Mathematics Curriculum:
Grade Five

COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

The following maps outline the Common Core Standards for grade five mathematics determined by the State Standards Initiative. Below is a list of assessment tools that are recommended for tracking student progress in these areas. In addition, resources that can be used in conjunction with instruction of these standards are provided but not limited to the list below.

Assessment:

Formative Assessments	Class-Work Review	Summative Assessments	Benchmark Assessments
Open-Ended Problems	Project-Based Assessments	Group & Cooperative Work	Math Software
Self-Assessment	Timed Drills	Homework Review	End of Year Assessment
Teacher Observations			

Resources:

Time Bingo	Protractors	Tangrams	Flashcards	Mini White Boards
Ten Frame	Geometric Shapes	Math Word Wall	Blocks	Judy Clock
Geo-Board	Tens Frame	Analog Clock	Math/Pocket Charts	Small Student Clocks
Connecting Cubes	Calendar	Textbooks	Math Journals	Center Activities
Number Line	100 Chart	Attribute Blocks	Digital Clock	Mini White Boards
Work Mats	Math Songs/Poems	Craft Sticks	Manipulatives	Three-Dimensional Shapes
Computer Software	Calculators	Wiki-Sticks	Base Ten Blocks	Measurement Tools
Interactive White Board	Money/Coins	Pattern Blocks		

Websites:

http://www.aplusmath.com
http://www.studyisland.com
http://www.funbrain.com
http://www.songsforteaching.com

Reference: http://www.ade.az.gov/standards/math/2010MathStandards

Footnotes Explained:

1. Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

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Essential Question(s): How do students use computational strategies effectively?

21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Skills: Critical Thinking and Problem Solving

Content: Operations & Algebraic Thinking

Standards: 5. OA

A. Write and interpret numerical expressions.

Vocabulary: algebraic expression, parentheses, brackets, braces, numerical expression, equation, evaluate, variable

Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	• Introduce grouping symbols and how to use them • Model evaluating expression with these symbols • Create situations to represent certain expressions.	This standard builds on the expectations of third grade where students are expected to start learning the conventional order. Students need experiences with multiple expressions that use grouping symbols throughout the year to develop understanding of when and how to use parentheses, brackets, and braces. First, students use these symbols with whole numbers. Then the symbols can be used as students add, subtract, multiply and divide decimals and fractions. Examples: • (26 + 18) ÷ 4 Answer: 11 • {[2 x (3+5)] – 9} + [5 x (23-18)] Answer: 32 • 12 – (0.4 x 2) Answer: 11.2 • (2 + 3) x (1.5 – 0.5) Answer: 5 • $6-\left(\frac{1}{2}+\frac{1}{3}\right)$ Answer: 5 1/6 • { 80 ÷ [2 x (3 ½ + 1 ½)] }+ 100 Answer: 108 To further develop students' understanding of grouping symbols and facility with operations, students place grouping symbols in equations to make the equations true or they compare expressions that are grouped differently. Examples: • 15 - 7 – 2 = 10 → 15 - (7 – 2) = 10 • 3 x 125 ÷ 25 + 7 = 22 → [3 x (125 ÷ 25)] + 7 = 22 • 24 ÷ 12 ÷ 6 ÷ 2 = 2 x 9 + 3 ÷ ½ → 24 ÷ [(12 ÷ 6) ÷ 2] = (2 x 9) + (3 ÷ ½) • Compare 3 x 2 + 5 and 3 x (2 + 5) • Compare 15 – 6 + 7 and 15 – (6 + 7)	Language Art: Math Journal- have students write multi-step real world problems that can be described by the given algebraic expression

2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	• Write a numerical expression to show how numbers in a situation are related. • Recognize relationships between words and algebraic expressions.	Students use their understanding of operations and grouping symbols to write expressions and interpret the meaning of a numerical expression. Examples: • Students write an expression for calculations given in words such as "divide 144 by 12, and then subtract 7/8." They write (144 ÷ 12) – 7/8. • Students recognize that 0.5 x (300 ÷ 15) is ½ of (300 ÷ 15) without calculating the quotient.	

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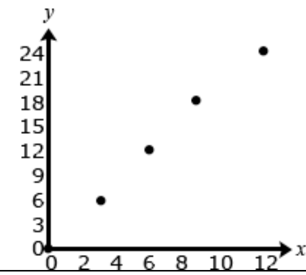
Essential Question(s): How can graphs or visual tools represent the relationship between patterns?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Operations & Algebraic Thinking			
Standards: 5. OA			
B. Analysis patterns and relationships.			
Vocabulary: coordinate plane, graphing, ordered pairs, x-axis, y-axis, sequence, terms			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	• Find rules to complete number patterns • Identify apparent relationships between corresponding terms • Form ordered pairs consisting of corresponding terms from two patterns • Plot points on a coordinate grid.	Example: Use the rule "add 3" to write a sequence of numbers. Starting with a 0, students write 0, 3, 6, 9, 12, . . . Use the rule "add 6" to write a sequence of numbers. Starting with 0, students write 0, 6, 12, 18, 24, . . . After comparing these two sequences, the students notice that each term in the second sequence is twice the corresponding terms of the first sequence. One way they justify this is by describing the patterns of the terms. Their justification may include some mathematical notation (See example below). A student may explain that both sequences start with zero and to generate each term of the second sequence he/she added 6, which is twice as much as was added to produce the terms in the first sequence. Students may also use the distributive property to describe the relationship between the two numerical patterns by reasoning that 6 + 6 + 6 = 2 (3 + 3 + 3). 0, $^{+3}$ 3, $^{+3}$ 6, $^{+3}$ 9, $^{+3}$12, . . . 0, $^{+6}$ 6, $^{+6}$ 12, $^{+6}$18, $^{+6}$ 24, . . . Once students can describe that the second sequence of numbers is twice the corresponding terms of the first sequence, the terms can be written in ordered pairs and then graphed on a coordinate grid. They should recognize that each point on the graph represents two quantities in which the second quantity is twice the first quantity.	Art: Plot points on grid to create a picture

		<u>Ordered pairs</u> (0, 0) (3, 6) (6, 12) (9, 18) (12, 24) 	

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Grade Five

Essential Question(s): How can place value be used to represent whole numbers and decimals?

21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy

21st Century Skills: Critical Thinking and Problem Solving

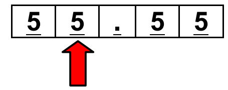
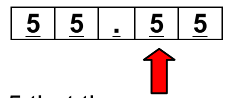
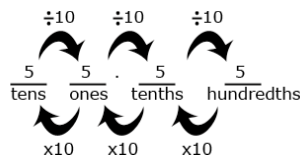
Content: Numbers and Operations in Base Ten

Standards: 5. NBT

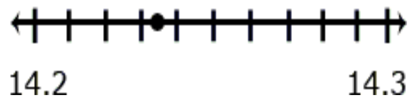
A. Understand the place value system.

Vocabulary: word form, expanded form, standard form, place value, value, whole numbers, decimals, greater than, less than, equal to, period, exponents, powers of 10, benchmark, fraction

Skills	Instructional Procedures	Explanations and Examples	Interdisciplinary Connections
1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	• Explain and apply why the value of a digit changes when the place value changes.	In fourth grade, students examined the relationships of the digits in numbers for whole numbers only. This standard extends this understanding to the relationship of decimal fractions. Students use base ten blocks, pictures of base ten blocks, and interactive images of base ten blocks to manipulate and investigate the place value relationships. They use their understanding of unit fractions to compare decimal places and fractional language to describe those comparisons. Before considering the relationship of decimal fractions, students express their understanding that in multi-digit whole numbers, 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. A student thinks, "I know that in the number 5555, the 5 in the tens place (5555) represents 50 and the 5 in the hundreds place (5555) represents 500. So a 5 in the hundreds place is ten times as much as a 5 in the tens place or a 5 in the tens place is 1/10 of the value of a 5 in the hundreds place. To extend this understanding of place value to their work with decimals, students use a model of one unit; they cut it into 10 equal pieces, shade in, or describe 1/10 of that model using fractional language ("This is 1 out of 10 equal parts. So it is 1/10". I can write this using 1/10 or 0.1"). They repeat the process by finding 1/10 of a 1/10 (e.g., dividing 1/10 into 10 equal parts to arrive at 1/100 or 0.01) and can explain their reasoning, "0.01 is 1/10 of 1/10 thus is 1/100 of the whole unit."	Language Arts: Read The History of Counting by Denise Shmandt-Besserat Science: Review with students the names of the planets in order of increasing distance from the sun. Have students write each measurement in word form and expanded form.

		In the number 55.55, each digit is 5, but the value of the digits is different because of the placement.  The 5 that the arrow points to is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the ones place is 1/10 of 50 and 10 times five tenths.  The 5 that the arrow points to is 1/10 of the 5 to the left and 10 times the 5 to the right. The 5 in the tenths place is 10 times five hundredths.  	
2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	• Use place value to find an algorithm that can be used to multiply or divide numbers by a power of 10 using whole number exponents to denote the power of ten.	Examples: Students might write: • $36 \times 10 = 36 \times 10^1 = 360$ • $36 \times 10 \times 10 = 36 \times 10^2 = 3600$ • $36 \times 10 \times 10 \times 10 = 36 \times 10^3 = 36,000$ • $36 \times 10 \times 10 \times 10 \times 10 = 36 \times 10^4 = 360,000$ Students might think and/or say: • I noticed that every time, I multiplied by 10 I added a zero to the end of the number. That makes sense because each digit's value became 10 times larger. To make a digit 10 times larger, I have to move it one place value to the left. • When I multiplied 36 by 10, the 30 became 300. The 6 became 60 or the 36 became 360. So I had to add a zero at the end to have the 3 represent 3 one-hundreds (instead of 3 tens) and the 6 represents 6 tens (instead of 6 ones). Students should be able to use the same type of reasoning as above to explain why the following multiplication and division problem by powers of 10 make sense. • $523 \times 10^3 = 523,000$ The place value of 523 is increased by 3 places. • $5.223 \times 10^2 = 522.3$ The place value of 5.223 is increased by 2 places.	Language Arts: The Great Number Rumble: A Story of Math in Surprising Places by Cora Lee and Gillian O' Rielly- The story presents a myriad of ways math affects us in our everyday life.

		• $52.3 \div 10^1 = 5.23$ The place value of 52.3 is decreased by one place.	
3. Read, write, and compare decimals to thousandths. • Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). • Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	• Read and write decimals through thousandths • Compose and order decimals using the expanded form and benchmarks to determine <, >, = • Identify relationships between fractions and decimals	Students build on the understanding they developed in fourth grade to read, write, and compare decimals to thousandths. They connect their prior experiences with using decimal notation for fractions and addition of fractions with denominators of 10 and 100. They use concrete models and number lines to extend this understanding to decimals to the thousandths. Models may include base ten blocks, place value charts, grids, pictures, drawings, manipulatives, technology-based, etc. They read decimals using fractional language and write decimals in fractional form, as well as in expanded notation as show in the standard 3a. This investigation leads them to understanding equivalence of decimals (0.8 = 0.80 = 0.800). Example: Some equivalent forms of 0.72 are: 72/100 70/100 + 2/100 7/10 + 2/100 0.720 7 x (1/10) + 2 x (1/100) 7 x (1/10) + 2 x (1/100) + 0 x (1/1000) 0.70 + 0.02 720/1000 Students need to understand the size of decimal numbers and relate them to common benchmarks such as 0, 0.5 (0.50 and 0.500), and 1. Comparing tenths to tenths, hundredths to hundredths, and thousandths to thousandths is simplified if students use their understanding of fractions to compare decimals. Example: Comparing 0.25 and 0.17, a student might think, “25 hundredths is more than 17 hundredths”. They may also think that it is 8 hundredths more. They may write this comparison as 0.25 > 0.17 and recognize that 0.17 < 0.25 is another way to express this comparison. Comparing 0.207 to 0.26, a student might think, “Both numbers have 2 tenths, so I need to compare the hundredths. The second number has 6 hundredths and the first number has no hundredths so the second number must be larger. Another student might think while writing fractions, “I know that 0.207 is 207 thousandths (and may write 207/1000). 0.26 is 26 hundredths (and may write 26/100) but I can also think of it as 260 thousandths (260/1000). So, 260 thousandths is more than 207 thousandths.	Science: The speed of sound is 767.58 miles per hour. Have students research vehicles that have traveled faster than the speed of sound, such as airplane, rockets and even cars. Have students present their reports to the class. Encourage them to include visuals with their reports.
4. Use place value understanding to round decimals to any place.	• Recognize, compare, and round decimals using place value and benchmarks.	When rounding a decimal to a given place, students may identify the two possible answers, and use their understanding of place value to compare the given number to the possible answers.	

		Example: Round 14.235 to the nearest tenth. • Students recognize that the possible answer must be in tenths thus, it is either 14.2 or 14.3. They then identify that 14.235 is closer to 14.2 (14.20) than to 14.3 (14.30).  	

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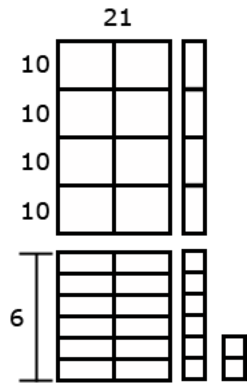
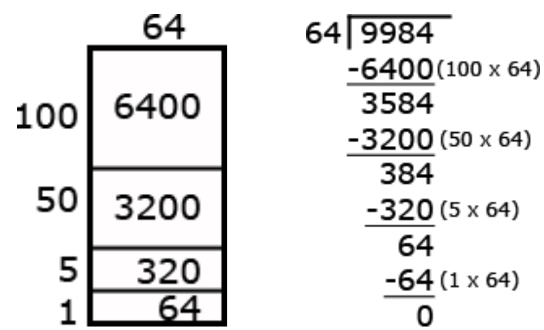
Grade Five

Essential Question(s): How is the standard algorithm used to multiply multi-digit whole numbers? How do you use properties of operations and other strategies to find whole number quotients? How do you use properties of operations and other strategies to add, subtract, multiply and divide decimals?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Numbers and Operations in Base Ten			
Standards: 5. NBT			
B. Perform operations with multi-digit whole numbers and with decimals to the hundredths.			
Vocabulary: algorithm, sum, difference, products, quotients			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
5. Fluently multiply multi-digit whole numbers using the standard algorithm.	• Use the standard algorithm to multiply a multi-digit whole number by a two-digit number	In prior grades, students used various strategies to multiply. Students can continue to use these different strategies as long as they are efficient, but must also understand and be able to use the standard algorithm. In applying the standard algorithm, students recognize the importance of place value. Example: 123 x 34 When students apply the standard algorithm, they decompose 34 into 30 + 4. Then they multiply 123 by 4, the value of the number in the ones place, and then multiply 123 by 30, the value of the 3 in the tens place, and add the two products.	<u>Science:</u> Research the approximate length of one day on each planet in "earth day" then convert to the number or earth hours.

6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	• Divide up to four –digit dividends by two-digit divisors with the regrouping with or without remainders using properties of operations, area models or the standard algorithm, which is not required in this standard.	In fourth grade, students' experiences with division were limited to dividing by one-digit divisors. This standard extends students' prior experiences with strategies, illustrations, and explanations. When the two-digit divisor is a "familiar" number, a student might decompose the dividend using place value.
		
		Example:
		• Using expanded notation ~ 2682 ÷ 25 = (2000 + 600 + 80 + 2) ÷ 25
		• Using his or her understanding of the relationship between 100 and 25, a student might think ~
		   ○ I know that 100 divided by 25 is 4 so 200 divided by 25 is 8 and 2000 divided by 25 is 80.
		   ○ 600 divided by 25 has to be 24.
		   ○ Since 3 x 25 is 75, I know that 80 divided by 25 is 3 with a reminder of 5. (Note that a student might divide into 82 and not 80)
		   ○ I can't divide 2 by 25 so 2 plus the 5 leaves a remainder of 7.
		   ○ 80 + 24 + 3 = 107. So, the answer is 107 with a remainder of 7.
			<u>Science:</u>
			Elephants eat 300 lbs. of food each day. Elephants spend at least 16 hours per day eating. Have students make a table showing how much food elephants each day, week, month and year. Then have them do the same for the number of hours elephants spend eating during each time period.

		Using an equation that relates division to multiplication, 25 x *n* = 2682, a student might estimate the answer to be slightly larger than 100 because s/he recognizes that 25 x 100 = 2500. Example: 968 ÷ 21 • Using base ten models, a student can represent 962 and use the models to make an array with one dimension of 21. The student continues to make the array until no more groups of 21 can be made. Remainders are not part of the array.  Example: 9984 ÷ 64 • An area model for division is shown below. As the student uses the area model, s/he keeps track of how much of the 9984 is left to divide. 	
7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or	• Use rounding to estimate sum, differences, products and quotients. • Add and subtract decimals to hundredths using concrete models	This standard requires students to extend the models and strategies they developed for whole numbers in grades 1-4 to decimal values. Before students are asked to give exact answers, they should estimate answers based on their understanding of operations and the value of the numbers. Examples: • 3.6 + 1.7	Science: Research the maximum speed of three different animals. Find the distance they will travel in 3 hours, 4 hours, 5 hours etc. Have

<table>
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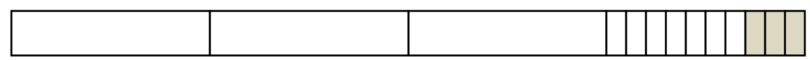
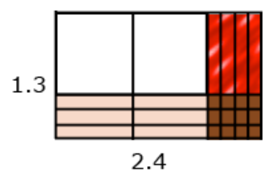
<td>drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</td>
<td>• Multiply and divide decimals to hundredths using partial products, and area models.</td>
<td>

A student might estimate the sum to be larger than 5 because 3.6 is more than 3 ½ and 1.7 is more than 1 ½.

5.4 – 0.8
A student might estimate the answer to be a little more than 4.4 because a number less than 1 is being subtracted.
6 x 2.4
A student might estimate an answer between 12 and 18 since 6 x 2 is 12 and 6 x 3 is 18. Another student might give an estimate of a little less than 15 because s/he figures the answer to be very close, but smaller than 6 x 2 ½ and think of 2 ½ groups of 6 as 12 (2 groups of 6) + 3 (½ of a group of 6).

Students should be able to express that when they add decimals they add tenths to tenths and hundredths to hundredths. So, when they are adding in a vertical format (numbers beneath each other), it is important that they write numbers with the same place value beneath each other. This understanding can be reinforced by connecting addition of decimals to their understanding of addition of fractions. Adding fractions with denominators of 10 and 100 is a standard in fourth grade.

Example: 4 - 0.3
3 tenths subtracted from 4 wholes. The wholes must be divided into tenths.

The answer is 3 and 7/10 or 3.7.
Example: An area model can be useful for illustrating products.


2.4
<u>x 1.3</u>
.12
.60
.40
<u>+ 2.00</u>
3.12

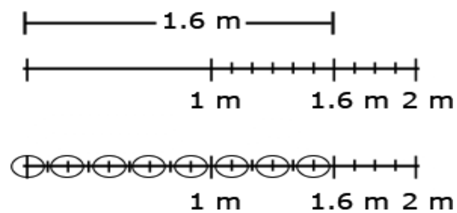
Students should be able to describe the partial products displayed by the area model. For example,
“3/10 times 4/10 is 12/100.
3/10 times 2 is 6/10 or 60/100.
1 group of 4/10 is 4/10 or 40/100.
1 group of 2 is 2.”

Example of division: finding the number in each group or share
Students should be encouraged to apply a fair sharing model separating decimal values into equal parts such as $2.4 \div 4 = 0.6$
</td>
<td>students estimate how long it will take them to travel x miles.

<u>Technology:</u> Create models using Interactive Whiteboard software (such as SMART Notebook)</td>
</tr>
</table>

Example of division: find the number of groups

- Joe has 1.6 meters of rope. He has to cut pieces of rope that are 0.2 meters long. How many can he cut?
- To divide to find the number of groups, a student might
  - draw a segment to represent 1.6 meters. In doing so, s/he would count in tenths to identify the 6 tenths, and be able identify the number of 2 tenths within the 6 tenths. The student can then extend the idea of counting by tenths to divide the one meter into tenths and determine that there are 5 more groups of 2 tenths.



  - count groups of 2 tenths without the use of models or diagrams. Knowing that 1 can be thought of as 10/10, a student might think of 1.6 as 16 tenths. Counting 2 tenths, 4 tenths, 6 tenths, . . .16 tenths, a student can count 8 groups of 2 tenths.
  - Use their understanding of multiplication and think, “8 groups of 2 is 16, so 8 groups of 2/10 is 16/10 or 1 6/10.”

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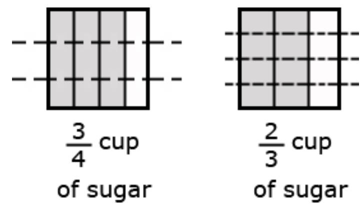
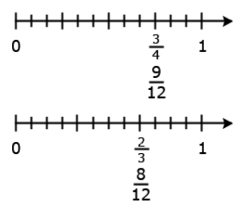
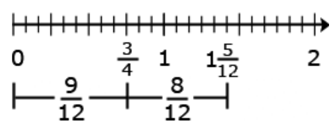
Essential Question(s): How are equivalent fractions used as a strategy to add and subtract fractions? How knowledge of fractions be used to solve problems?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Number and Operations- Fractions			
Standards: 5. NF			
A. Use equivalent fractions as a strategy to add and subtract fractions.			
Vocabulary: numerator, denominator, common denominator, equivalent fraction, least common denominator (lcd), least common multiple (lcm), sum, difference			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**

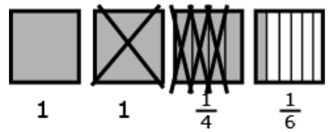
1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	• Review fraction concepts
	  ○ Equivalent fractions (use lcm)
	  ○ Simplest form
	  ○ Mixed numbers
	  ○ Compare and order factions and mixed numbers
	  ○ Add and subtract like fractions
	  ○ Use common denominators
	
	• Use least common denominator
	• Add and subtract unlike fractions
	• Add and subtract mixed numbers
		Students should apply their understanding of equivalent fractions developed in fourth grade and their ability to rewrite fractions in an equivalent form to find common denominators. They should know that multiplying the denominators will always give a common denominator but may not result in the smallest denominator.
		Examples:
		• $\frac{2}{5}+\frac{7}{8}=\frac{16}{40}+\frac{35}{40}=\frac{51}{40}$
		• $3\frac{1}{4}-\frac{1}{6}=3\frac{3}{12}-\frac{2}{12}=3\frac{1}{12}$
			<u>Science:</u>
			Measuring fractions of a whole
			<u>Social Studies:</u>
			Calendar

2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	• Solve word problems involving addition and subtraction of fractions with like denominators • Provide visual representations to solve word problems	Examples: Jerry was making two different types of cookies. One recipe needed ¾ cup of sugar and the other needed $^2/_3$ cup of sugar. How much sugar did he need to make both recipes? • Mental estimation: ○ A student may say that Jerry needs more than 1 cup of sugar but less than 2 cups. An explanation may compare both fractions to ½ and state that both are larger than ½ so the total must be more than 1. In addition, both fractions are slightly less than 1 so the sum cannot be more than 2. • Area model  $\frac{3}{4}=\frac{9}{12}$ $\frac{2}{3}=\frac{8}{12}$ $\frac{3}{4}+\frac{2}{3}=\frac{17}{12}=\frac{12}{12}+\frac{5}{12}=1\frac{5}{12}$ • Linear model  Solution:  Example: Using a bar diagram • Sonia had 2 1/3 candy bars. She promised her brother that she would give him ½ of a candy bar. How much will she have left after she gives her brother the amount she promised?	Career and Life Skills: Cooking

- If Mary ran 3 miles every week for 4 weeks, she would reach her goal for the month. The first day of the first week she ran 1 ¾ miles. How many miles does she still need to run the first week?
  - Using addition to find the answer:1 ¾ + n = 3
  - A student might add 1 ¼ to 1 ¾ to get to 3 miles. Then he or she would add 1/6 more. Thus 1 ¼ miles + 1/6 of a mile is what Mary needs to run during that week.

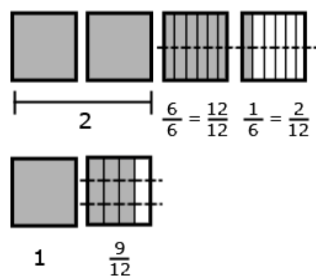
Example: Using an area model to subtract

- This model shows 1 ¾ subtracted from 3 1/6 leaving 1 + ¼ + 1/6 which a student can then change to 1 + 3/12 + 2/12 = 1 5/12.



  $3\ ^{1}/_{6}$ and 1 ¾ can be expressed with a denominator of 12. Once this is done a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.

- This diagram models a way to show how $3\ ^{1}/_{6}$ and 1 ¾ can be expressed with a denominator of 12. Once this is accomplished, a student can complete the problem, 2 14/12 – 1 9/12 = 1 5/12.

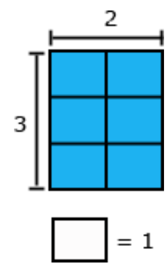
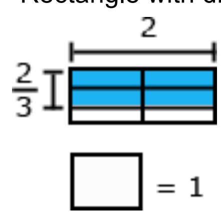
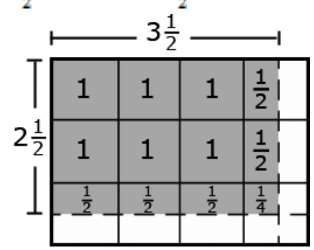


Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations and can be supported through the use of physical models.

		Example: • Elli drank $\frac{3}{5}$ quart of milk and Javier drank $\frac{1}{10}$ of a quart less than Ellie. How much milk did they drink all together? Solution: • $\frac{3}{5} - \frac{1}{10} = \frac{6}{10} - \frac{1}{10} = \frac{5}{10}$ This is how much milk Javier drank • $\frac{3}{5} + \frac{5}{10} = \frac{6}{10} + \frac{5}{10} = \frac{11}{10}$ Together they drank $1\frac{1}{10}$ quarts of milk This solution is reasonable because Ellie drank more than ½ quart and Javier drank ½ quart so together they drank slightly more than one quart.	

Math Curriculum
Grade Five

Essential Question(s): How do we apply and extend understandings of multiplication and division to multiply and divide fractions?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy, Career and Life Skills			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Numbers and Operations-Fractions			
Standards: 5. NF			
B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.			
Vocabulary: quotient, reciprocal, product, scale , array			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	• Solve word problems involving division of whole numbers using visual models • Explain and model that a fraction line is a division line	Students are expected to demonstrate their understanding using concrete materials, drawing models, and explaining their thinking when working with fractions in multiple contexts. They read 3/5 as “three fifths” and after many experiences with sharing problems, learn that 3/5 can also be interpreted as “3 divided by 5.” Examples: • Ten team members are sharing 3 boxes of cookies. How much of a box will each student get? ○ When working this problem a student should recognize that the 3 boxes are being divided into 10 groups, so s/he is seeing the solution to the following equation, 10 x *n* = 3 (10 groups of some amount is 3 boxes) which can also be written as n = 3 ÷ 10. Using models or diagram, they divide each box into 10 groups, resulting in each team member getting 3/10 of a box. • Two afterschool clubs are having pizza parties. For the Math Club, the teacher will order 3 pizzas for every 5 students. For the student council, the teacher will order 5 pizzas for every 8 students. Since you are in both groups, you need to decide which party to attend. How much pizza would you get at each party? If you want to have the most pizza, which party should you attend? • The six fifth grade classrooms have a total of 27 boxes of pencils. How many boxes will each classroom receive? Students may recognize this as a whole number division problem but should also express this equal sharing problem as $^{27}/_{6}$. They explain that each classroom gets $^{27}/_{6}$ boxes of pencils and can further determine that each classroom get 4 $^{3}/_{6}$ or 4 $^{1}/_{2}$ boxes of pencils.	

4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. • Interpret the product (*a*/*b*) × *q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* • Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	• Multiply a fraction by a fraction • Multiply a fraction by a whole number • Create visual representation of word problems • Create visual fraction chart to represent length times width (area)	Students are expected to multiply fractions including proper fractions, improper fractions, and mixed numbers. They multiply fractions efficiently and accurately as well as solve problems in both contextual and non-contextual situations. As they multiply fractions such as 3/5 x 6, they can think of the operation in more than one way. ○ 3 x (6 ÷ 5) or (3 x 6/5) ○ (3 x 6) ÷ 5 or 18 ÷ 5 (18/5) Students create a story problem for 3/5 x 6 such as, • Isabel had 6 feet of wrapping paper. She used 3/5 of the paper to wrap some presents. How much does she have left? • Every day Tim ran 3/5 of mile. How far did he run after 6 days? (Interpreting this as 6 x 3/5) Examples: Building on previous understandings of multiplication • Rectangle with dimensions of 2 and 3 showing that 2 x 3 = 6.  • Rectangle with dimensions of 2 and $\frac{2}{3}$ showing that 2 x 2/3 = 4/3  • $2\frac{1}{2}$ groups of $3\frac{1}{2}$: 	<u>Language Arts:</u> Students create word problems

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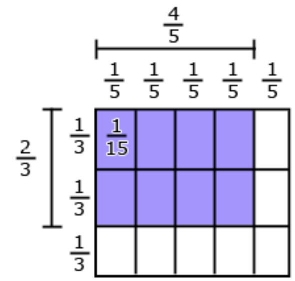
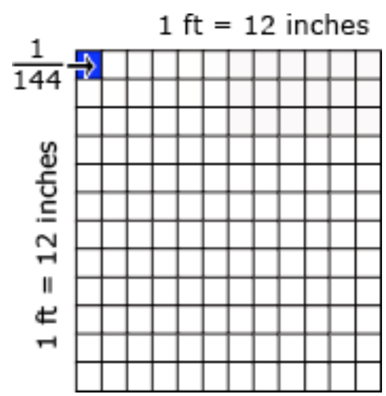
- In solving the problem $\frac{2}{3} \times \frac{4}{5}$, students use an area model to visualize it as a 2 by 4 array of small rectangles each of which has side lengths 1/3 and 1/5. They reason that 1/3 x 1/5 = 1/(3 x 5) by counting squares in the entire rectangle, so the area of the shaded area is (2 x 4) x 1/(3 x 5) = $\frac{2 \times 4}{3 \times 5}$. They can explain that the product is less than $\frac{4}{5}$ because they are finding $\frac{2}{3}$ of $\frac{4}{5}$. They can further estimate that the answer must be between $\frac{2}{5}$ and $\frac{4}{5}$ because $\frac{2}{3}$ of $\frac{4}{5}$ is more than $\frac{1}{2}$ of $\frac{4}{5}$ and less than one group of $\frac{4}{5}$.



The area model and the line segments show that the area is the same quantity as the product of the side lengths.

- Larry knows that $\frac{1}{12} \times \frac{1}{12}$ is $\frac{1}{144}$. To prove this he makes the following array.



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<tr>
<td>5. Interpret multiplication as scaling (resizing) by:

• Comparing the size of a product to the size of one factor on the basis of the</td>
<td>• Use visual representation to demonstrate parts of a whole. For example 4 quarters = 1 dollar, 3 quarters is ¾
• Use visual representation to find patterns when</td>
<td>Examples:

• $\frac{3}{4} \times 7$ is less than 7 because 7 is multiplied by a factor less than 1 so the product must be less than 7.</td>
<td><u>Social Studies/ Economics:</u>
Money
Scales on a map</td>
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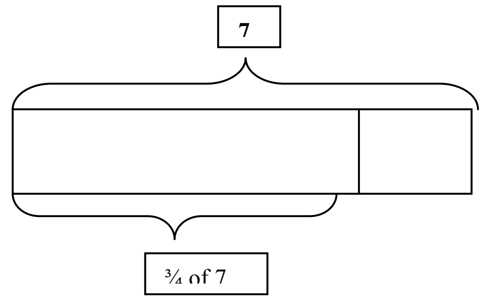
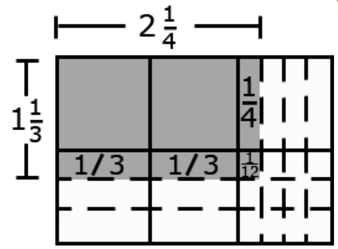
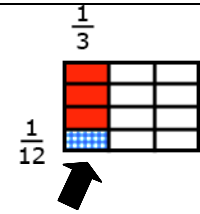
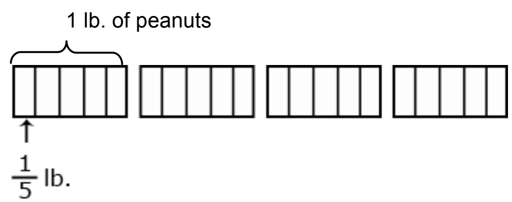
size of the other factor, without performing the indicated multiplication. • Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	multiplying whole numbers by fractions greater than or less than 1	 • $2\frac{2}{3}$ x 8 must be more than 8 because 2 groups of 8 is 16 and $2\frac{2}{3}$ is almost 3 groups of 8. So the answer must be close to, but less than 24. • $\frac{3}{4} = \frac{5 \text{ X } 3}{5 \text{ X } 4}$ because multiplying $\frac{3}{4}$ by $\frac{5}{5}$ is the same as multiplying by 1.	

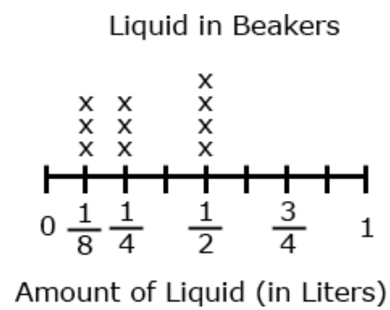
6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	• Solve word problems involving multiplication of a fraction by mixed numbers
	• Provide visual representation for word problems
		Examples:
		• Evan bought 6 roses for his mother. $\frac{2}{3}$ of them were red. How many red roses were there?
		  • Using a visual, a student divides the 6 roses into 3 groups and counts how many are in 2 of the 3 groups.
		
		  • A student can use an equation to solve.
		$\frac{2}{3} \times 6 = \frac{12}{3} = 4$ red roses
		• Mary and Joe determined that the dimensions of their school flag needed to be $1\frac{1}{3}$ ft. by $2\frac{1}{4}$ ft. What will be the area of the school flag?
			<u>Language Arts:</u>
			Write word problems
			<u>Art:</u>
			Create visual representation of word problem

		• A student can draw an array to find this product and can also use his or her understanding of decomposing numbers to explain the multiplication. Thinking ahead a student may decide to multiply by $1\frac{1}{3}$ instead of $2\frac{1}{4}$.  The explanation may include the following: • First, I am going to multiply $2\frac{1}{4}$ by 1 and then by $\frac{1}{3}$. • When I multiply $2\frac{1}{4}$ by 1, it equals $2\frac{1}{4}$. • Now I have to multiply $2\frac{1}{4}$ by $\frac{1}{3}$. • $\frac{1}{3}$ times 2 is $\frac{2}{3}$. • $\frac{1}{3}$ times $\frac{1}{4}$ is $\frac{1}{12}$. • So the answer is $2\frac{1}{4} + \frac{2}{3} + \frac{1}{12}$ or $2\frac{3}{12} + \frac{8}{12} + \frac{1}{12} = 2\frac{12}{12} = 3$	
7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1] • Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division*	• Find reciprocals • Divide whole numbers by fractions • Divide fraction by fraction • Create visual representation of word problems	In fifth grade, students experience division problems with whole number divisors and unit fraction dividends (fractions with a numerator of 1) or with unit fraction divisors and whole number dividends. Students extend their understanding of the meaning of fractions, how many unit fractions are in a whole, and their understanding of multiplication and division as involving equal groups or shares and the number of objects in each group/share. In sixth grade, they will use this foundational understanding to divide into and by more complex fractions and develop abstract methods of dividing by fractions. Division Example: Knowing the number of groups/shares and finding how many/much in each group/share • Four students sitting at a table were given 1/3 of a pan of brownies to share. How much of a pan will each student get if they share the pan of brownies equally? ○ The diagram shows the 1/3 pan divided into 4 equal shares with each share equaling 1/12 of the pan.	<u>Language Arts:</u> Students create word problems <u>Career and Life Skills:</u> Reducing a recipe

to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3. • Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* • Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*		 Examples: Knowing how many in each group/share and finding how many groups/shares • Angelo has 4 lbs of peanuts. He wants to give each of his friends 1/5 lb. How many friends can receive 1/5 lb of peanuts? A diagram for 4 ÷ 1/5 is shown below. Students explain that since there are five fifths in one whole, there must be 20 fifths in 4 lbs.  • How much rice will each person get if 3 people share 1/2 lb of rice equally? $\frac{1}{2} \div 3 = \frac{3}{6} \div 3 = \frac{1}{6}$ ○ A student may think or draw ½ and cut it into 3 equal groups then determine that each of those part is 1/6. A student may think of ½ as equivalent to 3/6. 3/6 divided by 3 is 1/6.	

Essential Question(s): How can measurement be used to solve problems?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Measurement and Data			
Standards: 5. MD			
A. Convert like measurement units within a given measurement system.			
Vocabulary: convert, metric, customary units, equivalent			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	• Review units of measurement • Compare and order measuring units • Practice conversion of units within a given measurement system ○ Customary units ○ Metric units • Solve multi-step real-world problems involving multiplication, division, addition, subtraction, whole numbers and decimals.	In fifth grade, students build on their prior knowledge of related measurement units to determine equivalent measurements. Prior to making actual conversions, examine the units to be converted, determine if the converted amount will be more or less units than the original unit, and explain reasoning. Use several strategies to convert measurements. When converting metric measurement, students apply their understanding of place value and decimals. Ex. 65 yards into feet 65 yards x $\frac{3 \text{ feet}}{1 \text{ yard}}$ = 195 feet (strategy: use equivalent fractions)	

Math Curriculum
Grade Five

Essential Question(s): How are line plots used to display a data set?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving, Life and Career Skills			
Content: Measurement and Data			
Standards: 5. MD			
B. Represent and Interpret Data			
Vocabulary: line plot, data set,			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	• Represent data in fractions on line plots. • Solve real-world problems involving data on line plots	Ten beakers, measured in liters, are filled with a liquid.  The line plot above shows the amount of liquid in liters in 10 beakers. If the liquid is redistributed equally, how much liquid would each beaker have? (This amount is the mean.) Students apply their understanding of operations with fractions. They use either addition and/or multiplication to determine the total number of liters in the beakers. Then the sum of the liters is shared evenly among the ten beakers.	<u>Social Studies/ Science:</u> Have student create a survey, collect data and create a line plot based on a social studies or science topic

Math Curriculum
Grade Five

Essential Question(s): How is the concept of volume related to arithmetic operations?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Measurement and Data			
Standards: 5. MD			
C. Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.			
Vocabulary: cube, cubic unit, solid figure, volume, exponent, rectangular prism, length, width, height			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. • A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. • A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	• Use manipulatives to build solids • Estimate number of cubic units needed to fill a given space.	Students' prior experiences with volume were restricted to liquid volume. As students develop their understanding volume they understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. This cube has a length of 1 unit, a width of 1 unit and a height of 1 unit and is called a cubic unit. This cubic unit is written with an exponent of 3 (e.g., in^3, m^3). Students connect this notation to their understanding of powers of 10 in our place value system. Models of cubic inches, centimeters, cubic feet, etc. are helpful in developing an image of a cubic unit. Students estimate how many cubic yards would be needed to fill the classroom or how many cubic centimeters would be needed to fill a pencil box.	
4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	• Count cubic units using manipulatives (tissue box) Select appropriate units and strategic for solving volume problems	Students understand that same sized cubic units are used to measure volume. They select appropriate units to measure volume. For example, they make a distinction between which units are more appropriate for measuring the volume of a gym and the volume of a box of books. They can also improvise a cubic unit using any unit as a length (e.g., the length of their pencil). Students can apply these ideas by filling containers with cubic units (wooden cubes) to find the volume. They may also use drawings or interactive computer software to simulate the same filling process.	

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<td>5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

• Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
• Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
• Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.</td>
<td>• Find the volume of a rectangular container by using unit cubes.
• Identify the relationship between the edge lengths and total volume.
• Apply the formula to rectangular prisms.
• Separate a solid figure into two non-overlapping right rectangular prisms. Apply the formula to each to find the volume. Add the volume to determine the total volume of the solid figure.
Use this technique to solve real-world problems.</td>
<td>Students need multiple opportunities to measure volume by filling rectangular prisms with cubes and looking at the relationship between the total volume and the area of the base. They derive the volume formula (volume equals the area of the base times the height) and explore how this idea would apply to other prisms. Students use the associative property of multiplication and decomposition of numbers using factors to investigate rectangular prisms with a given number of cubic units.

Examples:
• When given 24 cubes, students make as many rectangular prisms as possible with a volume of 24 cubic units. Students build the prisms and record possible dimensions.
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<tr><th>Length</th><th>Width</th><th>Height</th></tr>
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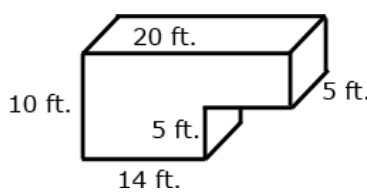
<tr><td>2</td><td>2</td><td>6</td></tr>
<tr><td>4</td><td>2</td><td>3</td></tr>
<tr><td>8</td><td>3</td><td>1</td></tr>
</table>
• Students determine the volume of concrete needed to build the steps in the diagram below.

• A homeowner is building a swimming pool and needs to calculate the volume of water needed to fill the pool. The design of the pool is shown in the illustration below.

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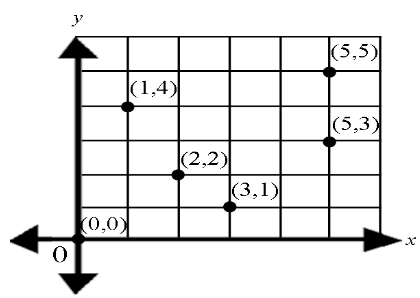
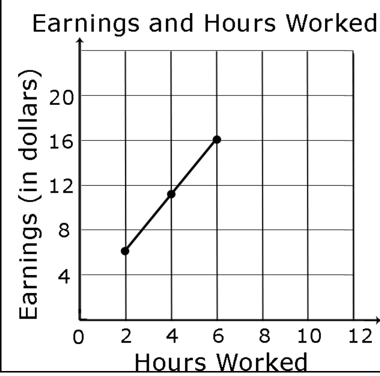
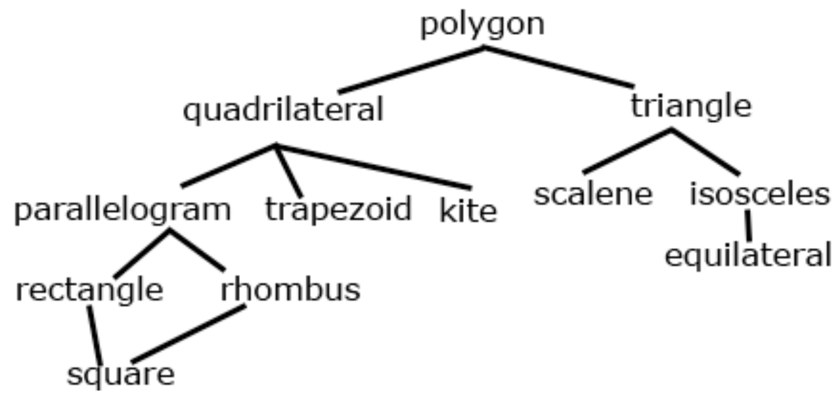
Math Curriculum
Grade Five

Essential Question(s): How is the coordinate plane used to solve real-world and mathematical problems?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Geometry			
Standards: 5.G			
A. Graph points on the coordinate plane to solve real-world and mathematical problems.			
Vocabulary: horizontal, vertical, x-axis, y-axis, origin, plot, ordered pair, coordinate, coordinate plane, quadrant, perpendicular, intercept			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	• Draw and label a coordinate plane • Create the algebraic relationship from input/output chart to a coordinate plane • Plot points in the first quadrant • Explain the first number in the ordered pair is the x-coordinate and the second number in the ordered pair is the y-coordinate	Examples: • Students can use a classroom size coordinate system to physically locate the coordinate point (5, 3) by starting at the origin point (0,0), walking 5 units along the x axis to find the first number in the pair (5), and then walking up 3 units for the second number in the pair (3). The ordered pair names a point in the plane.  • Graph and label the points below in a coordinate system. ○ A (0, 0) ○ B (5, 1) ○ C (0, 6) ○ D (2.5, 6) ○ E (6, 2) ○ F (4, 1) ○ G (3, 0)	<u>Social Studies:</u> Map Grid Read: <u>Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time</u> by Dava Sobel

2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	• Graph points related to word problems and interpret coordinate values	Examples:
		• Sara has saved $20. She earns $8 for each hour she works.
		  ○ If Sara saves all of her money, how much will she have after working 3 hours? 5 hours? 10 hours?
		  ○ Create a graph that shows the relationship between the hours Sara worked and the amount of money she has saved.
		  ○ What other information do you know from analyzing the graph?
		• Use the graph below to determine how much money Jack makes after working exactly 9 hours.
		
			<u>Social Studies:</u>
			Map Skills

Essential Question(s): How are attributes used to classify two-dimensional figures?			
21st Century Theme: Financial, Economic, Business, and Entrepreneurial Literacy			
21st Century Skills: Critical Thinking and Problem Solving			
Content: Geometry			
Standards: 5.G			
B. Classify two dimension figures into categories based on their properties.			
Vocabulary: two-dimensional, rectangle, square, parallel, perpendicular, congruent, symmetry, parallelogram, quadrilaterals, regular polygons, polygons, trapezoid, right triangle, , isosceles triangle, equilateral triangle, scalene triangle, acute triangle, obtuse triangle			
Skills	**Instructional Procedures**	**Explanations and Examples**	**Interdisciplinary Connections**
3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	• Review attributes of two-dimensional figures • Introduce students to subcategories of two-dimensional figures	Geometric properties include properties of sides (parallel, perpendicular, congruent), properties of angles (type, measurement, congruent), and properties of symmetry (point and line). Example: • If the opposite sides on a parallelogram are parallel and congruent, then rectangles are parallelograms. A sample of questions that might be posed to students include: • A parallelogram has 4 sides with both sets of opposite sides parallel. What types of quadrilaterals are parallelograms? • Regular polygons have all of their sides and angles congruent. Name or draw some regular polygons. • All rectangles have 4 right angles. Squares have 4 right angles so they are also rectangles. True or False? • A trapezoid has 2 sides parallel so it must be a parallelogram. True or False?	Science: Find shapes in nature Technology: http://illuminations.nctm.org/ActivityDetail.aspx?ID=70
4. Classify two-dimensional figures in a hierarchy based on properties.	• Identify two-dimensional figures based on properties.	Properties of figure may include: • Properties of sides—parallel, perpendicular, congruent, number of sides • Properties of angles—types of angles, congruent Examples: • A right triangle can be both scalene and isosceles, but not equilateral. • A scalene triangle can be right, acute and obtuse.	

.		Triangles can be classified by:
		• Angles
		  ○ Right: The triangle has one angle that measures 90º.
		  ○ Acute: The triangle has exactly three angles that measure between 0º and 90º.
		  ○ Obtuse: The triangle has exactly one angle that measures greater than 90º and less than 180º.
		• Sides
		  ○ Equilateral: All sides of the triangle are the same length.
		  ○ Isosceles: At least two sides of the triangle are the same length.
		  ○ Scalene: No sides of the triangle are the same length.
			

Course: Grade 5 Mathematics
Curriculum Map – Draft
Textbook: Math in Focus, Marshall Cavendish, 2010

Month	Chapter/Topic	Assessments
September	Chapter 1 – Whole Numbers	Assessment Chap 1
October	Chapter 2 – Whole Numbers Multiplication and Division	Assessment Chap 2
November	Chapter 3-Fractions and Mixed Numbers	Assessment Chap 3
December	Chapter 4 – Multiplying and Dividing Fractions and Mixed	Assessment Chapter 4 Benchmark Chap 1-4

	Numbers Chapter 5 – Algebra	Assessment Chap 5
January	Chapter 6 – Area of a Triangle Chapter 7 -Ratio	Assessment Chap 6 Assessment Chap 7 Mid Year Benchmark Assessment
February	Chapter 8 - Decimals Chapter 9 – Multiplying and Dividing Decimals	Assessment Chap 8
March	Chapter 9 – Multiplying and Dividing Decimals Chapter 10 – Per Cent	Assessment Chap 9 Assessment Chap 10 Benchmark Chap 8-10
April	Chapter 11 – Graphs and Probability Chapter 12 - Angles	Assessment Chap 11 Assessment Chap 12
May	Chapter 13 –Properties of Triangle and Four-Sided Figures Chapter 14 – Three-Dimensional Shapes	Assessment Chap 13 Assessment Chap 14
June	Chapter 15 – Surface Area and Volume	Assessment Chap 15 End of Year Assessment

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