve one- and two-step problems using information presented in bar and/or picture graphs.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>● I can create picture graphs and bar graphs to display data.</li> <li>● I can solve problems on various graphs.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● survey, tally, table, display, title, label, bar graph, picture graph/pictograph, key, scale, horizontal/ row, vertical/ column</li> </ul>	<ul style="list-style-type: none"> <li>● That data can be collected by asking a questions and recording the results.</li> <li>● That data can be displayed and organized in a variety of ways and graphs.</li> <li>● That parts of the graph dictate what the graph is telling me.</li> <li>● That displayed data can allow me to see data more clearly and allow me to draw conclusions.</li> <li>● That data can help me solve problems, make predictions, and find patterns.</li> </ul>	<ul style="list-style-type: none"> <li>● I can collect data by asking a question and recording the data.</li> <li>● I can create a variety of graphs, including picture graphs and bar graphs.</li> <li>● I can create a graph to scale.</li> <li>● I can read the different parts of the graph and understand what they are telling me.</li> <li>● I can read data on a graph and make predictions.</li> <li>● I can analyze data to problem solve.</li> <li>● I can answer data questions such as “how many more” and “how many less.”</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	3.DS.A.3 Create a line plot to represent data. 3.DS.A.4 Use data shown in a line plot to answer questions.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>● I can create a line plot to display data.</li> <li>● I can solve problems using the data in a line plot.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● tally, table, display, title, label, line plot, key, scale, horizontal/ row, vertical/ column</li> </ul>	<ul style="list-style-type: none"> <li>● That a line plot is another way of displaying and organizing data.</li> <li>● That line plots are used often to show a collection of measurement data (whole numbers, <math>\frac{1}{2}</math> inch, and <math>\frac{1}{4}</math> inch).</li> </ul>	<ul style="list-style-type: none"> <li>● I can collect data by asking a question and recording the data.</li> <li>● I can create a line plot.</li> <li>● I can see the connection between line plots and fraction number lines.</li> </ul>

	<ul style="list-style-type: none"> <li>• That line plots and fraction number lines are connected.</li> <li>• That parts of the graph dictate what the graph is telling me.</li> <li>• That displayed data can allow me to see data more clearly and allow me to draw conclusions.</li> <li>• That data can help me solve problems, make predictions, and find patterns.</li> </ul>	<ul style="list-style-type: none"> <li>• I can create a line plot to scale.</li> <li>• I can read the different parts of the graph and understand what they are telling me.</li> <li>• I can read data on a graph and make predictions.</li> <li>• I can analyze data to problem solve.</li> <li>• I can answer data questions such as “how many more” and “how many less.”</li> </ul>
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**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b></p> <p align="center"><b>Performance task or other evidence</b></p> <p align="center"><b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b></p> <p align="center">(1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>• Performance Events: <ul style="list-style-type: none"> <li>○ Parking Cars <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/parking%20cars.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/parking%20cars.pdf</a> (I can create picture graphs and bar graphs to display data. I can solve problems on various graphs.)</li> </ul> </li> <li>• Pose the Creating Graphs assessment from Math in Practice (Module 13, pg. 284) Students will create a scaled bar graph or picture graph to represent the data in the frequency table. Teachers will observe if students select an appropriate scale and correctly indicate the data that falls between the numbers on their scale.</li> <li>• Talk About it/Write About It (Math in Practice, Module 13, pg. 285) students will be asked to describe the importance and purpose of a key in picture graphs.</li> <li>• Show students a variety of lines, ask them to measure these lines to then create a line plot to show the data (Math in Practice, Module 13 pg. 289)</li> <li>• Chapter assessments, Quizzes, Exit Tickets, Observations, Checklists, Self-reflection/assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Formative</li> <li>• Formative</li> <li>• Formative</li> <li>• Formative</li> <li>• Both</li> </ul>	<ul style="list-style-type: none"> <li>• DOK Levels 2,3</li> <li>• DOK Level 2</li> <li>• DOK Level 3</li> <li>• DOK Level 2</li> <li>• DOK Levels 1 - 4</li> </ul>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce topics by using essential questions to facilitate class conversation</li> <li>● Advance student understanding by asking questions that build onto student thinking (not take over or funnel),</li> <li>● showing data representations that connect to student’s lives helps them see the usefulness of graphs and analyzing data</li>   <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)                             <ul style="list-style-type: none"> <li>○ Allowing students the time they need to make the connection that a line plot and a ruler are a number line, this connection helps students see the correlation between these number concepts and models (Math in Practice model, Module 13, pg. 275)</li> </ul> </li> <li>● Teacher will allow students to practice adjusting their graphs to different scales, (Math in Practice, Module 13 pg. 279)</li> </ul>	<ul style="list-style-type: none"> <li>● Engage in turn and talks or whole class discussions of the essential understandings and essential questions</li> <li>● Reflect on and justify reasoning, not simply providing an answer</li> <li>● Tally and Graph activity (Math in Practice, Model 13, pg. 278) promotes students to explore how to a key represents the numeric information</li> <li>● Students will turn and talk, collaborate to understand why people create graphs and collect data (Math in Practice, Thinking Through a Lesson, Module 13, pg. 276)</li> <li>● Students will reinforce creating bar graphs and/or pictographs by playing Grab Two Handfuls (Math in Practice, Module 13 pg. 285) Then have students write various interpretive statements and formulate questions for peer review.</li> <li>● Students will Display Data on a Line Plot (Math in Practice, Module 13 pg 288) by connecting line plot data to measurements of relatable items. Students will present and explain ideas and solutions in pairs, small groups, or whole class.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Level 2,3</li>   <li>● DOK Levels 2 - 4</li>   <li>● DOK Level 2</li>   <li>● DOK Level 2</li>   <li>● DOK Level 2,3</li>   <li>● DOK Level 2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Anticipate what students may struggle with and prepare to support them productively</li> </ul>	<ul style="list-style-type: none"> <li>● Reflect on which procedures seem to work best for specific types of problems</li> <li>● Role play different ways of saying, “This is tough and I don’t know how to proceed, but I will not give up!”</li> <li>● Students can reinforce creating line plots by playing Basket of Stuff (Math in Practice, Module 13, pg 290) the activity allows students to measure, create a line plot, and repeat.</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 1,2</li> <li>● DOK Levels 1,2</li> <li>● DOK Level 2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Facilitate discourse by encouraging mathematicians to explain and defend their thinking</li> <li>● Use “What Doesn’t Belong” to encourage students to think critically</li> <li>● Stem activity: Throughout the topic, students gather science related data of their choice (i.e., weather, precipitation amounts, moon phases, etc.) and create pictographs, bar graphs, or line plots to display the data.</li> </ul>	<ul style="list-style-type: none"> <li>● Seek to understand the strategies and approaches of peers by asking questions, trying their way, and describing their way</li> <li>● Discuss and justify use of a specific strategy with a classmate</li> <li>● Students will work with peers or in a small guided group to think through and analyze Nick’s Caterpillars (Math in Practice, Module 13, pg. 290)</li> </ul>	<ul style="list-style-type: none"> <li>● DOK Levels 3,4</li> </ul>

## **Fourth Grade Curriculum**



**CONTENT AREA:** Mathematics **COURSE:** 4th Grade

**TOPIC:** Number Sense and Operations in Base Ten

**CAREER CONNECTION:** Financial analyst, Air Traffic Controller, Accountant, and Personal Banker

[Weusemath.org](http://www.xpmath.org)  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:**

Math In Focus Singapore Math by Marshall Cavendish  
 Math In Practice by Sammons, O’Connell, SanGiovanni

**LITERATURE CONNECTION:**

*How Much, How Many, How Far, How Heavy, How Long, How Tall is 1,000?* By: Helen Nolan and Tracy Walker  
*Math Curse* By: Jon Scieszka and Lane Smith  
*The Grapes of Math* By: Gregory Tang  
*Math Potatoes* by Greg Tang  
*The Best of Times* by Greg Tang

**DESCRIPTION:** In this topic, students will use place value understanding and properties of operations to perform multi-digit arithmetic with numbers up to one million. (i.e. rounding multi-digit whole numbers, fluency with addition and subtraction of whole numbers, multiply whole numbers 1 digit by 4 digits & 2 digits by 2 digit and justify the solutions, and find whole number quotients and remainders with 4 digit dividends by 1 digit divisor and justify the solution.) In 3rd grade students explored the concept of multiplication, developing fluency with multiplication facts, multiplying by multiples of 10 and explored distributive property. In 4th grade we use place value concepts and properties to multiply 1 digit by multi digit and 2 digit by 2 digit numbers. In 5th grade, students will use this knowledge to multiply decimals.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
4.NBT.A.1 Round multi-digit whole numbers to any place.		X
4.NBT.A.2 Read, write and identify multi-digit whole numbers up to one million using number names, base ten numerals and expanded form		X
4.NBT.A.3 Compare two multi-digit numbers using the symbols $>$ , $=$ or $<$ , and justify solutions		X
4.NBT.A.4 Understand that in a multi-digit whole number, a digit represents 10 times what it would represents in the place to its right.		X
4.NBT.A.5 Demonstrate fluency with addition and subtraction of whole numbers.		X
4.NBT.A.6 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution.	X	
4.NBT.A.7 Find whole-number quotients and remainders with up to four digit dividends and one-digit divisors, and justify the solution.	X	



**Standards of Mathematical Practice Applied in this Topic**

- Make sense of problems and persevere in solving them
- Construct viable arguments and critique the reasoning of others
- Model with mathematics

**ENDURING UNDERSTANDINGS:**

- Rounding Numbers up to one million
- Multiplying four digits by one and two by two digit numbers and justify solution
- Dividing four digit dividends and one digit divisors and justify solution

**ESSENTIAL QUESTIONS:**

- How can I use rounding to help me justify my solutions for multiplication and division?
- How can I use rounding to help me solve multiplication and division problems without a calculator?
- What models can I use to show my understanding of multiplying large numbers?
- What models can I use to show my understanding of dividing large numbers?

**REFERENCES/STANDARDS**

Missouri Learning Standards

- 4.NBT.A.1 Round multi-digit whole numbers to any place.
- 4.NBT.A.2 Read, write and identify multi-digit whole numbers up to one million using number names, base ten numerals and expanded form.
- 4.NBT.A.3 Compare two multi-digit numbers using the symbols  $>$ ,  $=$  or  $<$ , and justify solutions.
- 4.NBT.A.4 Understand that in a multi-digit whole number, a digit represents 10 times what it would represent in the place to its right.
- 4.NBT.A.5 Demonstrate fluency with addition and subtraction of whole numbers.

**LEARNING OBJECTIVE #1**

**Use place value understanding to analyze numbers up to one million**

**I KNOW?**

*Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY*

**I UNDERSTAND?**

*Concepts; essential truths that give meaning to the topic; ideas that transfer across situations*

**I CAN?**

*Skills, Products*

- Compare, digits, estimate, expanded form, place value, round, standard form, word form, properties of operations, equations, illustrations, explanations, arrays, area models, number expression, number sentence

- How to use place value understanding to round multi-digit whole numbers to any place in the context of estimation.
- How to read, write and identify multi-digit whole numbers up to one million using base ten numerals, number names and expanded notation.
- How to compare two multi-digit numbers

- Round multi-digit whole numbers to any place.
- Read, write and identify multi-digit whole numbers up to one million using number names, base ten numerals and expanded form.
- Compare two multi-digit numbers using the symbols  $>$ ,  $=$  or  $<$ , and justify solutions.
- Identify and create a number line
- Explain that a digit represents 10 times what

	<p>up to one million using base ten numerals, number names and expanded notation.</p> <ul style="list-style-type: none"> <li>• Digits in one place represents ten times what it represents in the place to its right.</li> <li>• Fluency with addition and subtraction of whole numbers.</li> </ul>	<p>it represents to its right.</p> <ul style="list-style-type: none"> <li>• Demonstrate fluency with addition and subtraction of whole numbers.</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	<ul style="list-style-type: none"> <li>• 4.NBT.A.6 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, and justify the solution.</li> </ul>	
<b>LEARNING OBJECTIVE #2</b>	<b>Multiply four by one digit whole numbers as well as two by two digit numbers</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Area model, estimate, factor, partial product, product, rectangle model</li> </ul>	<ul style="list-style-type: none"> <li>• How to multiply 1 x 4 digit numbers using strategies of the properties of operations using equations, illustrations and explanations i.e. arrays, area models.</li> </ul>	<ul style="list-style-type: none"> <li>• Multiply a whole number of up to four digits by a one-digit whole number.</li> <li>• Multiply two two-digit numbers, and justify the solution.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	<ul style="list-style-type: none"> <li>• 4.NBT.A.7 Find whole-number quotients and remainders with up to four digit dividends and one-digit divisors, and justify the solution.</li> </ul>	
<b>LEARNING OBJECTIVE #3</b>	<b>Divide four digit dividends and one digit divisors</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Dividend, divisor, partial quotient, quotient, remainder, operations</li> </ul>	<ul style="list-style-type: none"> <li>• How to divide 4 digit x 1 digit numbers using strategies of the properties of operations using equations, illustrations and explanations i.e. arrays, area models.</li> </ul>	<ul style="list-style-type: none"> <li>• Find whole-number quotients and remainders with up to four digit dividends and one-digit divisors, and justify the solution.</li> <li>• Solve division problems using the operations of multiplication, strategies of partials, illustrations that use arrays and/or area models.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● 4th grade place value common assessment</li> <li>● Performance Task: <u>The Baker</u></li> <li>● Observation</li> <li>● Unit Assessment</li> <li>● Exit Slips</li> <li>● Formative Assessment (MIP pages 95, 99, 107)</li> </ul>	Summative Summative  Formative Summative Formative	2, 3, 4 3, 4  1, 2, 3 2,3,4, 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Introduce forms of varied representations that can be useful to students to make mathematical connections (concrete, visual/pictorial, and abstract)</li> <li>● Ask students to make math drawings to explain their thinking</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Connect student strategies and methods to more efficient procedures</li> </ul>	<ul style="list-style-type: none"> <li>● Describe and justify understandings with drawings, diagrams, or other representations</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Use pictorial representations to show understanding</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● Math in Practice modules 2-6</li> </ul>	<ul style="list-style-type: none"> <li>● Place Value: Making Numbers activity pg. 50 (MIP)</li> <li>● Addition/Subtraction: Sums and Differences pg. 86 (MIP)</li> <li>● Base Facts pg. 99 (MIP)</li> <li>● Multiplication: Perfect Placement pg.110 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● STEM Activity -use hyperlink to search various STEM activities</li> <li>● <a href="https://www.stem.org.uk/resources/elibrary/resource/31696/multiplication-makes-sense">https://www.stem.org.uk/resources/elibrary/resource/31696/multiplication-makes-sense</a></li> <li>● Math in Practice modules 2-6</li> </ul>	<ul style="list-style-type: none"> <li>● Place Value: Roll and Round It pg. 69 (MIP)</li> <li>● Addition/Subtraction: Missing Addends pg. 86 (MIP) Challenge problem pg. 87 (MIP)</li> <li>● Multiplication/Division: Remainder Challenge pg. 132 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 3, 4</li> </ul>



**CONTENT AREA:** Mathematics      **COURSE:** 4th Grade  
**CAREER CONNECTION:** Engineers, Researchers, Bakers and Chefs, Seamstresses and Quilters, Architects, Farmers, Mechanics, Pharmacist, Medical Doctors, Health Staff, Realtors, Lenders, Carpenters, Musicians, Stock Traders, Pilots, Athletes  
[Weusemath.org](http://www.xpmath.org)  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)  
**INSTRUCTIONAL RESOURCES:**  
 Math In Focus Singapore Math by Marshall Cavendish  
 Math In Practice by Sammons, O'Connell, SanGiovanni  
**LITERATURE CONNECTION:**  
*The Cookie Fiasco* By: Dan Santat and Mo Willems  
*Full House: An Invitation to Fractions* By: Dayle Ann Dodds

**TOPIC:** Number Sense and Operations in Fractions  
**DESCRIPTION:** Extend understanding of fraction equivalence and ordering (Limit denominators to 2, 3, 4, 5, 6, 8, 10, 12, and 100), operations on whole numbers to fraction operations. (i.e. Add and subtract fractions and mixed numbers with like denominators, Multiply fractions and mixed numbers by a whole number, and Identify and compare decimals up to the hundredths place.) This topic lays the foundation for fifth grade when students apply their understanding of equivalent fractions to add and subtract fractions with unlike denominators.

What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
4.NF.A.1 Explain and/or illustrate why two fractions are equivalent.	X	
4.NF.A.2 Recognize and generate equivalent fractions.	X	
4.NF.A.3 Compare two fractions using the symbols $>$ , $=$ or $<$ , and justify the solution.	X	
4.NF.B.4 Understand addition and subtraction of fractions as joining/composing and separating/decomposing parts referring to the same whole.	X	
4.NF.B.5 Decompose a fraction into a sum of fractions with the same denominator and record each decomposition with an equation and justification	X	
4.NF.B.6 Solve problems involving adding and subtracting fractions and mixed numbers with like denominators.	X	
4.NF.B.7 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	X	
4.NF.B.8 Solve problems involving multiplication of a fraction by a whole number.	X	
4.NF.C.9 Use decimal notation for fractions with denominators of 10 or 100	X	
4.NF.C.10 Understand that fractions and decimals are equivalent representations of the same quantity.	X	
4.NF.C.11 Read, write and identify decimals to the hundredths place using number names, base ten numerals and expanded form.	X	
4.NF.C.12 Compare two decimals to the hundredths place using the symbols $>$ , $=$ or $<$ , and justify the solution.	X	

### Standards of Mathematical Practice Applied in this Unit

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

#### ENDURING UNDERSTANDINGS:

- Add and subtract fractions and mixed numbers with like denominators
- Multiply fractions and mixed numbers by a whole number
- Identify and compare decimals up to the hundredths place

#### ESSENTIAL QUESTIONS:

- How can I use models i.e. open number line, tape diagram, or area model to calculate and compare fractions and decimals.
- How can I use my understanding of fractions and decimals in real life?

#### REFERENCES/STANDARDS

Missouri Learning Standards

- 4.NF.A.1 Explain and/or illustrate why two fractions are equivalent.
- 4.NF.A.2 Recognize and generate equivalent fractions.
- 4.NF.A.3 Compare two fractions using the symbols  $>$ ,  $=$  or  $<$ , and justify the solution.

#### LEARNING OBJECTIVE #1

**Extend understanding of fraction equivalence and ordering**

#### I KNOW?

*Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY*

- numerator
- denominator
- mixed number
- equivalent
- benchmark fraction
- benchmark

#### I UNDERSTAND?

*Concepts; essential truths that give meaning to the topic; ideas that transfer across situations*

- The relationship between a numerator and a denominator.
- Mixed numbers are made of whole number and a fractional number.
- Benchmark fractions are  $0$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and  $1$ .
- Equivalent fraction numerators and denominator have a multiple relationship or pattern.
- How to explain and/or illustrate why two fractions are equivalent.
- How to recognize and generate equivalent fractions.
- How to compare two fractions with different numerators and different denominators and justify the conclusions using a visual mode

#### I CAN?

*Skills, Products*

- Explain and/or illustrate why two fractions are equivalent.
- Recognize and generate equivalent fractions.
- Compare two fractions using the symbols  $>$ ,  $=$  or  $<$ , and justify the solution.

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	<ul style="list-style-type: none"> <li>● 4.NF.B.4 Understand addition and subtraction of fractions as joining/composing and separating/decomposing parts referring</li> <li>● 4.NF.B.5 Decompose a fraction into a sum of fractions with the same denominator and record each decomposition with an equation and justification</li> <li>● 4.NF.B.6 Solve problems involving adding and subtracting fractions and mixed numbers with like denominators.</li> <li>● 4.NF.B.7 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</li> <li>● 4.NF.B.8 Solve problems involving multiplication of a fraction by a whole number.</li> </ul>	
<b>LEARNING OBJECTIVE #2</b>	<b>Extend understanding of operations on whole numbers to fraction operations</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Whole number, numerator, denominator, common denominator, equivalent, decomposing/separating, composing/joining,</li> </ul>	<ul style="list-style-type: none"> <li>● Relationship between whole numbers, numerators, denominators.</li> <li>● Fractions are equal parts of a whole.</li> <li>● Common denominators are equivalent representations.</li> <li>● How to add and subtract fractions as joining/composing and separating/decomposing parts referring to the same whole.</li> <li>● How to decompose a fraction into a sum of fractions with same denominator in multiple ways and justify using number lines, manipulatives, or illustrations.</li> <li>● How to solve problems with adding and subtracting fractions and mixed numbers with like denominators.</li> <li>● How to apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</li> <li>● How to solve word problems involving multiplication of a fraction by a whole number.</li> </ul>	<ul style="list-style-type: none"> <li>● Understand addition and subtraction of fractions as joining/composing and separating/decomposing parts.</li> <li>● Decompose a fraction into a sum of fractions with the same denominator and record each decomposition with an equation and justification.</li> <li>● Add and subtract fractions and mixed numbers with like denominators.</li> <li>● Multiply a fraction by a whole number.</li> <li>● Solve problems involving multiplication of a fraction by a whole number.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	<ul style="list-style-type: none"> <li>● 4.NF.C.9 Use decimal notation for fractions with denominators of 10 or 100.</li> <li>● 4.NF.C.10 Understand that fractions and decimals are equivalent representations of the same quantity.</li> <li>● 4.NF.C.11 Read, write and identify decimals to the hundredths place using number names, base ten numerals and expanded form.</li> <li>● 4.NF.C.12 Compare two decimals to the hundredths place using the symbols <math>&gt;</math>, <math>=</math> or <math>&lt;</math>, and justify the solution.</li> </ul>	
<b>LEARNING OBJECTIVE #3</b>	<b>Understand decimal notation for fractions and compare decimal fractions</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Decimal, decimal point, equivalent, hundredths, tenths, quantity, tenths, hundredths, expanded form, written form</li> </ul>	<ul style="list-style-type: none"> <li>● How to use decimal notation for fractions with denominators of 10 or 100.</li> <li>● That fractions with 10 or 100 and decimals are equivalent representations of the same quantity.</li> <li>● How to read and write decimals to the hundredths place in word, standard and expanded form.</li> <li>● How to compare two decimals to the hundredths place justify conclusions by using number lines, manipulatives or drawings.</li> </ul>	<ul style="list-style-type: none"> <li>● Use decimal notation for fractions with denominators of 10 or 100.</li> <li>● Understand that fractions and decimals are equivalent representations of the same quantity.</li> <li>● Read, write and identify decimals to the hundredths place using number names, base ten numerals and expanded form.</li> <li>● Compare two decimals to the hundredths place using the symbols <math>&gt;</math>, <math>=</math> or <math>&lt;</math>, and justify the solution.</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● 4th Grade Fraction Common Assessment</li> <li>● Performance Task: <u>Leapfrog Fractions</u></li> <li>● Observation</li> <li>● Unit Assessment</li> <li>● Exit Slips</li> </ul>	Summative Summative Formative Summative Formative	2, 3, 4 3, 4 1, 2, 3 2,3,4, 1,2,3



**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Cooperative learning</li> <li>● Vocabulary</li> <li>● Module 7: Exploring Equivalence and Ordering Fractions (Math in Practice)</li> <li>● Unit 6: Fractions and Mixed Numbers</li> <li>● Select tasks that provide multiple entry points through the use of varied tools and representations</li> <li>● Support students in exploring tasks without taking over student thinking</li> <li>● Use “My Favorite No” to encourage students to analyze errors and find solutions</li> <li>● Use “What Doesn’t Belong” to encourage students to think critically</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>● Number talks</li> <li>● Persevere in exploring and reasoning through tasks</li> <li>● Use tools and visual representations to support thinking</li> <li>● Discuss and justify use of a specific strategy with a classmate</li> <li>● Demonstrate flexible use of strategies and method</li> <li>● Reflect on which procedures seem to work best for specific types of problems</li> <li>● Use manipulatives to show understanding</li> <li>● Use pictorial representations to show understanding</li> <li>● Seek to understand the strategies and approaches of peers by asking questions, trying their way, and describing their way</li> <li>● Compare and contrast varying approaches and strategies used by peers</li> <li>● Cooperative learning groups</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● Math in Practice modules 7-10</li> </ul>	<ul style="list-style-type: none"> <li>● Equivalent and ordering fractions: Which is greater? Pg. 152 (MIP)</li> <li>● Adding and subtracting fractions: Matching Fractions pg. 163 (MIP)</li> <li>● Multiplying Fractions: Model on a number line pg. 195 (MIP)</li> <li>● Decimals and Fractions: Making Decimals pg. 214 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● STEM Activity -use hyperlink to search various STEM activities <a href="https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry">https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry</a></li> <li>● Math in Practice modules 7-10</li> </ul>	<ul style="list-style-type: none"> <li>● Equivalent and ordering fractions: Fraction Action pg. 153 (MIP)</li> <li>● Adding and subtracting fractions: Bucket of Problems pg. 181 (MIP)</li> <li>● Multiplying Fractions: Spin a Fraction pg. 197 (MIP)</li> <li>● Decimals and Fractions: Decimal Challenge pg. 217 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 4th Grade

**TOPIC:** Relationships and Algebraic Thinking

**CAREER CONNECTION:**

Math Buddies Math and Science Career Connections

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:**

Math In Focus Singapore Math by Marshall Cavendish

Math In Practice by Sammons, O'Connell, SanGiovanni

**LITERATURE CONNECTION:**

*Two of Everything* By: Lily Toy Hong

*A Remainder of One* By: Elinor Pinczes and Bonnie MacKain

**DESCRIPTION:** Use the four operations with whole numbers to solve problems, work with factors and multiples, and generate and analyze patterns. (i.e. Use the four operations with whole numbers to solve multi step problems, recognize and determine factors, multiples, composite, and prime numbers within 100, and generate and analyze number patterns). This topic prepares students to learn about prime factorization in fifth grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
4.RA.A.1 Multiply or divide to solve problems involving a multiplicative comparison.	X	
4.RA.A.2 Solve multi-step whole number problems involving the four operations and variables and using estimation to interpret the reasonableness of the answer.	X	
4.RA.A.3 Solve whole number division problems involving variables in which remainders need to be interpreted, and justify the solution.	X	
4.RA.B.4 Recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.	X	
4.RA.B.5 Determine if a whole number within 100 is composite or prime, and find all factor pairs for whole numbers within 100.	X	
4.RA.C.6 Generate a number pattern that follows a given rule.		X
4.RA.C.7 Use words or mathematical symbols to express a rule for a given pattern.		X

**Standards of Mathematical Practice Applied in this Unit**

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically

- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

**ENDURING UNDERSTANDINGS:**

- Use the four operations with whole numbers to solve multi step problems
- Recognize and determine factors, multiples, composite, and prime numbers within 100
- Generate and analyze number patterns

**ESSENTIAL QUESTIONS:**

- How can I use numbers and number patterns to help me solve everyday problems?
- What are the relationships between numbers?
- How can I use math to solve everyday problems?

**REFERENCES/STANDARDS**

Missouri Learning Standards

- 4.RA.A.1 Multiply or divide to solve problems involving a multiplicative comparison.
- 4.RA.A.2 Solve multi-step whole number problems involving the four operations and variables and using estimation to interpret the reasonableness of the answer.
- 4.RA.A.3 Solve whole number division problems involving variables in which remainders need to be interpreted, and justify the solution.

**LEARNING OBJECTIVE #1**

**Use the four operations with whole numbers to solve problems**

**I KNOW?**

*Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY*

- Equation, multiple, multiplicative comparison, multiplier, product, times as many as, times as much as, times more than, estimation,

**I UNDERSTAND?**

*Concepts; essential truths that give meaning to the topic; ideas that transfer across situations*

- How to multiply or divide to solve word problems involving multiplicative comparison using and understanding “ \_\_\_\_ times as many”
- How to solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Use estimation to assess reasonableness of answers.
- How to solve whole number division word problems in which remainders need to be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Use estimation to assess reasonableness of answer

**I CAN?**

*Skills, Products*

- Multiply or divide to solve problems involving a multiplicative comparison.
- Solve multi-step whole number problems involving the four operations and variables
- Use estimation to interpret the reasonableness of an answer.
- Solve division problems involving variables in which remainders need to be interpreted, and justify the solution.

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	<ul style="list-style-type: none"> <li>4.RA.B.4 Recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.</li> <li>4.RA.B.5 Determine if a whole number within 100 is composite or prime, and find all factor pairs for whole numbers within 100.</li> </ul>	
<b>LEARNING OBJECTIVE #2</b>	<b>Work with factors and multiples.</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Composite, factor, multiple, prime, product</li> </ul>	<ul style="list-style-type: none"> <li>Numbers are relational to each other and are distinguished by those relationships</li> <li>How to recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number.</li> <li>How to find all factor pairs for whole numbers up to 100. Determine whether a given whole number in the range 1 – 100 is composite or prime.</li> </ul>	<ul style="list-style-type: none"> <li>Recognize that a whole number is a multiple of each of its factors</li> <li>Find the multiples for a given whole number.</li> <li>Determine if a whole number within 100 is composite or prime</li> <li>Find all factor pairs for whole numbers within 100.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	<ul style="list-style-type: none"> <li>4.RA.C.6 Generate a number pattern that follows a given rule.</li> <li>4.RA.C.7 Use words or mathematical symbols to express a rule for a given pattern.</li> </ul>	
<b>LEARNING OBJECTIVE #3</b>	<b>Generate and analyze patterns</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Shape patterns, number patterns, rule</li> </ul>	<ul style="list-style-type: none"> <li>How to generate a number pattern that follows a given rule.</li> <li>How to use words or mathematical symbols to express the rule for a given pattern.</li> </ul>	<ul style="list-style-type: none"> <li>Generate a number pattern that follows a given rule.</li> <li>Use words or mathematical symbols to express a rule for a given pattern.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● 4th Grade Common Assessment</li> <li>● Performance Task: <u>Buttons</u></li> <li>● Observation</li> <li>● Unit Assessment</li> <li>● Exit slips</li> </ul>	Summative Summative Formative Summative Formative	2, 3, 4 3, 4 1, 2, 3 2,3,4, 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Cooperative learning</li> <li>● Vocabulary</li> <li>● Use “I Can” statements to establish and articulate goals for learning</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Ask students to make math drawings to explain their thinking</li> <li>● Select and sequence student approaches and solution strategies for whole class analysis and discussion</li> <li>● Ask intentional questions that math mathematics more visible and accessible</li> <li>● Provide students with opportunities to use their own reasoning strategies and methods for solving problems</li> <li>● Math in Focus Unit 3</li> <li>● Math in Practice Modules 1 &amp; 2</li> </ul>	<ul style="list-style-type: none"> <li>● Engage in turn and talks or whole class discussions of the essential understandings and essential questions</li> <li>● Self assess and monitor their own understanding and progress toward the learning objectives</li> <li>● Use tools and visual representations to support thinking</li> <li>● Discuss and justify use of a specific strategy with a classmate</li> <li>● Describe and justify understandings with drawings, diagrams, or other representations</li> <li>● Compare and contrast varying approaches and strategies used by peers</li> <li>● Cooperative learning groups</li> <li>● Use manipulatives to show understanding</li> <li>● Use pictorial representations to show understanding</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?***Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● Math In Practice Modules 1,2</li> </ul>	<ul style="list-style-type: none"> <li>● Word Problems: Jack and the Beanstalk and Line Segment Problems pg 22-23 (MIP)</li> <li>● Factors, Multiples, and Prime Numbers: Sorting Prime and Composite Numbers, Points for Prime or Composite, Match the condition, and Prime/Composite Flip Book pg 39-41 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?***Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● STEM Activity -use hyperlink to search various STEM activities <a href="https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry">https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry</a></li> <li>● Math in Practice Modules 1,2</li> </ul>	<ul style="list-style-type: none"> <li>● Word Problems: Pass the Basketball Problem and How Many Snowballs pg. 23-24 (MIP)</li> <li>● Factors, Multiples, and Prime Numbers: Goldbach’s Conjecture, Primes on the Hundred Chart pg. 41/42 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 4th Grade

**TOPIC:** Geometry and Measurement

**CAREER CONNECTION:**

Math Buddies Math and Science Career Connections  
Weusemath.org  
[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:**

Math In Focus Singapore Math by Marshall Cavendish  
 Math In Practice by Sammons, O’Connell, SanGiovanni

**LITERATURE CONNECTION:** For Introductions/Interventions to the concepts and to build background knowledge -

*Spaghetti and Meatballs for All!* By: Marilyn Burns and Debbie Tilley

*Is a Blue Whale the Biggest Thing There Is?* By: Robert E. Wells

*Measuring Penny* by Loreen Leedy

*How Long or How Wide* by Brian Cleary

*Millions to Measure* by David Schwartz

<https://www.the-best-childrens-books.org/teaching-graphs.html>

**DESCRIPTION:** Classify 2-dimensional shapes by properties of their lines and angles, understand the concepts of angle and measure angles, and solve problems involving measurement and conversion of measurements from a larger unit to a small unit. (i.e. Identify, estimate, draw, and measure angles; Know and convert measurement units and use the four operations to solve problems related to measurement; Apply area and perimeter formulas for rectangles to solve problems; Construct, classify, dissect, identify, and draw one dimensional and two dimensional shapes). This topic lays the foundation for students to classify shapes within a system in fifth grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
4.GM.A.1 Draw and identify points, lines, line segments, rays, angles, perpendicular lines and parallel lines.	X	
4.GM.A.2 Classify two-dimensional shapes by their sides and/or angles.	X	
4.GM.A.3 Construct lines of symmetry for a two-dimensional figure.		X
4.GM.B.4 Identify and estimate angles and their measure.	X	
4.GM.B.5 Draw and measure angles in whole-number degrees using a protractor.	X	
4.GM.C.6 Know relative sizes of measurement units within one system of units. a. Convert measurements in a larger unit in terms of a smaller unit.		X
4.GM.C.7 Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money.		X
4.GM.C.8 Apply the area and perimeter formulas for rectangles to solve problems.		X



**Standards of Mathematical Practice Applied in this Unit**

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

**ENDURING UNDERSTANDINGS:**

- Identify, estimate, draw, and measure angles
- Know and convert measurement units and use the four operations to solve problems related to measurement
- Apply area and perimeter formulas for rectangles to solve problems
- Construct, classify, dissect, identify, and draw one dimensional and two dimensional shapes

**ESSENTIAL QUESTIONS:**

- How do I use measurement tools and area and perimeter to solve real life problems?
- What geometry patterns and shapes do I see and use in real life?

**REFERENCES/STANDARDS**

Missouri Learning Standards

- 4.GM.A.1 Draw and identify points, lines, line segments, rays, angles, perpendicular lines and parallel lines.
- 4.GM.A.2 Classify two-dimensional shapes by their sides and/or angles.
- 4.GM.A.3 Construct lines of symmetry for a two-dimensional figure.

**LEARNING OBJECTIVE #1**

**Classify 2d shapes by property of their lines and angles**

**I KNOW?**

*Facts, Names, Dates, Places, Information,  
ACADEMIC VOCABULARY*

**I UNDERSTAND?**

*Concepts; essential truths that give meaning to the  
topic; ideas that transfer across situations*

**I CAN?**

*Skills, Products*

- Point, Line, line segment, ray, right, acute, obtuse, angles, perpendicular lines, parallel lines, intersecting, symmetry, polygon, quadrilateral, center line

- How to draw points, lines, line segments, rays, angles (right, acute or obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.
- How to classify two-dimensional shapes by their sides and/or angles (e.g., acute equilateral triangle; if a quadrilateral has

- Draw and identify points, lines, line segments, rays, angles, perpendicular lines and parallel lines.
- Classify two-dimensional shapes by their sides and/or angles.
- Construct lines of symmetry for a two-dimensional figure.

	<p>two pairs of parallel sides it would be classified as a parallelogram).</p> <ul style="list-style-type: none"> <li>• How to identify and construct lines of symmetry for a two-dimensional figure.</li> </ul>	
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	<ul style="list-style-type: none"> <li>• 4.GM.B.4 Identify and estimate angles and their measure.</li> <li>• 4.GM.B.5 Draw and measure angles in whole-number degrees using a protractor.</li> </ul>
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<b>LEARNING OBJECTIVE #2</b>	<b>Understand the concept of angles and measure angles</b>
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<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Protractor, estimate, angle measurement, degrees, acute angle, right angle, obtuse angle, straight angle,</li> </ul>	<ul style="list-style-type: none"> <li>• How to identify and estimate angles and their measure. Understand angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand angles are measured with reference to the degrees of a circle.</li> <li>• How to draw and measure angles in whole-number degrees using a protractor.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and estimate angles and their measure.</li> <li>• Draw and measure angles in whole-number degrees using a protractor.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	<ul style="list-style-type: none"> <li>• 4.GM.C.6 Know relative sizes of measurement units within one system of units. a. Convert measurements in a larger unit in terms of a smaller unit.</li> <li>• 4.GM.C.7 Use the four operations to solve problems involving distances, intervals of time, liquid volume, weight of objects and money.</li> <li>• 4.GM.C.8 Apply the area and perimeter formulas for rectangles to solve problems.</li> </ul>
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<b>LEARNING OBJECTIVE #3</b>	<b>Solve problems involving measurement and conversions of measurements</b>
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<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Convert, distance, time, liquid volume, weight, capacity, area, perimeter, millimeter, centimeter, meter, kilometer, capacity, centigram, centiliter, centimeter,</li> </ul>	<ul style="list-style-type: none"> <li>• Relative sizes of measurement units within one system of units limited to in., ft., yd., km, m, cm; kg, g, lb., oz.; l, ml, pt., qt., gal; hr., min, sec. Within a single system of</li> </ul>	<ul style="list-style-type: none"> <li>• Know relative sizes of measurement units within one system of units. a. Convert measurements in a larger unit in terms of a smaller unit.</li> <li>• Use the four operations to solve problems</li> </ul>

decigram, deciliter, decimeter, elapsed time, foot, gallon, gram, inch, kilogram, liter, mass, meter, milligram, milliliter, millimeter, minute, month, ounce, pound, quart, second, week, yard, year	<p>measurement, express measurements of a larger unit in terms of a smaller unit given the equivalent unit conversion.</p> <ul style="list-style-type: none"> <li>• How to use the four operations to solve word problems involving distances, intervals of time, liquid volume, weight of objects and money, including problems involving simple fractions or decimals.</li> <li>• How to apply the area and perimeter formulas for rectangles in real world and mathematical problems.</li> </ul>	<p>involving distances, intervals of time, liquid volume, weight of objects and money.</p> <ul style="list-style-type: none"> <li>• Apply the area and perimeter formulas for rectangles to solve problems.</li> </ul>
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**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b>	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• 4th Grade Geometry Common Assessment</li> <li>• Performance Task: <u>Quilt Making</u></li> <li>• Observation</li> <li>• Unit Assessment</li> <li>• Exit Slips</li> </ul>	Summative Summative Formative Summative Formative	2, 3, 4 3, 4 1, 2, 3 2,3,4, 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Cooperative learning</li> <li>• Discuss and refer to the essential understandings to ensure that students understand how their learning is progressing</li> </ul>	<ul style="list-style-type: none"> <li>• Number talks</li> <li>• Weekly Measurement tasks</li> <li>• Real-world problems and applications</li> <li>• Demonstrate flexible use of strategies and</li> </ul>	<ul style="list-style-type: none"> <li>• 1, 2, 3, 4</li> </ul>

<ul style="list-style-type: none"> <li>● Use “ I Can” statements to establish and articulate goals for learning</li> <li>● Use graphic organizers, concept attainment maps, and word walls to introduce and reinforce vocabulary</li> <li>● Use “What Doesn’t Belong” to encourage students to think critically</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> <li>● Use manipulatives and other visuals to model</li> <li>● Math in Focus Units 9 - 12</li> <li>● <i>Math In Practice</i> Modules 11, 12, 14</li> </ul>	<p>method</p> <ul style="list-style-type: none"> <li>● Reflect on which procedures seem to work best for specific types of problems</li> <li>● Use manipulatives to show understanding</li> <li>● Explain thinking through writing or classroom discourse</li> <li>● Reflect on misunderstandings</li> <li>● Describe and justify understandings with drawings, diagrams, or other representations</li> <li>● Engage in turn and talks or whole class discussions of the essential understandings and essential questions</li> </ul>	
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**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● <i>Math In Practice</i> Modules 11, 12, 14</li> </ul>	<ul style="list-style-type: none"> <li>● Equivalent Units and Conversion pg. 223/232 <i>Math In Practice</i> (MIP)</li> <li>● Eliminate It, Talk About It/Write About It, Measure Our School, Who Has More pg. 233/234 (MIP)</li> <li>● Problem Solving with Time and Money pg. 235/245 (MIP)</li> <li>● Reviewing Perimeter and Area pg. 250/252 (MIP)</li> <li>● Finding Area and Perimeter Irregular Shapes pg. 264/271 (MIP)</li> <li>● Understanding Lines, Rays, and Angles pg. 294/309</li> <li>● Making Angles/Angle Puzzles/Estimating Degrees pg. 311/312 (MIP)</li> <li>● Exploring Adjacent Angles/Angles are Additive pg. 313/318 (MIP)</li> <li>● Understanding Symmetry pg. 327/330 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 1, 2, 3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● STEM Activity - <a href="https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry">https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry</a></li> <li>● <i>Math In Practice</i> Modules 11, 12, 14</li> </ul>	<ul style="list-style-type: none"> <li>● Pass a Problem pg. 245/246 (MIP)</li> <li>● Talk About It/Write About It pg. 246 (MIP)</li> <li>● Animal Life Spans pg. 246 (MIP)</li> <li>● Pattern Block Area and Perimeter pg. 253/255 (MIP)</li> <li>● Finding Area and Perimeter Irregular Shapes pg. 264/271 (MIP)</li> <li>● Where's the Triangle pg. 321 (MIP)</li> <li>● Type of Triangle Flip Book pg. 322 (MIP)</li> <li>● Classifying Quadrilaterals pg. 324/325 (MIP)</li> <li>● Alphabet Letters/Seeing Symmetry pg. 331 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 4th Grade

**TOPIC:** Data and Statistics

**CAREER CONNECTION:**

Math Buddies Math and Science Career Connections

Weusemath.org

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:**

Math In Focus Singapore Math by Marshall Cavendish

Math In Practice by Sammons, O’Connell, SanGiovanni

**LITERATURE CONNECTION:**

For Introductions/Interventions to the concepts and to build background knowledge -

*Tally O’Malley* by Stuart Murphy

*Lemonade for Sale* by Stuart Murphy

*The Best Vacation Ever* by Stuart Murphy

*Tally Cat Keeps Track* by Trudy Harris

*Tiger Math* by Ann Whitehead Nagda

*Sir Cumference and the Off-the-Charts Dessert* by Cindy

Neuschwander

*Family Reunion* by Bonnie Bader

<https://www.the-best-childrens-books.org/teaching-graphs.html>

**DESCRIPTION:** Represent and analyze data. (i.e. Create, read and analyze data in tables, line plots, bar graphs, and picture graphs and Complete addition and subtraction problems using information presented in graphs). This topic lays the foundation for students to explore line plots with fractions and solve multistep problems based on graphs using all four operations in fifth grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

**Missouri Learning Standards Addressed in this Unit**

**PRIORITY**

**SUPPORTING**

4.DS.A.1 Create a frequency table and/or line plot to display measurement data

X

4.DS.A.2 Solve problems involving addition and subtraction by using information presented in a data display.

X

4.DS.A.3 Analyze the data in a frequency table, line plot, bar graph or picture graph.

X

**Standards of Mathematical Practice Applied in this Unit**

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Create, read and analyze data in tables, line plots, bar graphs, and picture graphs</li> <li>● Complete addition and subtraction problems using information presented in graphs</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How do you use data to communicate and analyze information?</li> <li>● Can you look at data to create statements, make predictions, and ask possible questions?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<ul style="list-style-type: none"> <li>● Create a frequency table and/or line plot to display measurement data</li> <li>● Solve problems involving addition and subtraction by using information presented in a data display.</li> <li>● Analyze the data in a frequency table, line plot, bar graph or picture graph.</li> </ul>	
<p><b>LEARNING OBJECTIVE #1</b></p>	<p><b>Represent and analyze data.</b></p>	
<p><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b></p>	<p><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● frequency table, line plot, bar graph, picture graph, data set and data, axis, cluster, column, intersection, line graph, endpoint, horizontal axis, intervals, key, label, scale, vertical axis, tally chart/table</li> </ul>	<ul style="list-style-type: none"> <li>● How to create a frequency table and/or line plot with the scale marked in whole numbers and/or fractions of a unit (1 2 , 1 4, 1 8 ) to display a data set of measurements.</li> <li>● How to solve problems involving addition and subtraction by using information presented in a data display (e.g., line plot, bar graph, picture graph, frequency table).</li> <li>● How to analyze the data in a frequency table, line plot, bar graph or picture graph to include determining the mode and range.</li> </ul>	<ul style="list-style-type: none"> <li>● Create a frequency table and/or line plot to display measurement data.</li> <li>● Solve problems involving addition and subtraction by using information presented in a data display.</li> <li>● Analyze the data in a frequency table, line plot, bar graph or picture graph.</li> <li>● Identify the mode and range of data presented.</li> </ul>

<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>		
<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● 4th Grade Geometry Common Assessment</li> <li>● Performance Task: <u>Data and Graphs</u></li> <li>● Observation and Exit Slips</li> <li>● Unit Assessment</li> </ul>	Summative Summative Formative Summative	2, 3, 4 3, 4 1, 2, 3 1, 2, 3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Direct Instruction</li> <li>● Student Feedback</li> <li>● Guided Practice</li> <li>● Cooperative learning</li> <li>● Vocabulary</li> <li>● Math In Focus Unit 5</li> <li>● Math in Practice Module 13</li> <li>● Engage students in purposeful sharing of ideas, reasoning, and approaches</li> <li>● Select and sequence student approaches and solution strategies for whole class analysis and discussion</li> <li>● Facilitate discourse by encouraging mathematicians to explain and defend their thinking</li> <li>● Use “Number Talks” to build number relationships to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>● Number talks</li> <li>● Weekly Daily/Weekly Action/Goal Tracking</li> <li>● Real-world problems and applications</li> <li>● Present and explain ideas and solutions in pairs, small groups, or whole class</li> <li>● Listen carefully and critique the reasoning of peers respectfully</li> <li>● Seek to understand the strategies and approaches of peers by asking questions, trying their way, and describing their way</li> <li>● Compare and contrast varying approaches and strategies used by peers</li> <li>● Cooperative learning groups</li> </ul>	<ul style="list-style-type: none"> <li>● 1, 2, 3, 4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> <li>● <i>Math In Practice</i> Modules 13</li> </ul>	<ul style="list-style-type: none"> <li>● Creating Line Plots pg. 276/277 (MIP)</li> <li>● Bar and Picture Graphs pg. 283/287 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 1, 2, 3</li> </ul>



**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● STEM Activity -use hyperlink to search various STEM activities <a href="https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry">https://www.jpl.nasa.gov/edu/teach/tag/search/Geometry</a></li> <li>● <i>Math In Practice</i> Modules 13</li> </ul>	<ul style="list-style-type: none"> <li>● Measure Our Own Wrists pg. 282/283 (MIP)</li> <li>● Using Data from a Line Plot pg. 278/279 (MIP)</li> <li>● Construct A Graph/Mystery Data/Interpret a Bar Graph pg. 287/288 (MIP)</li> </ul>	<ul style="list-style-type: none"> <li>● 3, 4</li> </ul>

## **Fifth Grade Curriculum**



**CONTENT AREA:** Mathematics

**COURSE:** 5th grade

**TOPIC:** Number Sense and Operations Base Ten

**CAREER CONNECTION:**

Science Buddies Math and Science Careers

We Use Math

XP Math

**INSTRUCTIONAL RESOURCES:** Math in Focus and Math in Practice Teaching Fifth Grade Math

**LITERATURE CONNECTION:**

Grapes of Math

Math Appeal

Math for all Season

How Much is A Million

Math Curse

**DESCRIPTION:**

Recognize the directional characteristics of place value, estimate decimals, and uses whole number exponents to denote powers of ten. Uses the four operations to solve problems with whole numbers and decimals and justify the solution. This topic reinforces skills and knowledge needed in sixth grade when students are expected to use decimal place value when working with rational numbers.

What We Want Our Students To Know, Understand, and Be Able to Do		
Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
NBT.A.1 Use place value system understanding to perform operations with multi-digit and decimals to thousandths.	x	
NBT.A.1 Read, write and identify numbers from billions to thousandths using number names, base ten numerals and expanded form.	x	
NBT A. 2 Compare two numbers from billions to thousandths using the symbols $>$ , $=$ or $<$ , and justify the solution.	x	
NBT A.3 Understand that in a multi-digit number, a digit represents $1/10$ times what it would represents in the place to its left.	x	
NBT A 4 Evaluate the value of powers of 10 and understand the relationship to the place value system.	x	
NBT A.5 Round numbers from billions to thousandths place.		x
NBT.A.6 Add and subtract multi-digit whole numbers and decimals to the thousandths place, and justify the solution.		X
NBTA.7 Multiply multi-digit whole numbers and decimals to the hundredths place, and justify the solution.		X
NBTA.8 Divide multi-digit whole numbers and decimals to the hundredths place using up to two-digit divisors and four-digit dividends, and justify the solution.		X
NF.A.1 Understand the relationship between fractions and decimals (denominators that are factors of 100).	x	
Standards of Mathematical Practice Applied in this Unit		

1. Make sense of problems and persevere in solving them.
2. Look for and make use of structures and patterns.
3. Model with mathematics.

**ENDURING UNDERSTANDINGS:**

- A digit in one place represents ten times as much as it represents in the place to its right and  $\frac{1}{10}$  of what it represents in the place to its left.
- Numbers can be identified and composed/decomposed into many forms.
- Numbers have an order and there are numbers between each other.
- Decimal and fractions are related.
- There can be different strategies to solve a problem, but some are more effective and efficient than others are.
- A problem solver understands what has been done, knows why the process was appropriate, and can support it with reasons and evidence.
- The context of a problem determines the reasonableness of a solution.

**ESSENTIAL QUESTIONS:**

- How do digits on a place value chart change their value?
- How many ways can we name and write a number?
- How can we show that there are other numbers between whole numbers?
- Why do we estimate?
- How does explaining my process help me to understand a problem's solution better?
- How do I decide what strategy will work best in a given problem situation?
- How do I know when an answer is reasonable?
- What do I do when I get stuck?

<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>NBT.A.1 Use place value system understanding to perform operations with multi-digit and decimals to thousandths.</p>	
<p><b>LEARNING OBJECTIVE #1</b></p>	<ul style="list-style-type: none"> <li>● I can use the place value system to understand and perform operations with multi-digits and decimals to thousandths.</li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Place</li> <li>● Value</li> <li>● Digit</li> <li>● Period</li> </ul>	<ul style="list-style-type: none"> <li>● In the real world, very large quantities can be represented using hundred thousands, millions, and ten millions.</li> <li>● In the real world, very small quantities and parts of numbers can be represented using decimals (tenths, hundredths).</li> <li>● Problems are solved using appropriate operations.</li> <li>● Estimation can check or see if sums, products, differences, and quotients, are</li> </ul>	<ul style="list-style-type: none"> <li>● I can add and subtract multi-digit numbers to the thousandths place.</li> <li>● I can multiply and divide multi-digit numbers to the thousandths place.</li> <li>● I can use estimation to find reasonableness of a solution.</li> <li>● I can use various problem solving strategies, including model drawing, estimation, guess and check.</li> </ul>

	reasonable.	
<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	NBA.A.1. Read, write and identify numbers from billions to thousandths using number names, base ten numbers and expanded form.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can read, write and identify numbers from billions to thousandths using number names, base ten numbers and expanded form.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Standard form/base ten</li> <li>Exponents</li> <li>Periods</li> <li>Expanded form</li> </ul>	<ul style="list-style-type: none"> <li>Numbers can be written in different forms and mean the same thing.</li> <li>The place of a digit determines its value.</li> <li>There are numbers between whole numbers that represent parts of numbers.</li> </ul>	<ul style="list-style-type: none"> <li>I can read and write numbers up to the billions place and decimals to the thousandths place in standard form, expanded form, and written form.</li> <li>I can locate numbers on a number line. I can rewrite decimals as fractions and mixed numbers in simplest form.</li> </ul>
<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT A. 2 Compare two numbers from billions to thousandths using the symbols $>$ , $=$ or $<$ , and justify the solution.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can compare two numbers from billions to thousandths using the symbols <math>&gt;</math>, <math>=</math> or <math>&lt;</math>, and justify the solution.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Greater than</li> <li>Less than</li> <li>Equal to</li> </ul>	<ul style="list-style-type: none"> <li>That numbers have different values and can be greater than, less than or equal to other numbers depending on where digits are placed within a number.</li> <li>That explaining of justifying my solution helps me understand the process of comparing numbers.</li> </ul>	<ul style="list-style-type: none"> <li>I can compare and order numbers though the billions.</li> <li>I can compare numbers on the number line.</li> <li>I can relate the size of a decimal numbers to common benchmarks, such a 0, 0.5 (0.50 and 0.500), and 1.</li> </ul>
<b>REFERENCES/STANDARDS</b>	NBT A.3 Understand that in a multi-digit number, a digit represents $1/10$ times what it would represents	

Missouri Learning Standard	in the place to its left.	
<b>LEARNING OBJECTIVE #4</b>	<ul style="list-style-type: none"> <li>I can understand that in a multi-digit number, a digit represents 1/10 times what it would represent in the place to its left.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Value</li> <li>Place</li> <li>Multiply</li> <li>Divide</li> <li>digit</li> </ul>	<ul style="list-style-type: none"> <li>Digits in a number have different values depending on where they are placed within that number.</li> <li>Digits to the left of another digit will have greater value.</li> <li>Digits to the right of a digit will have less value.</li> <li>Place value has patterns that are repeated within big numbers.</li> </ul>	<ul style="list-style-type: none"> <li>I can identify the value of digits in numbers up to a billion. <ul style="list-style-type: none"> <li>For example, the 8 in 845 has a value of 800 which is ten times as much as the 8 in the number 782. The 8 in 782 is 1/10 the value of the 8 in 845.</li> </ul> </li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT A 4 Evaluate the value of powers of 10 and understand the relationship to the place value system.	
<b>LEARNING OBJECTIVE #5</b>	<ul style="list-style-type: none"> <li>I can evaluate the value of powers of 10 and understand the relationship to the place value system.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Exponent</li> <li>Powers of 10</li> <li>Place value</li> </ul>	<ul style="list-style-type: none"> <li>A digit in one place represents 10 times what it represents in the place to its right and 1/10 of what it represents in the place to its left.</li> <li>That <math>10 \times 10 \times 10</math> may be written as an exponent.</li> <li>Exponents with 10 as a base number are also identified as powers of 10.</li> </ul>	<ul style="list-style-type: none"> <li>I can multiply a number by powers of 10 by moving a decimal point to the right.</li> <li>I can divide a number by powers of 10 by moving a decimal point to the left.</li> <li>I can use exponents as an efficient way to represent repeated multiplication.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT A.5 Round numbers from billions to thousandths place.
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<b>LEARNING OBJECTIVE #6</b>	<ul style="list-style-type: none"> <li>I can round numbers from billions to the thousandths place.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Estimate</li> <li>Round</li> <li>Place value</li> </ul>	<ul style="list-style-type: none"> <li>That we estimate to get an approximate amount.</li> <li>In our lives we estimate more than finding exact answers.</li> <li>Estimation requires an understanding of rounding.</li> </ul>	<ul style="list-style-type: none"> <li>I can round numbers to the nearest thousandth.</li> <li>I can use estimation to check the reasonableness of a solution.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBT.A.6 Add and subtract multi-digit whole numbers and decimals to the thousandths place, and justify the solution.	
<b>LEARNING OBJECTIVE #7</b>	<ul style="list-style-type: none"> <li>I can add and subtract multi-digit whole numbers and decimals to the thousandths place, and justify the solution.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Add</li> <li>Subtract</li> <li>Sum</li> <li>Difference</li> <li>estimate</li> <li>Place value</li> </ul>	<ul style="list-style-type: none"> <li>Using the same base-ten place value system for adding, subtracting, multiplying, and dividing decimals that they use for adding, subtracting, multiplying, and dividing whole numbers.</li> <li>Adding and subtracting decimals the decimals need to line up according to place.</li> <li>That explaining and justifying my answer helps me understand the process of adding and subtracting numbers.</li> <li>How to use estimation to check for reasonableness of my solution.</li> </ul>	<ul style="list-style-type: none"> <li>Explain the process of a strategy used in solving an addition or subtraction problem using decimals; for example, place value charts, number lines, base ten blocks, and discs.</li> <li>Solve addition and subtraction problems using decimals up to the hundredths place.</li> </ul>

<b>REFERENCES/STANDARDS</b>	NBTA.7 Multiply multi-digit whole numbers and decimals to the hundredths place, and justify the
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<b>Missouri Learning Standard</b>	solution.	
<b>LEARNING OBJECTIVE #8</b>	<ul style="list-style-type: none"> <li>● <b>I can multiply multi-digit whole numbers and decimals to the hundredths place, and justify the solution.</b></li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Multiply</li> <li>● Product</li> <li>● estimate</li> <li>● Place value</li> <li>● Repeated addition</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication is repeated addition.</li> <li>● The standard algorithm can be the most efficient method for multiplying multi-digit whole numbers.</li> <li>● That explaining and justifying my answer helps me understand the process of multiplying numbers.</li> </ul>	<ul style="list-style-type: none"> <li>● I can multiply decimals to hundredths, using concrete models or drawings and strategies based on place value and properties of operations; relate the strategy to a written method and explain the reasoning used.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NBTA.8 Divide multi-digit whole numbers and decimals to the hundredths place using up to two-digit divisors and four-digit dividends, and justify the solution.	
<b>LEARNING OBJECTIVE #9</b>	<ul style="list-style-type: none"> <li>● <b>I can divide multi-digit whole numbers and decimals to the hundredths place using up to two-digit divisors and four-digit dividends, and justify the solution.</b></li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Divide</li> <li>● Quotient</li> <li>● Estimate</li> <li>● Dividend</li> <li>● divisor</li> <li>● Place value</li> </ul>	<ul style="list-style-type: none"> <li>● The relationship of division to multiplication as an inverse operation. Division is finding an unknown factor; the dividend is the product, the divisor is the known factor, and the quotient is the unknown factor.</li> <li>● That explaining and justifying my answer helps me understand the process of dividing numbers.</li> </ul>	<ul style="list-style-type: none"> <li>● I can divide whole numbers and decimals to hundredths, using concrete models or drawings and strategies based on place value and properties of operations; relate the strategy to a written method and explain the reasoning used.</li> </ul>



<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NF.A.1 Understand the relationship between fractions and decimals (denominators that are factors of 100).	
<b>LEARNING OBJECTIVE #10</b>	<ul style="list-style-type: none"> <li>I can understand the relationship between fractions and decimals (denominators that are factors of 100).</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Fraction</li> <li>Divisor</li> <li>Dividend</li> <li>Denominator</li> <li>Numerator</li> </ul>	<ul style="list-style-type: none"> <li>Fractions and decimals are related.</li> <li>Fractions and decimals are used in real life including money, weight, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Write decimals as fractions and fractions as an equivalent decimals.</li> <li>Identify real life situations where fractions and decimals are used.</li> <li>Find common likeness and differences between fractions and decimals.</li> <li>Identify fractions and decimals on a number line.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li><a href="http://www.openmiddle.com/multiplying-decimals-given-one/">http://www.openmiddle.com/multiplying-decimals-given-one/</a></li> <li><a href="#">Decimal Place Value Formative</a></li> <li><a href="#">Compare and Order Decimals Formative</a></li> <li><a href="#">Aquarium Project</a></li> <li><a href="#">Aquarium Project Fish List'</a></li> <li>(Need presentation for fish project)</li> <li><a href="#">Operation Assessment</a></li> <li><a href="#">Second Trimester Operation Assessment</a></li> <li>Formative Assessments</li> <li>Common Assessments</li> <li><a href="http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-School-Supplies.pdf">http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-School-Supplies.pdf</a> NBT .A. 6, NBT. A. 7, NBT. A. 8</li> </ul>	formative Formative Formative Formative Formative Formative Summative Summative Formative Summative Performance Task	3,4 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3 1,2,3

<b>LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING</b> <i>Research based instructional strategies</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Model using fraction tile manipulatives</li> <li>● Model using bar method</li> <li>● Math in Practice Module 1 Understanding Place value</li> </ul>	<ul style="list-style-type: none"> <li>● See primary math resource</li> <li>● See supplemental unit</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3,4</li> </ul>
<b>HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?</b> <i>Possible Interventions or differentiation strategies</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● Small group instruction</li> <li>● Place value mats/with number manipulatives</li> <li>● Front Row</li> <li>● Value modeling</li> <li>● Number talks</li> <li>● Games</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> <li>● 1,2,3</li> <li>● 1,2,3</li> <li>● 1,2,3</li> <li>● 1,2,3</li> </ul>
<b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i>		
<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Banking, writing checks</li> <li>● Different forms of numbers project</li> <li>● Pizza shop project (front row)</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="https://robertkaplinsky.com/work/much-money-pennies/">https://robertkaplinsky.com/work/much-money-pennies/</a></li> <li>● <a href="https://robertkaplinsky.com/work/how-much-money-are-the-coins-worth/">https://robertkaplinsky.com/work/how-much-money-are-the-coins-worth/</a></li> <li>● <a href="https://robertkaplinsky.com/work/write-a-check/">https://robertkaplinsky.com/work/write-a-check/</a></li> </ul>	<ul style="list-style-type: none"> <li>● 3,4</li> <li>● 3,4</li> <li>● 3,4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 5th grade

**TOPIC:** Number Sense and Operations in Fractions

**CAREER CONNECTION:** Engineers, Researchers, Bakers and Chefs, Seamstresses and Quilters, Architects, Farmers, Mechanics, Pharmacist, Medical Doctors, Health Staff, Realtors, Occupations That Use Fractions

**DESCRIPTION:**  
Recognizes the relationship between fractions and decimals (denominators that are factors of 100): that parts of whole may be expressed as fractions. Compares and orders fractions and justifies the solution. Solves word problems with the four operations on fractions and mixed numbers and justify the reasonableness of the answer. This topic sets students up to work with fractions with unlike denominators in sixth grade.

**INSTRUCTIONAL RESOURCES:** Math in Focus and Math in Practice Teaching Fifth Grade Math

**LITERATURE CONNECTION:**

- Gator Pie
- Fractions in Disguise, A Math Adventure
- Eating Fractions
- Full House, An Invitation to Fractions
- If You Hopped Like a Frog
- Sir Cumference and the Fractions Faire

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
5.NF. A.1 Understand that parts of a whole number can be expressed as fractions and/or decimals.		x
5.NF.A. 2 Convert decimals to fractions and fractions to decimals.	x	
5.NF.A.3 Compare and order fractions and/or decimals to the thousandths place using symbols, less than, greater than and equal to, and justify solution	x	
5.NF. B Perform operations and solve problems with fractions and decimals	x	
5. NF.B.4 Estimate results of sums, differences, and products with fractions and decimals to the thousandths	x	
5.NF.B.5 Justify the reasonableness of a product when multiplying with fractions	x	
5.NF.B.6 Solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators and justify the solution.	x	
5.NF.B.7 Extend the concept of multiplication to multiply a fractions or whole number by a fraction.	x	
5.NF.B.8 Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations.	x	
5.DS.A.2 Create a line plot to represent a given or generated data set, and analyze the data to answer questions and solve problems, recognizing the outliers and generating the median.		x

### Standards of Mathematical Practice Applied in this Unit

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Model with mathematics.
4. Attend to precision.

#### ENDURING UNDERSTANDINGS:

- Understand that fractions and decimals are related.
- Compare and order fractions and decimals using symbols  $>$ ,  $<$ , and  $=$  and justify the solution.
- Estimating justifies reasonableness when solving problems with fractions and decimals.
- The use of area models, fraction strips, and number lines are effective strategies to model sums and differences.
- Equivalent fractions are critical when adding and subtracting fractions with unlike denominators.
- Fractions are division models.
- Benchmark fractions and other strategies aid in estimating the reasonableness of results with operations of fractions.
- The use of area models, fraction strips, and number lines are effective strategies to model products and quotients.
- Use your knowledge of fractions and equivalence to develop algorithms for adding, subtracting, multiplying and dividing.
- Multiplication can be interpreted as scaling/resizing.

#### ESSENTIAL QUESTIONS:

- How are fractions and decimals alike?
- How does estimation help us understand reasonableness?
- How is the process of adding, subtracting, and multiplying different with whole numbers, fractions, and decimals?
- How can we use pictures, models, and tables to better understand and explain operations on numbers including fractions and decimals?
- What does it mean to multiply fractions?
- How does multiplication and division of fractions help to solve real world problems?
- How do you use previous understandings of multiplication and division to multiply or divide fractions?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF. A.1 Understand that parts of a whole number can be expressed as fractions and/or decimals.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can recognize parts of a whole number can be expressed as fractions and/or decimals</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Fraction</li> <li>Numerator</li> <li>Denominator</li> <li>Decimal</li> <li>Number Line</li> <li>Fraction Model</li> </ul>	<ul style="list-style-type: none"> <li>One whole may divided into equal pieces that may be expressed as fractions or decimals.</li> <li>Use models and a number line to show that parts of a whole number may be expressed as fractions and/or decimals.</li> <li>Every fraction and decimal have a unique place on the number line.</li> <li>A fraction and decimal can be equivalent and be at the same place on a number line.</li> </ul>	<ul style="list-style-type: none"> <li>I can identify which part of a number is the whole or group.</li> <li>I can identify which part of a number is the part (fraction/decimal).</li> <li>I can write fractions/decimals that name parts of a whole number.</li> <li>I can identify the denominator as the number of equal pieces the whole is divided into.</li> <li>I can identify the numerator as the part or piece of the whole.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF.A. 2 Convert decimals to fractions and fractions to decimals.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can convert decimals to fractions and fractions to decimals.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Equivalent</li> <li>Numerator</li> <li>Denominator</li> <li>Division</li> <li>Benchmark Fractions</li> </ul>	<ul style="list-style-type: none"> <li>Decimals can easily be changed to fractions with denominators that are factors of 10: 1/10, 1/100, 1/1000</li> <li>Fractions with denominators that are factors of 10 (or make equivalent fractions with denominators factors of 10) may easily be written as an equivalent decimals.</li> </ul>	<ul style="list-style-type: none"> <li>I can find equivalent decimals for fractions with denominators that have factors of 10 or I can make an equivalent fraction with a denominator that can have a factor of 10. <math>\frac{1}{2} = 5/10 = 0.5</math></li> </ul>

	<ul style="list-style-type: none"> <li>I also can divide the numerator by the denominator and my answer will be a decimal - that any fraction can be converted to a decimal.</li> </ul>	<ul style="list-style-type: none"> <li>I can change any fraction to a decimal by dividing the numerator by the denominator.</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	5.NF.A.3 Compare and order fractions and/or decimals to the thousandths place using symbols, less than, greater than and equal to, and justify solutions.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li><b>I can compare and order fractions and/or decimals to the thousandths place using symbols, less than, greater than and equal to, and justify solutions.</b></li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Equivalent</li> <li>Compare</li> <li>Order</li> <li>Number Line</li> <li>Fraction Bars</li> <li>Benchmark Fractions</li> <li>Symbols &gt;, &lt;, and =</li> <li>Common Denominator</li> </ul>	<ul style="list-style-type: none"> <li>Every fraction and decimal have a unique place on the number line and fractions and decimals on the number line are sequential.</li> <li>Fractions with the same denominator can be compared and ordered according to the size of the numerator.</li> <li>Because I understand the size and place on a number line of specific benchmark fractions: <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{2}</math>, <math>\frac{2}{5}</math>, <math>\frac{3}{4}</math> and fractions with 10 as a denominator, and then I can use those benchmarks to justify comparing and ordering.</li> </ul>	<ul style="list-style-type: none"> <li>I can place fractions and decimals on a number line.</li> <li>I can use symbols &gt;, &lt;, and = when comparing and ordering decimals and fractions.</li> <li>I can find a common denominator for two or more fractions.</li> <li>I can compare and order fractions with the same denominator according to the size of the numerators and use this skill to justify.</li> <li>I can use benchmark fractions to compare and order fractions to justify solutions.</li> <li>I can use fraction bars, fraction models, number lines, and pictures to compare and order fractions.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF. B Perform operations and solve problems with fractions and decimals.	
<b>LEARNING OBJECTIVE</b>	● <b>I can perform operations and solve problems with fractions and decimals.</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Fraction model</li> <li>● Bar model</li> </ul>	<ul style="list-style-type: none"> <li>● Fractions and decimals can be used to aid in explaining real world problems.</li> </ul>	<ul style="list-style-type: none"> <li>● I can use models to understand operations with fractions and decimals.</li> <li>● I can add, subtract and multiply fractions and decimals to solve real world problems and justify solutions.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5. NF.B.4 Estimate results of sums difference and products with fractions and decimals to the thousandths.	
<b>LEARNING OBJECTIVE #4</b>	● <b>I can estimate results of sums and difference with fractions and decimals.</b>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Number Sense - size of fractions/place on number line</li> <li>● Reasonableness of an answer</li> <li>● Estimate</li> <li>● Benchmark Fractions</li> <li>● Mixed Numbers</li> <li>● Number Line</li> </ul>	<ul style="list-style-type: none"> <li>● Estimating sums and differences of fraction and decimals is a strategy to explain reasonableness of a solution.</li> <li>● Number sense and mental math are strategies that can be used to justify solutions.</li> <li>● Benchmark fractions can help to justify the reasonableness of a solution.</li> <li>● Estimating sums and differences of mixed numbers uses the same strategies as with fractions and whole numbers.</li> </ul>	<ul style="list-style-type: none"> <li>● I can use mental math to assess the reasonableness of a solution to a problem that involves fractions.</li> <li>● I can estimate the sum of two mixed numbers.</li> <li>● I can estimate the difference between two mixed numbers.</li> <li>● I can use benchmark fractions to justify the reasonableness of fraction sums and/or differences.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF.B.5 Justify the reasonableness of a product when multiplying with fractions. 5.NF.B.7 Extend the concept of multiplication to multiply a fractions or whole number by a fraction.	
<b>LEARNING OBJECTIVE #5</b>	<ul style="list-style-type: none"> <li>● <b>I can explain reasonable answers when multiplying fractions</b></li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b>  <i>Facts, Names, Dates, Places, Information,</i>  <b>ACADEMIC VOCABULARY</b></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b>  <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b>  <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Unit fraction</li> <li>● Product</li> <li>● Fraction models</li> <li>● Partition</li> <li>● Equivalent Fractions</li> <li>● Improper Fractions</li> <li>● Mixed Numbers</li> </ul>	<ul style="list-style-type: none"> <li>● Multiplication of a fraction by a whole number can be represented as repeated addition of a unit fraction (e.g., <math>2 \times (1/4) = 1/4 + 1/4</math>).</li> <li>● The product <math>(a/b) \times q</math> represents a part (number of parts) divided into b equal parts. The whole number times the numerator divided by denominator; the product will be smaller than the whole number.</li> <li>● Multiplying a factor by a number greater than 1 results in a product that is greater than the given number or factor.</li> <li>● Multiplying by a number less than one results in a product that is less than the given number or factor.</li> <li>● The product of two fractions is less than either factor.</li> <li>● The most efficient strategy to multiply mixed numbers might be to use improper fractions.</li> </ul>	<ul style="list-style-type: none"> <li>● I can multiply a fraction by a whole number, simplify the solution, and check for reasonableness- the product will always be smaller than the whole number.</li> <li>● I can estimate the size of the product based on the size of the two factors and use that to justify the reasonableness of a solution.</li> <li>● I can explain why the product of two fractions is less than either factor using fraction area models.</li> <li>● I can solve real -world problems involving the multiplication of fractions and mixed numbers using visual models (bar modeling, fraction area models), equations and other problem solving strategies.</li> <li>● I can use the most efficient algorithm to multiply fractions and mixed numbers and simplify the solution.</li> </ul>



<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF.B.6 Solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators and justify the solution.	
<b>LEARNING OBJECTIVE #7</b>	<ul style="list-style-type: none"> <li>● <b>I can solve problems involving addition and subtraction of fractions and mixed numbers with unlike denominators and justify the solution.</b></li> </ul>	
<p style="text-align: center;"><b>I KNOW?</b>  <i>Facts, Names, Dates, Places, Information,</i>  <b>ACADEMIC VOCABULARY</b></p>	<p style="text-align: center;"><b>I UNDERSTAND?</b>  <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p style="text-align: center;"><b>I CAN?</b>  <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>● Equivalent fractions</li> <li>● Factors</li> <li>● Multiples</li> <li>● Least common multiples</li> <li>● Common denominators</li> <li>● Least Common denominators</li> <li>● Greatest common factor</li> <li>● Simplify/Reduce/Lowest Terms</li> <li>● Fraction Area Models, Fraction bar models</li> <li>● Improper fraction</li> <li>● Proper fraction</li> </ul>	<ul style="list-style-type: none"> <li>● Fractions and mixed numbers have to have like denominators when adding and subtracting.</li> <li>● Multiplying or dividing a fraction by the same non-zero numerator and denominator (1) will create an equivalent fraction.</li> <li>● Fraction area models and fraction bar models explain equivalent fractions.</li> <li>● I can apply and extend the principles of the addition and subtraction algorithm including borrowing to fractions and mixed numbers.</li> <li>● When adding and subtracting mixed numbers to first add/subtract the fraction and then the whole number.</li> </ul>	<ul style="list-style-type: none"> <li>● I can use problems solving strategies such as bar models, equations, and or pictures to solve problems that include fractions and mixed numbers and justify the solution.</li> <li>● I can create equivalent fractions by multiplying/dividing numerators and denominators by the same non-zero number .</li> <li>● I can create equivalent fractions using fraction area models and add and subtract fractions with area models.</li> <li>● I can find common denominators to add or subtract fractions by creating equivalent fractions to replace the addends or minuend - subtrahend.</li> <li>● I can find common denominators by finding the least common multiple of fraction denominators.</li> <li>● I can simplify fractions, solutions, by finding the greatest common factor of the numerator and denominator.</li> <li>● I can apply and extend previous understanding of subtraction to borrowing or trading first with mixed numbers and fractions.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.NF.B.8 Extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations.	
<b>LEARNING OBJECTIVE #8</b>	<ul style="list-style-type: none"> <li>I can extend the concept of division to divide unit fractions and whole numbers by using visual fraction models and equations.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Reciprocal</li> <li>Quotient</li> <li>Inverse operation</li> </ul>	<ul style="list-style-type: none"> <li>I understand the concept of division and equal sharing and if I divide a unit fraction by a whole number the quotient will be smaller piece than the fraction.</li> <li>I understand if I divide a whole number by a unit fraction the quotient will be larger than the dividend.</li> </ul>	<ul style="list-style-type: none"> <li>I can solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions by using models and pictures.</li> <li>I can apply and extend division and multiplication algorithms to unit fractions and whole numbers and whole numbers and unit fractions and justify the solution</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.DS.A.2 Create a line plot to represent a given or generated data set, and analyze the data to answer questions and solve problems, recognizing the outliers and generating the median.	
<b>LEARNING OBJECTIVE #10</b>	<ul style="list-style-type: none"> <li>I can solve real world problems using a line plot and organize data by creating my own line plot.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Line Plot</li> <li>Median</li> <li>Mode</li> <li>Mean</li> <li>Data set</li> </ul>	<ul style="list-style-type: none"> <li>Line plots organize information.</li> <li>Each X on a line represents a value in a set of data.</li> <li>Using line plots makes identifying mean, mode, and median easier.</li> <li>The median is the data point in the middle.</li> <li>The mode is number in the data generated most often.</li> </ul>	<ul style="list-style-type: none"> <li>I can create 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>).</li> <li>I can represent data on a line plot by drawing Xs for each value in the set of data.</li> <li>I can answer questions about a line plot by using the data values that each X represents.</li> <li>I can use operations on fractions to solve real world problems involving information presented in line plots.</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● <a href="http://www.openmiddle.com/adding-mixed-numbers-3/">http://www.openmiddle.com/adding-mixed-numbers-3/</a></li> <li>● <a href="http://www.openmiddle.com/fraction-equivalence/">http://www.openmiddle.com/fraction-equivalence/</a></li> <li>● <a href="http://3-5cctask.ncdpi.wikispaces.net/5.NF.1-5.NF.2">http://3-5cctask.ncdpi.wikispaces.net/5.NF.1-5.NF.2</a></li> <li>● <a href="http://www.rcoe.us/educational-services/files/2013/11/asmt-sbac-math-gr5-sample-items.pdf">http://www.rcoe.us/educational-services/files/2013/11/asmt-sbac-math-gr5-sample-items.pdf</a> sample items for many standards good formatives</li> <li>● <a href="#">Common Summative Assessments</a> for Adding and Subtracting Fractions</li> <li>● Common formative assessments, exit slips, observation</li> <li>● <a href="http://ccsmathactivities.com/wp-content/uploads/2017/05/Math_G5_ImprovingOurSchool1.pdf">http://ccsmathactivities.com/wp-content/uploads/2017/05/Math_G5_ImprovingOurSchool1.pdf</a> multiplying fractions, dividing whole by unit fraction</li> <li>● <a href="http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-Johns-Trip-to-Disneyland.pdf">http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-Johns-Trip-to-Disneyland.pdf</a> adding and subtraction fractions, justifying, estimating</li> <li>● <a href="http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-Soccer-Snacks.pdf">http://ccsmathactivities.com/wp-content/uploads/2015/10/G5-Soccer-Snacks.pdf</a></li> </ul>	<p>Formative</p> <p>Formative</p> <p>Formative</p> <p>Formative</p> <p>Formative</p> <p>Performance Task</p> <p>Performance Task</p> <p>Performance Task</p>	<p>DOK 3 and DOK 4 - estimating sums</p> <p>DOK 3 and 4 - good for justifying products of fractions</p> <p>1,2,3,4 8 different formative assessments</p> <p>5NF.B.6</p> <p>1,2,3</p> <p>Some DOK 2 some DOK 3</p> <p>1,2,3 for 5NF.B.5, 5NF.B.7, 5NF.B.8</p> <p>1,2,3, for 5NF.B.6</p> <p>1,2,3 for multiplying and dividing fractions</p>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● <a href="#">Benchmark Fraction Number Line</a></li> <li>● Using Fraction Bars to compare/order and find equivalent fractions, pattern blocks, and other fraction manipulatives</li> <li>● Create fraction area models to show equivalent fractions/common denominators</li> <li>● <a href="#">Math in Practice Fifth Grade</a> Modules: 5,6,7,8,9, 10, and 12</li> </ul>	<ul style="list-style-type: none"> <li>● Math in Practice Page adding fractions with unlike denominators (145)</li> <li>● Math in Practice Multiplying and Dividing decimals Module 6 (120)</li> <li>● Math in Practice Adding and Subtracting Fractions with Unlike Denominators (142)</li> <li>● Math in Practice Exploring Fraction as Division (166)</li> <li>● Math in Practice Dividing Whole Numbers and Unit Fractions (203)</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?***Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● Math in Practice Adding and Subtracting decimals module 5 (99)</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?***Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="https://robertkaplinsky.com/work/how-many-biscuits-can-you-make/">https://robertkaplinsky.com/work/how-many-biscuits-can-you-make/</a></li> </ul>	<ul style="list-style-type: none"> <li>● <a href="https://robertkaplinsky.com/work/how-many-biscuits-can-you-make/">https://robertkaplinsky.com/work/how-many-biscuits-can-you-make/</a></li> </ul>	<ul style="list-style-type: none"> <li>● 3,4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 5th grade

**TOPIC:** Relationships and Algebraic Thinking

**CAREER CONNECTION:**

Math Buddies Math and Science Career Connections

**INSTRUCTIONAL RESOURCES:** Math in Focus (Singapore Math) and Math in Practice Teaching Fifth Grade Math

**LITERATURE CONNECTION:**

Math Potatoes Mind Stretching by Greg Tang

Math For All Seasons: Mind-Stretching Math Riddles by Greg Tang

**DESCRIPTION:**

Evaluates numerical expression using parentheses, brackets, or braces; and compares numerical patterns in tables and by graphing. Create and uses a first quadrant cartesian coordinate plane to solve problems. This topic lays the foundation for sixth grade when students will write expressions with numbers and variables and write equivalent expressions.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
5.RA.A.1 Investigate the relationship between two numeric patterns.	x	
5.Ra.A.2 Write a rule to describe or explain a given numeric pattern.	x	
5 RA.B.3 Write, evaluate, and interpret numerical expressions using the order of operations.	x	
5.RA.B.4 Translate written expressions into algebraic expressions.	x	
5.RA.C. 5 Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals	x	
5.GM. C. 6 Define a first quadrant Cartesian coordinate system.		x
5.GM. C.7. Plot and interpret points in the first quadrant of the Cartesian coordinate plane.		x
5.DS.A.1 Create a line graph to represent a data set, and analyze the data to answer questions and solve problems.	x	

**Standards of Mathematical Practice Applied in this Unit**

- Look for and make use of structure.
- Construct viable arguments and critique the reasoning of others.
- Attend to precision

**ENDURING UNDERSTANDINGS:**

- There is a mathematical order in problem solving.
- Real world situations can be represented symbolically and graphically.
- All points can be represented using a coordinate system

**ESSENTIAL QUESTIONS:**

- How do I find pattern and trends in data?
- How do I use algebraic expressions to analyze or solve problems?
- How can patterns be used to make predictions?
- How do I know where to begin when solving a problem?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.RA.A.1 Investigate the relationship between two numeric patterns.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li>I can investigate the relationship between two numeric patterns.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Relationship</li> <li>Sequence</li> <li>Rules</li> <li>Terms</li> <li>Corresponding Terms</li> </ul>	<ul style="list-style-type: none"> <li>Two sequences that follow a given rule will have a relationship between corresponding terms.</li> <li>Patterns in numbers can be used to problem solve</li> </ul>	<ul style="list-style-type: none"> <li>I can identify the relationship between two sets of numbers by looking at the corresponding terms.</li> <li>I can utilize the relationship between two sets of numbers when solving problems</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.Ra.A.2 Write a rule to describe or explain a given numeric pattern.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li>I can write a rule to describe or explain a given numeric pattern.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Rule</li> <li>Relationship</li> <li>Terms</li> <li>Variables</li> <li>Sequence</li> </ul>	<ul style="list-style-type: none"> <li>Numbers in a sequence will form pattern using a given rule.</li> </ul>	<ul style="list-style-type: none"> <li>I can identify a rule for a sequence of numbers by looking at the pattern.</li> <li>I can generate number patterns using given rules.</li> <li>I can utilize an identified or generated pattern when problem solving</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	5 RA.B.3 Write, evaluate, and interpret numerical expressions using the order of operations.	
<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>I can write, evaluate, and interpret numerical expressions using the order of operations.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Expressions</li> <li>PEMDAS</li> </ul>	<ul style="list-style-type: none"> <li>Using a specific order when solving expressions can be useful.</li> </ul>	<ul style="list-style-type: none"> <li>I can use the order of operations to evaluate numerical expressions with more than one</li> </ul>

<ul style="list-style-type: none"> <li>● Parenthesis</li> <li>● Evaluate</li> <li>● Interpret</li> <li>● Numerical</li> <li>● Algebraic</li> <li>● translate</li> </ul>	<ul style="list-style-type: none"> <li>● Expressions and equations can represent and describe word problems and mathematical situations.</li> <li>● A variety of word phrases can represent an operation.</li> </ul>	<p>operation.</p> <ul style="list-style-type: none"> <li>● I can write expressions and equations to represent calculations and describe word problems.</li> <li>● I can compare two expressions by evaluating them.</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.RA.B.4 Translate written expressions into algebraic expressions.	
<b>LEARNING OBJECTIVE #4</b>	● I can translate written expressions into algebraic expressions.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● variables</li> <li>● expression</li> <li>● numbers</li> <li>● operations</li> <li>● translate</li> <li>● interpret</li> </ul>	<ul style="list-style-type: none"> <li>● Expressions are written with numbers, operations and variables</li> </ul>	<ul style="list-style-type: none"> <li>● Interpret word phrases into algebraic expressions</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.RA.C. 5 Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals	
<b>LEARNING OBJECTIVE #5</b>	● I can solve and justify multi-step problems involving variables, whole numbers, fractions and decimals.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● variables</li> <li>● expression</li> <li>● numbers</li> <li>● operations</li> <li>● translate</li> <li>● interpret</li> </ul>	<ul style="list-style-type: none"> <li>● Expressions are written with numbers, operations and variables</li> <li>● Real world problems can be written as expressions</li> </ul>	<ul style="list-style-type: none"> <li>● Solve various multi-step problems</li> <li>● Interpret word problems into expressions</li> <li>● Write multi step expressions</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.GM. C. 6 Define a first quadrant Cartesian coordinate system. 5.GM. C.7. Plot and interpret points in the first quadrant of the Cartesian coordinate plane.	
<b>LEARNING OBJECTIVE #6</b>	<ul style="list-style-type: none"> <li>I can define a first quadrant Cartesian coordinate system and plot and interpret points in the first quadrant of the Cartesian coordinate plane.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>coordinate</li> <li>ordered pairs</li> <li>plot</li> <li>point</li> <li>origin</li> <li>axis</li> <li>left/right</li> <li>up/down</li> <li>coordinate plane</li> <li>grid</li> </ul>	<ul style="list-style-type: none"> <li>The first quadrant Cartesian coordinate system contains positive numbers</li> <li>The origin is where the x axis and y axis intersect</li> <li>The x axis is a horizontal line.</li> <li>The y axis is a vertical line.</li> <li>Ordered pairs are written with x coordinate first and the y coordinate second both separated by a comma</li> <li>Ordered pairs define unique points that can be plotted on the grid</li> </ul>	<ul style="list-style-type: none"> <li>I can identify the x and y axis on a Cartesian grid.</li> <li>I can represent the axes as scaled perpendicular number lines that both intersect at 0, the origin.</li> <li>Plot ordered pairs on a Cartesian grid.</li> <li>Identify the x and y axis on a Cartesian grid.</li> <li>Determine values on the x and y axis.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.DS.A.1 Create a line graph to represent a data set, and analyze the data to answer questions and solve problems.	
<b>LEARNING OBJECTIVE #8</b>	<ul style="list-style-type: none"> <li>I can graph as visual representation of data sets or number patterns.</li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Data sets</li> <li>Line graph</li> <li>relationship</li> </ul>	<ul style="list-style-type: none"> <li>Data sets can be represented at a graph</li> <li>Graphs can aid in seeing how parts of a data table interact</li> </ul>	<ul style="list-style-type: none"> <li>Correctly label the Y axis based on the data set</li> <li>Correctly label the X axis based on the data set</li> <li>Correctly graph data set</li> <li>Correctly interpret and explain the graphed information</li> </ul>



**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<p align="center"><b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence <b>Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment</b></p>	<p align="center"><b>FORMATIVE OR SUMMATIVE?</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● <u>Performance Task Order of Operations</u></li> <li>● <u>Performance Task - Investigating Numeric Patterns and Graphing</u></li> <li>● Common Assessments</li> <li>● Common formative assessments, exit slips, observation</li> </ul>	<ul style="list-style-type: none"> <li>● Formative</li> <li>● Summative</li> <li>● formative</li> </ul>	<p>1,2,3 1,2,3 1,2,3</p>

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Solve expressions using substitution.</li> <li>● Solve and graph equations and inequalities.</li> <li>● Cooperative learning</li> <li>● Vocabulary</li> <li>● Math in Practice Module 13: Understanding the Coordinate System</li> </ul>	<ul style="list-style-type: none"> <li>● Model with manipulatives</li> <li>● Use visual models (balance/ scale)</li> <li>● Articulate their thinking through Math Talks</li> <li>● <u>Growing Number Patterns Activity</u></li> <li>● Math In Practice (5th Grade Math) Module 2 (Page 48)</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<p align="center"><b>TEACHER INSTRUCTIONAL ACTIVITY</b></p>	<p align="center"><b>STUDENT LEARNING TASK</b></p>	<p align="center"><b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)</p>
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● Reinforcing skills in small group instruction</li> <li>● Games</li> <li>● <u>Review Activities</u> for Multistep equations</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"><li>• Provide opportunities to extend learning through guided projects</li><li>• Provide opportunities to extend learning through connections to real world opportunities</li></ul>	<ul style="list-style-type: none"><li>• <u>How many Bedsheets Do we Need to Break Out of Prison? Kaplinsky</u></li></ul>	<ul style="list-style-type: none"><li>• 3, 4</li></ul>



**CONTENT AREA:** Mathematics

**COURSE:** 5th grade

**TOPIC:** Geometry and Measurement

**CAREER CONNECTION:**

Math Buddies Math and Science Career Connections

**INSTRUCTIONAL RESOURCES:** Math in Focus and Math in Practice Teaching Fifth Grade Math

**LITERATURE CONNECTION:**

Perimeter, Area, and Volume: A Monster Book of Dimensions

**DESCRIPTION:**

Calculate conversions within a system and solves problems; identifies and represents volume an attribute of three-dimensional objects; solves problems involving volume, area and perimeter and recognize volume as additive. This topic prepares students to calculate volume of rectangular prisms with fractional measurements and calculating surface area in sixth grade.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
5.GM.A.1 Understand that attributes belonging to a category of figures also belong to all subcategories.		x
5.GM.A.2 Classify figures in a hierarchy based on properties.		x
5.GM.A.3 Analyze and describe the properties of prisms and pyramids.		x
5.GM.B.4 Understand the concept of volume and recognize that volume is measured in cubic units.	x	
5..GM.B.5 Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for volume of right rectangular prisms with whole-number edge lengths.		x
5.GM.D.8 Convert measurements of capacity, length and weight within a given measurement system.		x
5.GM.D.9 Solve multi-step problems that require measurement conversions.	x	

**Standards of Mathematical Practice Applied in this Unit**

- Use appropriate tools strategically.
- Attend to precision.

**ENDURING UNDERSTANDINGS:**

- Within a measurement system you can express distance, weight, mass and capacity more than one way.
- There is a measurement of how much space an object takes up.
- Volume is measured in cubic unit.

**ESSENTIAL QUESTIONS:**

- How do I use the different units of measurements within a system?
- I do I figure volume?
- How many cubes will fill a rectangular prism.

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.GM.A.1 Understand that attributes belonging to a category of figures also belong to all subcategories. 5.GM.A.2 Classify figures in a hierarchy based on properties. 5.GM.A.3 Analyze and describe the properties of prisms and pyramids.	
<b>LEARNING OBJECTIVE #1</b>	<ul style="list-style-type: none"> <li><b>I can describe, analyze and classify four-sided figures and their properties</b></li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Faces</li> <li>Edges</li> <li>Vertices</li> <li>Figures</li> <li>Attributes</li> <li>Relationships</li> <li>Shape hierarchy</li> <li>Surface area</li> <li>Net</li> </ul>	<ul style="list-style-type: none"> <li>Different shapes have different attributes.</li> <li>A visual representation of a shape hierarchy is an efficient way to describe the relationships among shapes with similar attributes.</li> <li>Relationships between shapes can be used to solve problems and describe the real world.</li> <li>triangles and four-sided figures have their own special properties and will identify and classify solid figures by the number of faces, edges, and vertices.</li> </ul>	<ul style="list-style-type: none"> <li>Given a shape, tell what other names of shapes could be used to classify the shape.</li> <li>All shapes are identified by their specific attributes.</li> <li>Any subcategory of shape must also belong to the more general category of which a shape belongs.</li> <li>Solid figures can be identified and classified by the number of faces, edges, and vertices</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	5.GM.B.4 Understand the concept of volume and recognize that volume is measured in cubic units. 5.GM.B.5 Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for volume of right rectangular prisms with whole-number edge lengths.	
<b>LEARNING OBJECTIVE #2</b>	<ul style="list-style-type: none"> <li><b>I can find the volume of prisms both conceptually and using formulas for volume.</b></li> </ul>	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Rectangular Prisms</li> <li>How to find the volume of a rectangular prism</li> <li>Liquid measurement (capacity)</li> <li><math>V = l \times w \times h</math> and <math>V = B \times h</math></li> <li>Cube</li> </ul>	<ul style="list-style-type: none"> <li>A larger figure has more volume because it takes up more space; A 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume; A rectangular prism can be “packed”, without gaps or overlaps, using unit cubes.</li> <li>Volume is used to measure the amount of</li> </ul>	<ul style="list-style-type: none"> <li>Find the volume of a rectangular prism</li> <li>Find the volume of a solid that is made up of more than one rectangular prism</li> <li>Determine the best method for finding volume of “this” object</li> </ul>

<ul style="list-style-type: none"> <li>● Unit</li> <li>● Cubic unit</li> <li>● Space</li> <li>● Base</li> <li>● Height</li> <li>● width/depth</li> <li>● Area</li> <li>● Layers</li> </ul>	<p>space an object takes up. This could be a solid or a liquid measurement.</p> <ul style="list-style-type: none"> <li>● The number of non-overlapping cubes “packed” into a shape gives the measured volume.</li> </ul>	
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	5.GM.D.8 Convert measurements of capacity, length and weight within a given measurement system 5.GM.D.9 Solve multi-step problems that require measurement conversions.
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<b>LEARNING OBJECTIVE #3</b>	<ul style="list-style-type: none"> <li>● <b>I can solve multistep problems involving convert measurements of capacity, length and weight within a system.</b></li> </ul>
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<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
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<ul style="list-style-type: none"> <li>● Capacity</li> <li>● System</li> <li>● Measurement system</li> <li>● In., Ft., Yd., Miles</li> <li>● km, m, cm, mm; kg, g, mg, oz., lb., ton; L, mL, cup, pt., qt. and gal.</li> <li>● Convert (conversion)</li> </ul>	<ul style="list-style-type: none"> <li>● One milliliter of liquid volume is equal to one cubic cm of solid volume.</li> <li>● How to convert from km, m, cm, and mm</li> <li>● How to convert from kg, g, mg, oz, lb, ton</li> <li>● How to convert from cup, pt., qt. And gal</li> <li>● How to convert from mL to L</li> </ul>	<ul style="list-style-type: none"> <li>● Convert from km, m, cm, and mm</li> <li>● Convert from kg, g, mg, oz, lb, ton</li> <li>● Convert from cup, pt., qt. And gal</li> <li>● Convert from mL to L</li> <li>● Understand how we use units of measurement in our lives</li> <li>● Decide which unit of measurement to use</li> </ul>
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<b>HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED</b>
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<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="http://www.insidemathematics.org/assets/common-core-math-tasks/how%20many%20cubes.pdf">http://www.insidemathematics.org/assets/common-core-math-tasks/how%20many%20cubes.pdf</a></li> <li>● <a href="https://robertkaplinsky.com/work/drug-money/">https://robertkaplinsky.com/work/drug-money/</a></li> <li>● Common Assessments</li> </ul>	Formative  Formative Both	2,3,4  1,2,3 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Math in Practice: Module 11: Converting Like Measurement Units</li> <li>• Math in Practice: Module 13: Understanding Volume</li> <li>• Math in Practice Module 15: Classifying Two Dimensional Figures</li> </ul>	<ul style="list-style-type: none"> <li>• See modules 11, 13, and 15</li> </ul>	<ul style="list-style-type: none"> <li>• 1,2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Review prerequisite skills</li> <li>• Reteaching</li> <li>• Extra practice</li> <li>• Peer tutoring</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• Manipulatives (cubes) build rectangular prisms.</li> <li>• Gallon guy (manipulatives to represent measurement)</li> </ul>	<ul style="list-style-type: none"> <li>• 1,2</li> <li>• 1,2</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Extend student learning by finding volume of triangular prisms</li> <li>• Extend student learning by finding cross system conversions. (ex. Metric to customary)</li> <li>• Extend learning by finding surface area</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="https://robertkaplinsky.com/work/how-fast-was-the-fastest-motorcycle-speeding-ticket-ever/">https://robertkaplinsky.com/work/how-fast-was-the-fastest-motorcycle-speeding-ticket-ever/</a></li> <li>• <a href="https://robertkaplinsky.com/work/sunspots/">https://robertkaplinsky.com/work/sunspots/</a></li> </ul>	<ul style="list-style-type: none"> <li>• 3,4</li> <li>• 3,4</li> </ul>

## **Sixth Grade Math Curriculum**



**CONTENT AREA:** Mathematics

**COURSE:** 6th Grade

**TOPIC:** Data Analysis, Statistics, and Probability

**CAREER CONNECTION:**

Auditor, Financial Analyst, Statistician, Public Relations, Marketing, Accountants, Sales Agents, Investigator

[Weusemath.org](http://www.xpmath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus

**LITERATURE CONNECTION:** *Sir Cumference and the Off-the-Charts Dessert*

**DESCRIPTION:** Describe the nature and distribution of data in terms of shape, center, spread, and the number of observations; create appropriate data displays and use them to solve problems; calculate the mean absolute deviation; and understand the relationships between measures of center and measures of spread.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
DSP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.		X
DSP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.		X
DSP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary from a single number	X	
DSP.B.4 Display and interpret data. a. Use dot plots, histograms and box plots to display and interpret numerical data. b. Create and interpret circle graphs.		X
DSP.B.5 Summarize numerical data sets in relation to the context. a. Report the number of observations. b. Describe the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Give quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context of the data. d. Analyze the choice of measures of center and variability based on the shape of the data distribution and/or the context of the data.	X	

**Standards of Mathematical Practice Applied in this Unit**

1. Reason abstractly and quantitatively.
2. Model with mathematics.
3. Use appropriate tools strategically



<b>ENDURING UNDERSTANDINGS:</b> <ul style="list-style-type: none"> <li>Summarize data</li> <li>Evaluate and interpret statistical data</li> <li>Reason statistically</li> </ul>	<b>ESSENTIAL QUESTIONS:</b> <ul style="list-style-type: none"> <li>What does a set of data tell us?</li> <li>What does a set of data not tell us?</li> <li>What is the best way to display a set of data?</li> <li>What is the best way to describe specific data?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	DSP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	
<b>LEARNING OBJECTIVE #1</b>	Identify and write statistical questions.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Statistical question, variability, data, dot plot, quantitative, qualitative</li> </ul>	<ul style="list-style-type: none"> <li>Some questions can be answered using a survey</li> <li>Statistical questions anticipate there will be different answers</li> </ul>	<ul style="list-style-type: none"> <li>Identify statistical questions</li> <li>Write statistical questions</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	DSP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.  DSP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary from a single number  DSP.B.5 Summarize numerical data sets in relation to the context.	
<b>LEARNING OBJECTIVE #2</b>	Summarize data quantitatively and qualitatively	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>mean, median, mode, range, variability, data, distribution, deviation, center, spread, shape, measure of center, measure of variation, mean absolute deviation, quantitative</li> </ul>	<ul style="list-style-type: none"> <li>There is an appropriate time to use each of the different measures of center to describe different types of data</li> <li>A measure of variation describes how its values vary with a single number.</li> </ul>	<ul style="list-style-type: none"> <li>Report the number of observations.</li> <li>Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.</li> <li>Organize data to find quantitative</li> </ul>

	<ul style="list-style-type: none"> <li>Organizing data makes it easier to find measures of central tendency.</li> <li>Data can be described by measures of center, range, and shape created when displayed in graphical form.</li> </ul>	<p>measures of center and variability and describe any overall pattern or striking deviations</p> <ul style="list-style-type: none"> <li>Analyze the choice of measures of center and variability based on the shape of the data distribution and/or the context of the data.</li> <li>Describe data by its center, spread and overall shape</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	DSP.B.4 Display and interpret data.	
<b>LEARNING OBJECTIVE #3</b>	Display and interpret data.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>graphs, dot plot, histogram, box plot, circle graph, interquartile range</li> </ul>	<ul style="list-style-type: none"> <li>Different displays of data are appropriate at different times depending on the information you are trying to present.</li> <li>The message conveyed by the data depends on how the data is collected, represented and summarized</li> <li>Sets of data can only be compared if consistent characteristics exist (scale, type of display, variables, etc)</li> </ul>	<ul style="list-style-type: none"> <li>Use dot plots, histograms and box plots to display and interpret numerical data.</li> <li>Create and interpret circle graphs.</li> <li>Determine the best way to display data.</li> <li>Explain the meaning of the data set by looking at a display of data</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• <a href="#">Performance Task-Baseball Players</a></li> <li>• <a href="#">6th Grade Common Statistical Variability Summative Assessment</a></li> <li>• Common formative assessments, exit slips, observation</li> </ul>	Both Summative Formative	2,3 2,3,4 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Notice similarities and differences in data representations</li> <li>• Collect and analyze data</li> <li>• Cooperative learning</li> <li>• Vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Model with manipulatives</li> <li>• Articulate their thinking through Math Talks</li> </ul>	<ul style="list-style-type: none"> <li>• 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Review prerequisite skills</li> <li>• Reteaching</li> <li>• Extra practice</li> </ul>	<ul style="list-style-type: none"> <li>• Reinforcing skills in small group instruction</li> <li>• Games</li> <li>• Peer tutoring</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• <a href="#">Heat Map STEM Project</a></li> </ul>	<ul style="list-style-type: none"> <li>• Students observe heat maps from NASA to analyze and interpret various sets of data.</li> </ul>	<ul style="list-style-type: none"> <li>• 3, 4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 6th Grade

**TOPIC:** Ratios & Proportional Relationships

**CAREER CONNECTION:** Food service manager, Chef, Construction Workers, Event Planners, Landscape Artists, Surveyor, Engineer, Insurance Sales Agent, Agricultural Workers, Food Scientists

[Weusemath.org](http://www.xpmath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus

**LITERATURE CONNECTION:** *If You Hopped Like a Frog*

**DESCRIPTION:** Understand ratio and rate concepts as comparisons; uses ratio, rate and percent reasoning to solve problems; and uses ratios to convert measurement units to solve problems.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
RP..A.1. Understand and use ratios to solve problems. Understand a ratio as a comparison of two quantities and represent these comparisons.		x
RP.A.2. Understand the concept of a unit rate associated with a ratio, and describe the meaning of unit rate.		x
R.P.A.3 Solve problems involving ratios and rates. a. Create tables of equivalent ratios, find missing values in the tables and plot the pairs of values on the Cartesian coordinate plane. b. Solve unit rate problems. c. Solve percent problems. d. Convert measurement units within and between two systems of measurement.	x	

**Standards of Mathematical Practice Applied in this Unit**

1. Make sense of problems and persevere in solving them
2. Attend to precision
3. Look for and express regularity in repeated reasoning

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>● Be able to use rate to determine best options</li> <li>● Estimate and evaluate reasonable calculations regarding percent</li> <li>● Objects, time, and space can be measured with various units of measurement and these are interchangeable</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>● How does comparing quantities describe the relationship between them?</li> <li>● In proportional relationships, how to quantities change in relationship to each other?</li> <li>● How do I know when a result is reasonable?</li> <li>● How does what I measure influence how I measure?</li> </ul>
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<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	RP.A.1. Understand and use ratios to solve problems. Understand a ratio as a comparison of two quantities and represent these comparisons. Understand the concept of a unit rate associated with a ratio, and describe the meaning of unit rate.	
<b>LEARNING OBJECTIVE #1</b>	I can solve problems including unit rate and relate this to ratio reasoning.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Ratio, Rate, Unit rate, Comparison</li> </ul>	<ul style="list-style-type: none"> <li>● Ratios can represent part to part, part to whole, and whole to part relationships.</li> <li>● A ratio is a comparison between different quantities and a rate is a comparison of the same quantities.</li> <li>● Unit rates can be used to solve a variety of real-world problems.</li> </ul>	<ul style="list-style-type: none"> <li>● Use ratio language to describe comparisons</li> <li>● Compute unit rate</li> <li>● Compare unit rates including speed, cost, time, etc.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	RP.A.2. Solve problems involving ratios and rates.	
<b>LEARNING OBJECTIVE #2</b>	I can solve ratio and rate problems by using ratio tables, equivalent ratios, proportions, percents, and coordinate planes.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Coordinate plane, Proportion, Percent, table, equivalent, ordered pairs, unit rate, convert, measurement</li> </ul>	<ul style="list-style-type: none"> <li>● There is a connection between finding equivalent ratios and finding equivalent fractions.</li> </ul>	<ul style="list-style-type: none"> <li>● Write equivalent ratios</li> <li>● Use tables to compare ratios</li> <li>● Find missing terms in equivalent ratio and</li> </ul>

	<ul style="list-style-type: none"> <li>• Equivalent ratios have proportional relationships.</li> <li>• Ratios can represent part to part, part to whole, and whole to part relationships.</li> <li>• A relationship between ratios can be described by plotting them on the coordinate grid.</li> <li>• A rate is a ratio that compares measurements of different units and can be used to convert these units.</li> </ul>	<p>rate tables</p> <ul style="list-style-type: none"> <li>• Solve percent problems including simple interest, percent increase and decrease and finding the whole when the percent is known.</li> <li>• Plot equivalent rates in the coordinate plane</li> <li>• Convert units of measurement using rate</li> </ul>
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**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• <a href="#">Performance Task- Truffles</a></li> <li>• <a href="#">Performance Task- Candies</a></li> <li>• <a href="#">Performance Task- Sewing</a></li> <li>• <a href="#">6th Grade Common Ratios and Rates Summative Assessment</a></li> <li>• Common formative assessments, exit slips, observation</li> </ul>	Formative Formative Formative Summative Formative	2,3,4 1,2,3 1,2,3 2,3,4 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• Apply previously learned skills like solving equations to solve for proportional relationships</li> <li>• Relate proportional relationships to solving percent problems</li> <li>• Cooperative learning</li> <li>• Vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Model with manipulatives</li> <li>• Articulate their thinking through Math Talks</li> </ul>	<ul style="list-style-type: none"> <li>• 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET 1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Sugar Packets Lesson</a></li> <li>● Reinforcing skills in small group instruction</li> <li>● Games</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET 1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking
<ul style="list-style-type: none"> <li>● <a href="#">Body Ratios Activity</a></li> <li>● <a href="https://www.stem.org.uk/resources/elibrary/resource/33178/ratio-and-proportion">https://www.stem.org.uk/resources/elibrary/resource/33178/ratio-and-proportion</a></li> <li>● <a href="http://www.scholastic.com/unexpectedmath/ratio-challenge/teachers-guide.htm">http://www.scholastic.com/unexpectedmath/ratio-challenge/teachers-guide.htm</a></li> </ul>	<ul style="list-style-type: none"> <li>● This STEM activity will interest students seeking a career in the medical field, sports, or anything dealing with the body. Students look at the ratio of bone lengths and solve for unknowns using proportions.</li> <li>● This activity, from the Institution of Engineering and Technology (IET), helps students develop an understanding of ratio and proportion. This knowledge is applied in subsequent activities when preparing the necessary polymers to be used in the manufacturing of their product and involves calculating how the amounts of ingredients required will change when changing the scale of production. The activity involves exploring what happens if the ratio of water to cornflour is reduced and increased.</li> <li>● The interactive tool enables the student user to construct scale designs of an architectural venue by applying ratio/proportion calculations. Each word problem includes a guiding hint if a student answers incorrectly, and after several tries, an explanation of the correct answer will display. Critical-thinking reflection questions at the end of the user experience will challenge students to draw overarching conclusions about the math concepts and to reflect on the real-world implications.</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3,4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 6th Grade

**TOPIC:** Number Sense & Operations

**CAREER CONNECTION:** Advertising, Marketing, Chef, Accountant, Childcare Worker, Doctor, Firefighter, Astronaut, Photographer, Loan Officer

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus

**LITERATURE CONNECTION:** *Multiplying Menace: The Revenge of Rumpelstiltskin*

**DESCRIPTION:**

Calculate values using the four operations on rational numbers, find least common multiples and greatest common factors, order rational numbers, understand the use of the negative sign and absolute value in terms of the context of problems, and solve problems involving plotting points on the Cartesian coordinate plane.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
NS.A.1 a. Compute and interpret quotients of positive fractions. Solve problems involving division of fractions by fractions.		x
NS.B.2 Demonstrate fluency with division of multi-digit whole numbers.		x
NS.B.3 Demonstrate fluency with addition, subtraction, multiplication and division of decimals.		x
NS.B. 4 Find common factors and multiples. a. Find the greatest common factor (GCF) and the least common multiple (LCM). B. Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers.	x	
NS.C. 5 Use positive and negative numbers to represent quantities.		x
NS. C. 6 Locate a rational number as a point on the number line. a. Locate rational numbers on a horizontal or vertical number line. b. Write, interpret and explain problems of ordering of rational numbers. Understand that a number and its opposite (additive inverse) are located on opposite sides of zero on the number line. Understand that the absolute value of a rational number is its distance from 0 on the number line.		x
NS.C.7 Understand that the absolute value of rational number is its distance from 0 on the number line		X
NS. C. 8 Extend prior knowledge to generate equivalent representations of rational numbers between fractions, decimals and percentages (limited to terminating decimals and/or benchmark fractions of 1/3 and 2/3).	x	



### Standards of Mathematical Practice Applied in this Unit

1. Look for and express regularity in repeated reasoning.
2. Model with mathematics
3. Look for and make use of structure

#### ENDURING UNDERSTANDINGS:

- Numbers are positive and negative and can be ordered and compared.
- People have to determine appropriate methods of computation (mental math, estimation, paper and pencil, calculator) in various situations.
- Number sense develops through experience.

#### ESSENTIAL QUESTIONS:

- How do mathematical operations relate to each other and how do I determine when to use them?
- How does finding the common characteristics among similar problems help me to be a more efficient problem solver?
- Does it make sense to use a fraction, decimal, or percent in a given situation?

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	NS.B.2 Demonstrate fluency with division of multi-digit whole numbers. NS.B.3 Demonstrate fluency with addition, subtraction, multiplication and division of decimals.	
<b>LEARNING OBJECTIVE #1</b>	I can fluently calculate operations with multi-digit whole numbers and decimals.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Algorithm, remainder, decimal, place value</li> <li>● Keywords for operations:               <ul style="list-style-type: none"> <li>○ Addition: sum, total, plus, increase, raise, gain, etc.</li> <li>○ Subtraction: difference, minus, decrease, loss, less, fewer, take away, etc.</li> <li>○ Multiplication: product, multiply, times, double, triple, twice, of, etc.</li> <li>○ Division: quotient, divide, equally, per, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● What happens to the value of a number when it is multiplied and/or divided by a decimal</li> <li>● An answer needs to be logical given the numbers that are being calculated and the context of the problem.</li> <li>● Computational fluency includes understanding not only the meaning but also the appropriate use of numerical operations</li> <li>● Each time you move a decimal point to the left or right, you are multiplying or dividing by a power of 10</li> </ul>	<ul style="list-style-type: none"> <li>● Fluently divide multi-digit numbers using various strategies including the standard algorithm</li> <li>● Fluently multiply and divide multi-digit decimals using various strategies including the standard algorithm</li> <li>● Represent real-world situations involving multiplication and division of decimals</li> <li>● Solve problems by multiplying and dividing decimals</li> <li>● Know when it is appropriate to round decimals and accurately do so.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	NS.C. 1 Use positive and negative numbers to represent quantities. NS. C. 2 Locate a rational number as a point on the number line. NS. C. 3 Extend prior knowledge to generate equivalent representation of rational numbers between fraction, decimals and percentages (limited to terminating decimals and/or benchmark fraction of $\frac{1}{3}$ and $\frac{2}{3}$ )	
<b>LEARNING OBJECTIVE #2</b>	I can represent quantities including positive and negative rational numbers (fractions, decimals, and percents) and locate them on a number line.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Absolute Value, Rational number, fraction, decimal, percent, number line, positive, negative, magnitude, integer, opposites, vertical number line, horizontal number line, order, compare</li> <li>● Key words             <ul style="list-style-type: none"> <li>○ Positive: gain, deposit, increase, above sea level, absolute value, distance, credit, etc.</li> <li>○ Negative: loss, withdrawal, fee, spend, debit, below sea level, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Quantities can be positive or negative in real-world situations</li> <li>● Positive and negative numbers can be located on horizontal and vertical number lines</li> <li>● Proportional reasoning can be used to solve problems involving percents.</li> <li>● Fractions, decimals, and percents can all be used to represent the same quantity</li> <li>● Number lines read left to right (or bottom to top) represent numbers in order from least to greatest</li> <li>● Absolute value is a number's distance from zero on a number line and distance is always positive</li> <li>● Absolute value tells us the magnitude of a quantity</li> </ul>	<ul style="list-style-type: none"> <li>● Use positive and negative numbers to represent quantities in real-world context and include them on number lines</li> <li>● Understand rational numbers as points on the number line.</li> <li>● Order and compare rational numbers</li> <li>● Write inequality statements comparing rational numbers</li> <li>● Convert fractions, decimals, and percents.</li> <li>● Identify the absolute value of a number, and interpret in a given context.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NS.A.1 a. Compute and interpret quotients of positive fractions. Solve problems involving division of fractions by fractions.	
<b>LEARNING OBJECTIVE #3</b>	I can compute and interpret quotients to solve problems involving division of fractions.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Quotients, numerator, denominator, reciprocal, mixed number, improper fraction</li> </ul>	<ul style="list-style-type: none"> <li>Mathematical models can be used to represent real world situations involving fractions.</li> <li>When you divide a whole number amount by a fraction, the quotient is larger than the dividend.</li> </ul>	<ul style="list-style-type: none"> <li>Interpret and compute quotients of fractions</li> <li>Represent situations involving multiplication and division of fractions using models</li> <li>Solve real-world problems involving division of fractions by fractions</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	NS.B. 4 Find common factors and multiples. a. Find the greatest common factor (GCF) and the least common multiple (LCM). b. Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers.	
<b>LEARNING OBJECTIVE #4</b>	I can use greatest common factor and least common multiple to solve problems and use distributive property.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>divisible, distributive property, Greatest common factor (GCF), Least common multiple (LCM), prime factorization, cake/ladder method</li> </ul>	<ul style="list-style-type: none"> <li>Numbers share common factors and multiples</li> <li>LCM and GCF can be used to solve real-world problems</li> <li>Distributive property can be applied to simplify expressions</li> </ul>	<ul style="list-style-type: none"> <li>Find GCF and LCM</li> <li>Solve problems using GCF and LCM</li> <li>Factor an expression using the distributive property and the greatest common factor</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="#">Performance Task- Setting Goals</a></li> <li>● <a href="#">Performance Task- Percent Cards</a></li> <li>● <a href="#">6th Grade Common Fractions Summative Assessment</a></li> <li>● <a href="#">6th Grade Common Decimals Summative Assessment</a></li> <li>● <a href="#">6th Grade Common Rational Numbers Summative Assessment</a></li> <li>● Common formative assessments, exit slips, observation</li> </ul>	Formative Formative Summative Summative Summative Formative	1,2,3 1,2,3 2,3,4 2,3,4 2,3,4 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Solve problems with all types of rational numbers.</li> <li>● Connect the different types of rational numbers by manipulating them, ordering them, and comparing them.</li> <li>● Cooperative learning</li> <li>● Vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>● Model with manipulatives</li> <li>● Use number lines</li> <li>● Articulate their thinking through Math Talks</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Engaging Activities for Review</a></li> <li>● Reinforcing skills in small group instruction</li> <li>● Games</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

<ul style="list-style-type: none"> <li>Peer tutoring</li> <li>Manipulatives</li> </ul>		
<b>HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?</b> <i>Possible Extensions/Enrichments</i>		
TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li><a href="#">Really! I'm Rational Lesson- Understanding Repeating Decimals as Fractions</a></li> <li><a href="https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Calculating_Time_in_Space.html">https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Calculating_Time_in_Space.html</a></li> </ul>	<ul style="list-style-type: none"> <li>Students apply their understanding of changing decimals to fractions in order to understand what repeating decimals would be as fractions.</li> <li>In this video segment, astronaut Eileen Collins on board the space shuttle explains that a successful rendezvous between Russia's Mir space station and the shuttle requires mathematics. Collins asks students to calculate when Mir will reach the rendezvous point. All facts needed for this calculation, including Mir's orbit speed, angle with the equator and current longitude, are given. Animations of Mir's and Earth's movements define the problem of positioning and movement of Mir relative to Earth. Setting up the Mir Rendezvous Positioning Problem and Solution to the Mir Rendezvous Positioning Problem are the video clips that explain the solution. (Note: The Mir space station re-entered Earth's atmosphere in 2001.)</li> </ul>	<ul style="list-style-type: none"> <li>2,3,4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 6th grade

**TOPIC:** Expressions, Equations, and Inequalities

**CAREER CONNECTION:** Computer Systems Manager, Coding, Environmental Scientist, Realtor, Event planner, Computer Programmer, Social Scientist, Pharmacist

**DESCRIPTION:** Write expressions with whole-number exponents; apply properties of operations to write equivalent expressions and equations; write inequalities, given constraints; and represent and analyze relationships between variables.

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus

**LITERATURE CONNECTION:** *Mystery Math: A First Book of Algebra*

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
EEl.A.1 Describe the difference between an expression and an equation.		x
EEl.A.2 Create and evaluate expressions involving variables and whole number exponents. a. Identify parts of an expression using mathematical terminology. b. Evaluate expressions at specific values of the variables. c. Evaluate non-negative rational number expressions. d. Write and evaluate algebraic expressions. e. Understand the meaning		x
EEl.A.3 Identify and generate equivalent algebraic expressions using mathematical properties	x	
EEl.B.4 Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true.		x
EEl.B.5 Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true.		x
EEl.B.6 Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation.	x	
EEl.B.7 Solve one-step linear equations in one variable involving non-negative rational numbers.		x
EEl.B.8 Recognize that inequalities may have infinitely many solutions. a. Write an inequality of the form $x > c$ , $x < c$ , $x \geq c$ , or $x \leq c$ to represent a constraint or condition. b. Graph the solution set of an inequality.	x	
EEl.C.9 Identify and describe relationships between two variables that change in relationship to one another. a. Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. b. Analyze the relationship between the dependent and independent variables using graphs, tables and equations and relate these representations to each other.	x	

### Standards of Mathematical Practice Applied in this Unit

1. Reason abstractly and quantitatively
2. Make sense of problems and persevere in solving them
3. Look for and make use of structure

#### ENDURING UNDERSTANDINGS:

- Algebraic expressions and equations generalize relationships from specific cases.
- Patterns and relationships can be represented numerically, graphically, symbolically, and verbally.
- There is a mathematical order in problem-solving.

#### ESSENTIAL QUESTIONS:

- How can a pattern be expressed to show a relationship?
- How do I use algebraic expressions and equations to analyze or solve problems?
- How is thinking algebraically different from thinking arithmetically.

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	EEI.A.2 Create and evaluate expressions involving variables and whole number exponents. EEI.A.3 Identify and generate equivalent algebraic expressions using mathematical properties	
<b>LEARNING OBJECTIVE #1</b>	I can create and evaluate expression involving variable and whole number exponents using mathematical properties.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Expression</li> <li>● Equation</li> <li>● Variables</li> <li>● Coefficient</li> <li>● Term</li> <li>● Equivalent</li> <li>● Properties</li> </ul>	<ul style="list-style-type: none"> <li>● Algebra is used to represent, understand, and solve real world problems</li> <li>● Expressions can be equivalent because of mathematical properties.</li> <li>● Mathematical models can be used to interpret and predict the relationship between variables.</li> <li>● There is a set system involved in solving math problems and why that system should be followed</li> </ul>	<ul style="list-style-type: none"> <li>● Write and evaluate expressions involving exponents</li> <li>● Use order of operations to simplify numerical expressions that include exponents, parentheses, and multiple operations</li> <li>● Use the mathematical properties to generate equivalent forms for simple algebraic expression</li> <li>● Simplify algebraic expressions by combining the terms.</li> <li>● Use a variable correctly in an expression to represent an unknown amount</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	EEI.A.1 Describe the difference between an expression and an equation. EEI B.1 Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true. EEI.B. 3. Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation. EEI.B.4 Solve one-step linear equations in one variable involving non-negative rational numbers.	
<b>LEARNING OBJECTIVE #2</b>	I can write and solve one-step linear equations using substitution and inverse operations.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>● Substitution, variable, equation, expression, inverse operation, linear</li> </ul>	<ul style="list-style-type: none"> <li>● Equations are comprised of two equivalent expressions using mathematical properties.</li> <li>● Substitution proves that the solution balances the equation.</li> <li>● The steps in solving an equation involve keeping the equation balanced through the use of inverse operations.</li> <li>● An algebraic equation can be written from a real world situation.</li> </ul>	<ul style="list-style-type: none"> <li>● Use mathematical properties to identify balanced equations.</li> <li>● Solve one-step equations involving whole numbers, fractions, and decimals.</li> <li>● Define a variable.</li> <li>● Isolate a variable.</li> <li>● Model real-world problems and solve them using one-step equations.</li> <li>● Use substitution to check my answer.</li> </ul>



<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	EEI B.2 Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true. EEI.B.5 Recognize that inequalities may have infinitely many solutions.	
<b>LEARNING OBJECTIVE #3</b>	I can recognize that there are infinite values to represent solutions for inequalities and graph these solutions.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Inequality, graph, number line, solution, infinite, variable, greater than, less than, greater than or equal to, less than or equal to</li> </ul>	<ul style="list-style-type: none"> <li>• An inequality can represent an infinite solution set</li> <li>• You can determine if a number is a solution to an inequality by using substitution.</li> <li>• Solving an inequality is similar to solving an equation</li> <li>• A number line is a visual representation of an inequality</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate an expression to determine if an inequality is true when given specific values</li> <li>• Represent an inequality on a number line.</li> <li>• Solve a one-step inequality and graph the solution on a number line.</li> <li>• Write a real world example as an inequality</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	EEI.C.1 Identify and describe relationships between two variables that change in relationship to one another.	
<b>LEARNING OBJECTIVE #4</b>	I can write, solve, and graph equations to analyze the relationship between the dependent and independent variable.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>• Equation, independent variable, dependent variable, ordered pair, graph, linear, equation table, x-axis, y-axis, substitution, solution, function</li> </ul>	<ul style="list-style-type: none"> <li>• An algebraic equation can be written from a real world situation.</li> <li>• Graphs, tables, and equations can be used to represent the same situation in various ways</li> <li>• The table, graph and equation represent a pattern in the data</li> <li>• Recognizing the predictable patterns in mathematics allows the creation of functional relationships</li> </ul>	<ul style="list-style-type: none"> <li>• Use variables to write equations representing two real-world quantities that change in relation to one another.</li> <li>• Analyze the relationship between an independent and dependent variable using graphs, tables, and equations.</li> <li>• Find the output or input for a function table, given the other</li> <li>• Write solutions of equations as ordered pairs.</li> <li>• Graph data points on a coordinate plane</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="#">Performance Task- Busy Day</a></li> <li>● <a href="#">Performance Task-Boxes</a></li> <li>● <a href="#">Performance Task- Gym</a></li> <li>● <a href="#">6th Grade Common Expressions Summative Assessment</a></li> <li>● <a href="#">6th Grade Common Equations and Inequalities Summative Assessment</a></li> <li>● Common formative assessments, exit slips, observation</li> </ul>	Formative Formative Formative Summative Summative Formative	1,2,3 1,2,3 1,2,3 2,3,4 2,3,4 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Solve expressions using substitution.</li> <li>● Solve and graph equations and inequalities.</li> <li>● Cooperative learning</li> <li>● Vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>● Model with manipulatives</li> <li>● Use visual models (balance/ scale)</li> <li>● Articulate their thinking through Math Talks</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Engaging Activities for Review</a></li> <li>● Reinforcing skills in small group instruction</li> <li>● Games</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• <a href="#">In and Out Burger Problem</a></li> <li>• <a href="https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Astrobiology_Math.html">https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Astrobiology_Math.html</a></li> </ul>	<ul style="list-style-type: none"> <li>• Find out how much a 100x100 burger costs by forming an expression from the menu.</li> <li>• This collection of activities is based on a weekly series of space science problems intended for students looking for additional challenges in the mathematics and physical science curriculum in grades 6-12. The problems deal with modern science and engineering issues, often involving actual research data.</li> </ul>	<ul style="list-style-type: none"> <li>• 3,4</li> </ul>



**CONTENT AREA:** Mathematics

**COURSE:** 6th Grade

**TOPIC:** Geometry & Measurement

**CAREER CONNECTION:** Architect, Athlete, Fashion Designer, Dancer, Landscaper, Construction Worker, Photographer, Environmentalist, Zoo Keeper, Librarian

[Weusemath.org](http://www.weusemath.org)

[http://www.xpmath.com/careers/math\\_topics.php](http://www.xpmath.com/careers/math_topics.php)

**INSTRUCTIONAL RESOURCES:** Math in Focus

**LITERATURE CONNECTION:** *Sir Cumference and the First Round Table*

**DESCRIPTION:** Solve problems involving the area of polygons and involving the surface area and volume of three-dimensional objects with polygonal faces; represent three-dimensional surfaces using nets; and find lengths of polygonal sides drawn in the Cartesian coordinate plane.

**What We Want Our Students To Know, Understand, and Be Able to Do**

Missouri Learning Standards Addressed in this Unit	PRIORITY	SUPPORTING
GM.A.1 Find the area of polygons by composing or decomposing the shapes into rectangles or triangles	x	
GM.A.2 Find the volume of right rectangular prisms. a. Understand that the volume of a right rectangular prism can be found by filling the prism with multiple layers of the base. b. Apply $V = l * w * h$ and $V = Bh$ to find the volume of right rectangular prisms.		x
GM.A.3 Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane. a. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane b. Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find distances between points with the same first coordinate or the same second coordinate. d. Construct polygons in the Cartesian coordinate plane.		x
GM.A.4 Solve problems using nets. a. Represent three-dimensional figures using nets made up of rectangles and triangles. b. Use nets to find the surface area of three dimensional figures whose sides are made up of rectangles and triangles.	x	

**Standards of Mathematical Practice Applied in this Unit**

1. Use appropriate tools strategically
2. Model with mathematics
3. Reason abstractly and quantitatively

<p><b>ENDURING UNDERSTANDINGS:</b></p> <ul style="list-style-type: none"> <li>Analyzing geometric relationships develops reasoning and justification skills.</li> <li>Geometry and spatial sense offer ways to interpret and reflect on our physical environment.</li> <li>Geometrical shapes can be manipulated to form other geometrical shapes and their characteristics are directly related.</li> </ul>	<p><b>ESSENTIAL QUESTIONS:</b></p> <ul style="list-style-type: none"> <li>How are formulas developed from patterns in geometrical shapes?</li> <li>How do geometric models describe spatial relationships?</li> <li>How can I put shapes together and take them apart to form different shapes?</li> </ul>
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<p><b>REFERENCES/STANDARDS</b> Missouri Learning Standards</p>	<p>GM.A.1 Find the area of polygons by composing or decomposing the shapes into rectangles or triangles GM.A.2 Find the volume of right rectangular prisms.</p>	
<p><b>LEARNING OBJECTIVE #1</b></p>	<p>I can use appropriate measurements to find area, volume, and surface area of various shapes</p>	
<p><b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information,</i> <b>ACADEMIC VOCABULARY</b></p>	<p><b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i></p>	<p><b>I CAN?</b> <i>Skills, Products</i></p>
<ul style="list-style-type: none"> <li>Area, Volume, Formula, Triangle, Rectangle, Parallelogram, Composite Figure, Congruent, Parallelogram, Quadrilaterals, Polygon, Rhombus, Trapezoid, Dimension, Surface Area, Rectangular Prism, Length, Width, Height, Base, Squared, Cubed</li> </ul>	<ul style="list-style-type: none"> <li>The area is the inside/surface of a flat 2D object.</li> <li>Formulas are an efficient tool that can be used to determine the exact area of a 2D object.</li> <li>The area of polygons can be determined by decomposing the polygon into triangles and other shapes</li> <li>Volume measures the number of unit cubes of needed to fill a given space</li> <li>Surface area is the sum of the areas of each individual face of the 3D figure</li> </ul>	<ul style="list-style-type: none"> <li>Find the area of triangles, quadrilaterals, trapezoids, and regular polygons by using formulas and/or decomposing these figures into rectangles or triangles.</li> <li>Find a missing dimension of a plane figure given its area and other dimensions.</li> <li>Find the volume of rectangular prisms</li> <li>Solve real-world problems involving surface area and volume of prisms.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standards	GM.A.3 Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane.	
<b>LEARNING OBJECTIVE #2</b>	I can solve geometrical problems using a coordinate plane.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Coordinate plane, Ordered pairs, Vertex, Distance, Perimeter, Units, Area, Line segment, Reflection</li> </ul>	<ul style="list-style-type: none"> <li>Geometry and spatial sense offer ways to visualize, to interpret, and to reflect on our physical environment.</li> <li>Geometric properties can be used to construct geometric figures</li> <li>The x and y coordinates in the ordered pair determines the location in the quadrants on the coordinate plane</li> <li>The coordinate graph can be used to model and solve real world problems.</li> </ul>	<ul style="list-style-type: none"> <li>Locate points in all four quadrants of the coordinate plane</li> <li>Solve real-world problems by graphing points in all four quadrants of the coordinate plane.</li> <li>Draw polygons in the coordinate plane given the coordinates of the vertices</li> <li>Use coordinates to find the length of horizontal or vertical sides of polygons.</li> </ul>

<b>REFERENCES/STANDARDS</b> Missouri Learning Standard	GM.A.4 Solve problems using nets.	
<b>LEARNING OBJECTIVE #3</b>	I can represent rectangular prisms using nets to solve problems.	
<b>I KNOW?</b> <i>Facts, Names, Dates, Places, Information, ACADEMIC VOCABULARY</i>	<b>I UNDERSTAND?</b> <i>Concepts; essential truths that give meaning to the topic; ideas that transfer across situations</i>	<b>I CAN?</b> <i>Skills, Products</i>
<ul style="list-style-type: none"> <li>Nets, Rectangular Prism. Surface Area,</li> </ul>	<ul style="list-style-type: none"> <li>Two dimensional figures can be used to represent three dimensional objects.</li> <li>Three-dimensional figures can be “unfolded” into flat 2D shapes (nets) which can then be used to find the surface area.</li> </ul>	<ul style="list-style-type: none"> <li>Represent prisms using nets</li> <li>Use nets to find surface areas</li> </ul>

**HOW WE WILL KNOW WHAT OUR STUDENTS HAVE LEARNED**

<b>ASSESSMENT DESCRIPTION</b> Performance task or other evidence Unit assessment, pre-post tests, performance based assessments, progress monitoring assessment	<b>FORMATIVE OR SUMMATIVE?</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● <a href="#">Performance Task-Building Blocks</a></li> <li>● <a href="#">Performance Task- Painting a Barn</a></li> <li>● <a href="#">6th Grade Common Geometry Summative Assessment</a></li> <li>● Common formative assessments, exit slips, observation</li> </ul>	Formative Formative Summative Formative	1,2,3 1,2,3 2,3,4 1,2,3

**LEARNING EXPERIENCES - STRATEGIES AND METHODS FOR TEACHING AND LEARNING**

*Research based instructional strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Solve real world problems using geometry.</li> <li>● Apply previous equation skills to solve for unknowns.</li> <li>● Cooperative learning</li> <li>● Vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>● Model with manipulatives</li> <li>● Use visual models (figures, coordinate planes)</li> <li>● Articulate their thinking through Math Talks</li> </ul>	<ul style="list-style-type: none"> <li>● 2,3,4</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE NOT LEARNED?**

*Possible Interventions or differentiation strategies*

<b>TEACHER INSTRUCTIONAL ACTIVITY</b>	<b>STUDENT LEARNING TASK</b>	<b>DOK TARGET</b> (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>● Review prerequisite skills</li> <li>● Reteaching</li> <li>● Extra practice</li> <li>● Peer tutoring</li> <li>● Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>● <a href="#">Carousel Rotations</a></li> <li>● Reinforcing skills in small group instruction</li> <li>● Games</li> </ul>	<ul style="list-style-type: none"> <li>● 1,2,3</li> </ul>

**HOW WILL WE RESPOND IF STUDENTS HAVE ALREADY LEARNED?**

*Possible Extensions/Enrichments*

TEACHER INSTRUCTIONAL ACTIVITY	STUDENT LEARNING TASK	DOK TARGET (1=Recall, 2=Skill/Concept, 3=Strategic Thinking, 4=Extended Thinking)
<ul style="list-style-type: none"> <li>• <a href="#">That's A Lot of Money!</a></li> <li>• <a href="https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/YOSS_Collisions_Craters_in_Solar_System.html">https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/YOSS_Collisions_Craters_in_Solar_System.html</a></li> </ul>	<ul style="list-style-type: none"> <li>• Students extend their knowledge of volume to figure out how much money was obtained illegally.</li> </ul> <p><i>**Note: The video associated with this problem mentions a drug related crime. You can change the story instead of showing the video to make it a bank robbery or something more appropriate.</i></p> <ul style="list-style-type: none"> <li>• <a href="https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/YOSS_Collisions_Craters_in_Solar_System.html">https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/YOSS_Collisions_Craters_in_Solar_System.html</a></li> </ul>	<ul style="list-style-type: none"> <li>• 3, 4</li> </ul>