Fifth Grade Curriculum

Mathematics

Francis Howell School District

HOME SCHOOL COMMUNITY

LEARNING TOGETHER

Board Approved:

04/03/2014

Francis Howell School District
Fifth Grade Curriculum – Mathematics

Mission

Francis Howell School District is dedicated to preparing students today for success tomorrow.

Vision

Every student will graduate with college and career readiness skills.

Values

Francis Howell School District is committed to:

- Provide a consistent and comprehensive education that fosters high levels of academic achievement
- Operate a safe learning environment for all students
- Recruit and retain a high-quality staff
- Promote parent, community, student, and business involvement in support of the school district
- Ensure fiscal responsibility
- Develop responsible citizens
- Operate as a professional learning community
- Make appropriate use of technology

Francis Howell School District Graduate Goals

Upon completion of their academic study in the Francis Howell School District, students will be able to:

- gather, analyze and apply information and ideas
- communicate effectively within and beyond the classroom
- recognize and solve problems
- make decisions and act as responsible members of society

Rationale for Elementary Mathematics

Using the Missouri Learning Standards as a base, the Francis Howell K-5 mathematics curriculum emphasizes conceptual understanding, procedural skill and fluency and application of concepts in real-world, problem-solving situations to address rigor as defined in the Missouri Learning Standards. Teachers will emphasize the use of the 8 mathematical practices outlined in the Standards to bring students to a deeper understanding of the focal points for each grade level. These eight mathematical practices, which should be embedded into math daily and are applicable for Grades K-12, are:

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

Course Description for Fifth Grade Math

In Grade 5, instructional time should 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 (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (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.

1) Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)
2) Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.
3) Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

Elementary Math Curriculum Contributors (positions 2013-2014)

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Scope and Sequence for Fifth Grade Mathematics 2017-2018

Qtr 1: 42 days Qtr 2: 42 days Qtr 3: 42 days Qtr 4: 43 days

Qtr	Lessons	Maximum Days	Topic/Description	Domain
1	6	9 days	Topic 1: Place Value	Numbers and Operations in Base
1	7	11 days	Topic 2: Adding and Subtracting Decimals	
1	6	10 days	Topic 3: Multiplying Whole Numbers	
1	7	11 days	Topic 4: Dividing by 1-Digit Divisors	
2	8	12 days	Topic 5: Dividing by 2-Digit Divisors	
2	7	11 days	Topic 6: Multiplying Decimals	
2	7	11 days	Topic 7: Dividing Decimals	
2	5 (+2 for MO-specific standards)	9 days	**Topic 16: Coordinate Geometry**	Geometry
3	7	11 days	Topic 8: Numerical Patterns, Expressions, and Relationships	Operations and Algebraic Thinking
3	7	12 days	Topic 9: Adding and Subtracting Fractions	Numbers and Operations - Fractions
3	6	9 days	Topic 10: Adding and Subtracting Mixed Numbers	
3-4	12	15 days	Topic 11: Multiplying and Dividing Fractions and Mixed Numbers	
4	4	7 days	Topic 12: Volume of Solids	Measurement and Data
4	7	11 days	Topic 13: Units of Measure	
4	5 (+2 for MO-specific standards)	9 days	Topic 14: Data	
4	5 (combine 16-3&4; skip 16-5)	7 days	Topic 15: Classifying Plane Figures	Geometry
	107	**165 days**		
If time	10	10 days	Step-Up: Step-Up to Grade 6 Lessons	combination

To ensure all grade level standards are met, all topics must be completed. While teachers and PLCs should take into account student progress and make decisions based on their individual classes, the expectation is that all students will be taught all material in the standards/topics. If teams/teachers are struggling with pacing, they should work with their administration and content leader to develop a plan to ensure students are taught all content in their grade level.

Content Area: Math	**Course: Grade 5**	**UNIT: Operations and Algebraic Thinking**
Unit Description: The Order of Operations is a convention which standardizes the way expressions are evaluated and simplified in mathematical fields such as engineering and computer science. Operational precedence also works to make computation more accurate should errors be introduced into expressions. The order of operations states that what is inside parentheses should be computed first, terms with exponents should be evaluated next, then multiplication and division from left to right. Finally, addition and subtraction from left to right should be computed. Although it is not foolproof, the order of operations specifies that operations with greater effects on the result (e.g., multiplication and division) be applied first, so that errors in expressions are not multiplied over and over.		**Unit Timeline:** Approx. 10 days

DESIRED RESULTS
Transfer Goals - ***Students will be able to independently*** ● Use multiplication to find, continue, and develop number patterns. ● Translate word phrases into algebraic expressions. ● Evaluate an expression containing more than one operation (whole numbers and decimals). ● Model mathematical patterns shown in tables, write rules for the patterns, and look for relationships between two sequences. ● 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.

Understandings - ***Students will understand that…***

1. Some mathematical phrases can be represented using a variable in an algebraic expression.
2. There is an agreed upon order for which operations in a numerical expression are performed.

3. To simplify a numerical expression, first compute within parentheses. Second, evaluate all terms with exponents. Then do any multiplication and division calculations from left to right followed by any addition and subtraction calculations from left to right.
4. Patterns can sometimes be used to identify a relationship between two quantities. Some rea- world quantities have a mathematical relationship; the value of one quantity can be found if you know the value of the other quantity.
5. Patterns that repeat in predictable ways may be used to identify relationships.
6. Some problems can be solved by using objects to act out the actions in a problem. Some problems can be solved by reasoning about the conditions of the problem.

Essential Questions: ***Students will keep considering…***

- How are the values of an algebraic expression and a numerical expression found?
- How can you translate words in to expressions?
- How can you evaluate a numerical expression containing more than one operation?
- How can you use the order of operations to evaluate expressions with decimals?
- How can you find a rule and write an addition and subtraction expression?
- How can you find a rule and write an multiplication and division expression?
- How can you find the relationship between two sequences?
- How can you act out a problem and use reasoning to solve it?

Students Will Know…	Students Will Be Able to …	Standard
● **variable**- a letter, such a n, that stands for a number in an expression or equation. ● **numeric expression**- a combination of numbers and one or more operation symbols. ● **algebraic expression**- a mathematical phrase involving a variable or variables, numbers and operations. ● **corresponding**- matching terms in a pattern. ● **sequence**-a set of numbers that follows a pattern, or variables such as x or y in an algebraic expression ● **order of operations**- the order in which operations are done in calculations. Operations inside parentheses are done first. Second, evaluate all terms with exponents. Then do any multiplication and division calculations from left to right followed by any addition and subtraction calculations from left to right.	*1.* Use parentheses, brackets, or braces in numerical expressions, to illustrate real-life situations, and evaluate expressions with these symbols. *Example: Fred planned to spend $8 on a new ap and bought several MP3 files for $3 each. He then decided to get the same for his sister and spend another $10 for their lunch. Write the expression that explains his thought process: 2(8 + 3m) + 10* 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. 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.	5.OA.1 5.OA.2 5.OA.3

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5.OA.2
5.OA.3</td><td>Summative: Topic 8 Performance Task: REQUIRED FOR DATA ENTRY
Scoring Guide: See district protocol posted on MC, Schoology, or HowellNET</td><td>C</td></tr>
<tr><td>1, 2, 3</td><td>5.OA.1</td><td>Formative #1: Evaluate the expression below step by step, identifying the operations that you perform and the order in which you perform them.
18 + 5 + (5-3) x 6 ÷ 3 – 2 =
○ Scoring Guide: see student samples on page 185A of Realize TE</td><td>B</td></tr>
<tr><td>1, 2, 3, 4</td><td>5.OA.3</td><td>Formative #2: (Topic 8, Quick Check Master 8-5)
The Ramirez family’s favorite snack is yogurt. Mrs. Ramirez buys yogurt in different sized cases.
<table><tr><td>Number of containers in a case</td><td>10</td><td>20</td><td>35</td></tr><tr><td>How many days pass before it is all eaten.</td><td>2</td><td>4</td><td>7</td></tr></table>How many days would it take for a case of 25 yogurts to be eaten? Explain your reasoning.
○ Scoring Guide: see Assessment on page 191A of Realize TE</td><td>B</td></tr>
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SAMPLE LEARNING PLAN				
Pre-assessment: Use "Review What you Know" to diagnose students' readiness by assessing prerequisite content.				
Understanding	**Standards**	**Major Learning Activities:**	**Instructional Strategy:**	**R/R Quadrant**
1, 2	5.OA.2	Translate word phrases into **algebraic expressions** 1. Set the purpose by telling students that they have learned how to translate a word phrase into a *numerical* expression. Today they will be learning how to translate a word phrase into an *algebraic* expression. Show intro problem on Pearson Realize 2. Connect by asking students to describe 4 + 3 using different word phrases (4 plus 3, sum of 4 and 3, 3 more than 4…] 3. Pose the problem: Write the following numbers and symbols on the board: ☐ + △ 5 x . Tell the students that the square and triangle are each covering one number. Ask "Without knowing what the numbers are, what are different word phrases you could use to describe each?" Have students discuss their ideas with a partner and record the ideas in writing. Discuss alternate word phrases. [Possible answers: the sum of 5 and a number, 5 more than a number; 4 times a number, the product of a number and 4].	Cooperative Learning	A
4, 7	5.OA.2	1. Model how to break apart the expression step by step. "What is the first piece of information you are given? [That the number 5 will be in the expression]. Write 5 on the board. "What information are you given next?" [It will be an addition problem.] "Where will the plus sign go?" [To the right of the number 5.] "What is the final piece of information that you are given in the word phrase?" [That a number is added to 5.] "Are you told what number is added? [No.] " How can you represent this unknown number?" [By using a variable, such as *n* for the number.] "Where should the variable go?" [To the right of the plus sign.] Write the variable on the board. "What kind of expression is this?" [An algebraic expression.] Ask students to read the expression aloud. Students should notice that the expression they read is similar to, if not the same as, the word phrases that they translated. Repeat with 4 x △ . 2. Provide pairs (teams) a set of cards with which they will play a game of memory. They will start with the cards face down and arranged in 4 rows of	Homework and Practice	B

		5 cards. Students take turns turning over two cards. The student explains why the cards match (phrases are the same as the expression) or why they don't ("This expression has a plus sign, but the phrase means division.") Remaining students will confirm the explanations—discussions should include corrections of thinking ["twice as much" doesn't mean division, it indicates multiplication"]. If the remaining students agree that there is a match, the student takes the set, and continues to play until no match is made. Play continues until all cards have been claimed. 3. As students work on pages 180 and 181, assist or work with small groups as necessary.		

UNIT RESOURCES
Teacher Resources: ● **Realize Teacher Manual** ● **Pearson Envision: Realize Website** ● **Manipulative kit**
Student Resources: ● Envision: Realize Student Book
Vocabulary: ● **variable**- a letter, such a n, that stands for a number in an expression or equation. ● **numeric expression**- a combination of numbers and one or more operation symbols. ● **algebraic expression**- a mathematical phrase involving a variable or variables, numbers and operations.

Content Area: Math	**Course: Grade 5**	**UNIT: Number & Operations in Base Ten**
Unit Description: The base ten numeration system is a scheme for recording numbers using digits 0-9, groups of ten, and place value. Numbers can be used for different purposes, and numbers can be classified and represented in different ways. Students learn to apply their understanding of models for division, place value, properties, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. Students select appropriate methods and apply them accurately to estimate quotients or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including the standard algorithm, for dividing whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems. Students also consider the context in which a problem is situated to select the most useful form of the quotient for the solution, and they interpret it appropriately.		**Unit Timeline:** 50-55 days

DESIRED RESULTS
<u>Transfer Goals-</u> ***Students will be able to independently use their learning to…***
● Compare decimals, write them in expanded and word forms, and use decimal relationships to complete patterns
● Use estimation strategies when adding and subtracting decimals
● Multiply 2-digit by 2-digit numbers
● Use repeated reasoning to divide by 1-digit divisors
● Use information in a table to write division equations and solve them
● Multiply a whole number by a decimal when calculating with money amounts
● Use estimation strategies to check that answers are reasonable
● 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.

Understandings - ***Students will understand that…***

1. Our number system is based on groups of ten. In a multi-digit number, a digit in one place represents ten times what it would represent in the place immediately to its right and one tenth what it would represent in the place immediately to its left.
2. Place value can be used to compare and order whole numbers and decimals.
3. Some problems can be solved by identifying elements that repeat in a predictable way.
4. There is more than one way to do a mental calculation. Models and algorithms for adding or subtracting multi-digit decimals are just an extension of models and algorithms for adding or subtracting multi-digit whole numbers.
5. A number line can be used to round whole numbers and decimals by making it easy to see which multiple of 10, 100, etc., or of 0.1, 0.01, etc., a number is closest to.
6. There is more than one way to estimate a sum, difference, product, or quotient.
7. Some sequences of numbers or objects repeat or grow in predictable ways.
8. Some problems can be solved by first finding and solving a sub-problem(s) and then using that answer(s) to solve the original problem.
9. Information in a problem can often be shown using a diagram and used to solve the problem.
10. The sharing interpretation of division and money can be used to model the standard division algorithm.
11. Some problems have data missing that is needed to find the answer, and some problems have extra data not needed to solve the problem.
12. Rounding and compatible numbers can be used to estimate the product of a whole number and a decimal.
13. The standard multiplication algorithm involving decimals is an extension of the standard algorithm for multiplying whole numbers.
14. The standard division algorithm involving decimals is an extension of the standard algorithm for dividing whole numbers.
15. A number divided by a decimal can be represented as an equivalent calculation using place value to change the divisor to a whole number.
16. The properties of multiplication can be used to simplify computation and to verify mental math and paper and pencil algorithms.
17. Patterns can be used to mentally multiply decimals by 10, 100 and 1000, and explain why counting zeroes can produce inaccurate results.
18. The location of decimal points in decimal division calculations can sometimes be decided by reasoning about the relative size of the given numbers.

Essential Questions: ***Students will keep considering…***

- How do the digits in a multi-digit number relate to each other?
- How can you write a fraction as a decimal?
- How can you use information organized on a grid to help find a pattern?
- How can you use sums and differences of decimals?
- How can you round and estimate sums and differences of decimals?
- How can you use a grid to add and subtract decimals?
- How can you add and subtract decimals?
- How can you solve problems that require more than one step?
- What are the properties of multiplication?
- How can you use patterns and mental math to multiply by multiples of 10, 100, or 1,000?
- How can you find the product of a 2-digit number and a multiple of ten?
- How can you multiply 3-digit numbers by 2-digit numbers?
- How can you use mental math to divide multiples of 10 and 100?
- How can you use compatible numbers to estimate quotients and then decide if your quotient is reasonable?
- When do you write a zero in the quotient?
- How can patterns help you divide large multiples of 10?
- How can you use arrays to model multi-digit division?
- How do you divide by a multiple of ten?
- How can you solve problems involving division of larger numbers?
- What is the rule for multiplying decimals by 10, 100, or 1000?
- How can number sense be used to determine the location of decimal points in decimal multiplication calculations?
- How can you multiply and divide a decimal by a whole number?
- How can you use reasoning to correctly place the decimal point in the quotient?

Students Will Know…	Students Will Be Able to …	Standard
Vocabulary ● Value: the place of a digit in a number ● Equivalent decimals: numbers that name the same amount ● Standard form: writing a number using its digits ● Expanded form: taking apart a number and writing each digit for what it's worth ● Word form: writing out a number using words ● Compensation: adjust one or both numbers to make the computation easier ● Commutative Property: change the order of numbers ● Associative Property: change the grouping of numbers ● Compatible numbers: numbers that are easy to compute mentally ● Rounding: replaces one number with another number that tells about how much or how many ● Factors: numbers that are multiplied to get a product ● Multiple: product of a given whole number and another whole number ● Base: number to be multiplied ● Exponent: the number that tells how many times the base is used as a factor ● Dividend: the number you are dividing ● Divisor: the number you are dividing by ● Quotient: the answer to a division problem	**Understand the place value system.** 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 2. Explain patterns in the number of zeroes 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. *For example, explain why 3.8 x 100 is not equivalent to 3800 and 380 x 100 is not equivalent to 3800.* 3. Read, write, and compare decimals to thousandths a. 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). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4. Use place value understanding to round decimals to any place. **Perform operations with multi-digit whole numbers and with decimals to hundredths.** 5. Fluently multiply multi-digit whole numbers using the standard algorithm without losing place value understanding of why the algorithms work (from 4th grade). 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. Students will explain their understanding using mathematically precise language instead of "put the number here, line up, put a zero there and bring down.	5.NBT.1 5.NBT.2 5.NBT.3 5.NBT.4 5.NBT.5 5.NBT.6

	7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used	5.NBT.7

EVIDENCE of LEARNING			
Understanding	Standards	**Unit Performance Assessment**:	**R/R Quadrant**
1, 2, 3, 7	5.NBT.3	**Summative: Topic 4 Performance Task: REQUIRED FOR DATA ENTRY** **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C
6	5.NBT.4	● **Formative:** Topic 1 Performance Task **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	A
1, 4, 8	5.NBT.5	● **Formative:** Topic 2 Performance Task **Scoring Guide**: See district protocol posted on MC, Schoology, or HowellNET	C
9, 10	5.NBT.6	● **Formative:** Topic 3 Performance Task **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	A
1, 9, 12	5.NBT.6	● **Formative:** Topic 5 Performance Task **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	A
6, 12, 16, 17	5.NBT.7	● **Formative:** Topic 6 Performance Task **Scoring Guide:** see 3-point scoring rubric on p. 154 of Envisions TE	C
11, 12, 14, 15	5.NBT.4	● **Formative:** Topic 7 Performance Task **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	B

SAMPLE LEARNING PLAN				
Pre-assessment: Use "Review What you Know" to diagnose students' readiness by assessing prerequisite content.				
Understanding	**Standards**	**Major Learning Activities:**	**Instructional Strategy:**	**R/R Quadrant**
1, 3	5.NBT.1	Students represent decimals in a place-value chart 1. Set the purpose by telling students that they have learned about decimal place value through hundredths. Today we will learn about thousandths. Show intro problem on Pearson Realize 2. Connect by showing a tomato seed to the class. Say, "How much do you think this seed weighs? How could you find out how much a seed weighs?" 3. Pose the problem: Distribute Teaching tool 6. Write 9.85 seconds on the board. Say, "A runner won the men's 100-meters race in the 2004 Olympics with a time of 9.85 seconds. How can you use place-value to explain this time?" 4. Model how to draw a place-value chart on the board for hundreds, tens, ones, tenths, hundredths, and thousandths. Ask, "How can you write 9.85 on this chart? How can you write this in words?" 5. Have students work in groups. Write 0.090 on the board. Say "show how to write this number on your chart and tell how you would read it."	Cooperative Learning	A
6	5.NBT.4	Students round to estimate sums and differences 1. Set the purpose by telling students they already know how to round numbers. Today we will learn how to use rounded numbers to estimate sums and differences. 2. Connect by having them think of a situation when you might estimate a sum or a difference. 3. Pose the problem: Say, "Suppose an amusement park has two roller coasters. One is 610 feet long and the other is 485 feet long. About how many feet long are these rides in all? About how many feet longer is one than the other? Estimate the answer to each question. Be ready to tell how you found your estimates." 4. Link to prior knowledge by drawing a number line on the board and label it from 0 to 1,000 in increments of 100. Write the numbers 160,	Cooperative Learning	A

		887, and 308 on the board. Say, "You know how to use a number line to round numbers such as these." Mark the numbers on the number line, and have students round each number to the nearest hundred. 5. Extend this by writing 610 and 485 on the board. "Round these two numbers, using the number line. How could you figure out if the sum of these numbers is less than or greater than 1,000 without actually adding them? What is the sum of the rounded numbers?"		
13	5.NBT.5	Students use area models on graph paper to multiply 2-digit by 2-digit numbers. 1. Set the purpose by telling students they already know how to multiply a 2-digit by 1-digit number. Today they will learn how to multiply a 2-digit by 2-digit number. Show intro problem on Pearson Realize 2. Connect by asking students how they can use a drawing to help them multiply. 3. Pose the problem: "Suppose a carpenter sells 38 chairs in one day. Each chair costs $23. How much money does the carpenter make? Use what you know about the meaning of multiplication to solve this problem any way you choose." 4. Model using drawing. Have them use grid paper to draw a 23 by 38 rectangle. Ask, "how can I draw lines to show that 23 is 20 + 3 and 38 is 30 + 8?" 5. Instruct in small steps, modeling on the board what they just did using partial products. Write the problem 23 x 38 vertically and find the sum of each row, one at a time. 6. In small groups have them multiply 37 x 26 using an area model and using it to follow the steps they just did in #5 above.	Cooperative Learning	A
12	5.NBT.6	Students use a multiplication table and compatible numbers to estimate quotients. 1. Set the purpose by telling students that today they will be learning how to estimate quotients. 2. Connect by making up a problem where you need to use division, but they don't need to have an exact answer; an estimate is all that is needed.	Cooperative Learning	A

		3. Pose the problem: Say, "Suppose you have 134 stamps in your collection. You want to display them on 5 pages of an album with about the same number of stamps on each page. About how many stamps should go on each page?" 4. Use a multiplication table, if needed, to help students find the exact number of stamps on each page. Then find compatible numbers to use in order to estimate. 5. Model on the board finding compatible numbers using the numbers 10 and 15. Teach them to add a zero to the end of each number to help. 6. In small groups, have students estimate 465 divided by 7 and 346 divided by 4. Use a multiplication chart if necessary.		
10	5.NTB.6	Students divide 3-digit numbers by 2-digit numbers with and without remainders. 1. Set the purpose by telling students they already know how to divide by two-digit multiples of ten and today they will learn to divide by any two-digit number. Show intro problem on Pearson Realize 2. Connect by asking students a time when they might divide. 3. Pose the problem: Say, "Suppose you need 250 yards of string to fly kites at a festival. String comes in balls of 75 yards. How many balls of string do you need to buy? Solve any way you choose." 4. Link to their prior knowledge by asking them how to estimate 250 divided by 75. 5. Instruct students in small steps, by saying "Since you want to find out how many 75s are in 250, you can divide. You can use your estimate to divide. About how many 75s are in 250? Three 75s are in 225. Subtracting gives 25. 250 divided by 75 is 3 with a remainder of 25. So, how many ball of string are needed?"	Cooperative Learning	A
13	5.NBT.7	Students model multiplying a whole number by a decimal using hundredths grids. 1. Set the purpose by telling students they already know how to add and subtract decimals and whole numbers. Today they will learn how to multiply decimals and whole numbers.	Cooperative Learning	A

		2. Connect by telling students that decimals and whole numbers are often multiplied in everyday life. For example, if you knew that 1 can of peas costs .79 cents, how could you find the cost of 4 cans? 3. Pose the problem: Say, "John is attaching 3 planks of wood together end-to-end to begin making a fence. Each plank is 0.45 meters long. How could you find the total length of the wood? Use the decimal models in Item 1 on the Teach Tool to help you find the answer." 4. Model: Have students use the hundredths grids to model the problem 3 x 0.45. Make sure they understand to shade in 0.45 of the grid three times and then find the total amount that is shaded. 5. Have them work in small groups to find the product of 0.7 x 4.		
18	5.NBT.1 5.NBT.6	Students use number sense to locate the decimal points in dividends, divisors, and quotients. 4. Set the purpose by telling students today they will use number sense and estimation to determine where to place the decimal point when dividing with decimals. Show intro problem on Pearson Realize 1. Connect by asking students when dividing, if the divisor is greater than the dividend, what do you know about the quotient? If the divisor is less than 1, what do you know about the quotient? 2. Pose the problem: Have students copy the 6 problems from Set A and Set B on their paper. For Set A, the correct digits in the quotient are given, but the quotient may be rounded. Think about the size of the divisor to decide where the decimal point should be in the quotient. For Set B, use number sense to write a decimal that makes each statement correct. There is more than one possible answer for each exercise. 3. Discuss as a whole class how they used number sense to solve the exercises in Set A. What decimals are possible for Set B? Is there more than one possible decimal for each?	Cooperative Learning	D

UNIT RESOURCES
Teacher Resources: ● **Envisions Teacher Manual** ● **Pearson Realize Online** ● **Manipulative kit**
Student Resources: ● Envisions Student Book
Vocabulary: ● Value: the place of a digit in a number ● Equivalent decimals: numbers that name the same amount ● Standard form: writing a number using its digits ● Expanded form: taking apart a number and writing each digit for what it's worth ● Word form: writing out a number using words ● Compensation: adjust one or both numbers to make the computation easier ● Commutative Property: change the order of numbers ● Associative Property: change the grouping of numbers ● Compatible numbers: numbers that are easy to compute mentally ● Rounding: replaces one number with another number that tells about how much or how many ● Factors: numbers that are multiplied to get a product ● Multiple: product of a given whole number and another whole number ● Base: number to be multiplied ● Exponent: the number that tells how many times the base is used as a factor ● Dividend: the number you are dividing ● Divisor: the number you are dividing by ● Quotient: the answer to a division problem

Content Area: Math	**Course: Grade 5**	**UNIT: Numbers and Operations - Fractions**
Unit Description: A set of real numbers is infinite and ordered (number line). Numerical calculations can be approximated by replacing numbers with other numbers (estimation). There are multiple interpretations of addition, subtraction, multiplication, and division or rational numbers, and each operation is related to other operations. Mathematics contents and practices can be applied to solve problems. Any number, measure, numerical expression, algebraic expression, or equation can be represented in an infinite number of ways that have the same value. There is more than one algorithm for each of the operations with rational numbers. Some strategies for basic facts and most algorithms for operations with rational numbers, both mental math and paper pencil, use equivalence to transform calculations into simpler ones. Developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions).		**Unit Timeline:** 25-30 days

DESIRED RESULTS
<u>Transfer Goals</u>- *Students will be able to independently use their learning to…*
● Explain why estimating to the nearest half can be useful. ● Create combinations of fractions or mixed numbers that equal a pre-determined quantity. ● Compare and contrast subtracting mixed numbers with subtracting decimals. ● Explain how to find the area using fractions. ● Write a word problem that can be solved by dividing two fractions and include the answer. ● 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.

Understandings: ***Students will understand that…***

1. A number line can be used to determine the nearest half or whole a fraction is closest to.
2. Fractions with unlike denominators can be added or subtracted by replacing fractions with equivalent fractions with like denominators.
3. The product of the denominators of 2 fractions is a common denominator of both. We can change the way a fraction looks without changing its value by multiplying it by 1. For example: 3/7 x 5/5 = 15/35, and 15/35 = 3/7.
4. Mathematical explanations can be given using words, pictures, numbers, or symbols. A good explanation should be correct, simple, complete, and easy to understanding.
5. There is more than one way to add or subtract mixed numbers. Models can be used to show different ways of adding and subtracting mixed numbers. One way to add or subtract mixed numbers is to utilize a number line to model and find common denominators. Sometimes whole numbers or fractions need to be renamed.
6. Sums and differences of mixed numbers can be estimated by rounding each mixed number to the nearest whole number.
7. A fraction describes the division of a whole into equal parts, and it can be interpreted in more than one way depending on the whole to be divided.
8. The product of a whole number and a fraction can be interpreted in different ways. One interpretation is repeated addition. Multiplying a whole number by a fraction involves division as well as multiplication. The product is a fraction of the whole number. A unit square can be used to show the area meaning of fraction multiplication. When you multiply two fractions that are both less than 1, the product is smaller than either fraction. To multiply fractions, write the product of the numerators over the product of the denominators.
9. The inverse relationship between multiplication and division can be used to divide with fractions.
10. The relative size of the factors can be used to determine the relative size of the product.
11. Rounding and compatible numbers can be used to estimate the product of fractions or mixed numbers.
12. Some problems can be solved by first finding and solving a smaller problem(s) and then using that answer(s) to solve the original problem.

Essential Questions: ***Students will keep considering…***

- What does it mean to add and subtract fractions with unlike denominators?
- What is a standard procedure for adding and subtraction fractions with unlike denominators?
- Why is it useful to estimate sums and differences?
- What is a standard procedure for adding and subtracting mixed numbers?
- What are some of the models you can use to represent fractions or mixed numbers?
- How can a bar diagram help you write an equation to solve a problem?
- What are the standard procedures for estimating and finding products and quotients of fractions and mixed numbers?
- What does a fraction represent? What makes up a fraction?
- How do you know when to multiply with mixed numbers?
- How do write the quotient of 8 divided by 5 so that it shows the remainder?
- When could you draw a picture to solve a problem?

Students Will Know…	Students Will Be Able to …	Standard
● Benchmark fraction: common fraction used for estimating, such as ¼, 1/3, ½, 2/3, and 3/4 ● Mixed number: a number that has a whole-number part and a fractional part ● Resizing: changing the size of a figure while maintaining the shape of the figure and the measures of its angles ● Scaling: multiplying by a number such that the relation of quantities is maintained ● Reciprocal: a given number is a reciprocal of another number if the product of the numbers is one ● Least common denominator: the least common multiple of the denominators of two or more fractions ● Complex fraction: a fraction A/B where A and/or B are fractions (B nonzero) ● Visual fraction model: A tape diagram, number line diagram, or area model.	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.) Students can explain why, In general, a/b + c/d = (ad + bc)/bd.) Students can explain why it is sometimes more efficient to use properties of addition to add and subtract whole numbers separately from the fractional numbers of mixed fractions. Example: 2 1/3 + 4 1/6 = 2 + 4 + 2/6 + 1/6.	5.NF.1
	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.	5.NF.2
	3. Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ 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 whole items 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?	5.NF.3
	4. Interpret the product (a/b) × q as 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.) while maintaining the understanding that multiplying a fraction by a whole number does not require "putting a 1 under it."	5.NF.4a

	5. 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.	5.NF.4b
	6. Interpret multiplication as scaling (resizing), by: comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	5.NF.5a
	7. Interpret multiplication as scaling (resizing), by: 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.	5.NF.5b
	8. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	5.NF.6
	9. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.	5.NF.7a
	10. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.	5.NF.7b
	11. 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?	5.NF.7c

EVIDENCE of LEARNING			
Understanding	Standards	**Unit Performance Assessment**:	**R/R Quadrant**
8, 12	5.NF.5b	**Summative: Topic 11 Performance Assessment- *REQUIRED FOR DATA ENTRY*** **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C
2	5NF.2	**Formative #1:** Topic 9 Performance Assessment-For this assessment, students should use the information in the problems to determine the operations that are necessary to solve and compute with fractions that have unlike denominators. **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	A
5, 6	5.NF.1	**Formative #2:** Topic 10 Performance Assessments - Students use the information in the problem to determine the operation that is necessary to solve and compute with mixed numbers. **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C

SAMPLE LEARNING PLAN				
Pre-assessment: Use "Review What you Know" to diagnose students' readiness by assessing prerequisite content.				
Understanding	**Standards**	**Major Learning Activities:**	**Instructional Strategy:**	**R/R Quadrant**
1, 4	5.NF.2	**Students use a number line to estimate the sum or difference of two fractions.** 1. Set the purpose by telling students that they have added and subtracted fractions with unlike denominators. Today we will learn how to use a number line to estimate fractions sums and differences. Show intro problem on Pearson Realize 2. Connect by asking students why it is useful to estimate sums and differences 3. Pose the problem: Jack needs about 1 ½ yards of string. He can choose only 2 pieces from the following: 2/5 yard, 1/6 yard, and 7/8 of a yard. Without finding the exact amount, which two pieces should he choose to get closest to 1 ½ yards of string? Choose a model. Justify your solution using words, drawings, and numbers. 4. Model using fraction strips. Explain that one way to estimate addition of fractions is to replace each fraction with the nearest half or whole number. Ask them: How can fraction strips help you estimate each fraction. Can you estimate each fraction the same way using a number line? Why? 5. Have students work in groups. Discuss these questions: Which fraction or fractions are closest to 0? Which fraction or fractions are closest to ½? Which is closest to 1? Which lengths should Jack choose? 6. As students work on pages 206 and 207, assist or work with small groups as necessary.	Cooperative Learning	A
2	5.NF.1	**Students formulate a method for subtracting fractions with unlike denominators.** 1. Set the purpose by explaining they have added fractions with unlike denominators and today we will learn how to subtract fractions with unlike denominators. Show intro problem on Pearson Realize 2. Connect to the real world by asking: When in everyday life might you want to subtract fractions with different denominators? 3. Pose the problem: Rose bought 4/6 yard of copper pipe. She used ½ yard to repair the shower. How much pipe does she have left? Work with a partner to solve.	Cues and questions Practice	A

		4. Model by connecting to prior knowledge: How can you add two fractions with unlike denominators, such as 4/6 plus ½? Model solving the problem. 5. In groups discuss: How do you think we will subtract fractions with unlike denominators? 6. As students work on pages 210 and 211, assist or work with small groups as necessary.		
5, 6	5.NF.1; 5.NF.2	**Students model adding mixed numbers using drawings or fraction strips.** 1. Set the purpose by telling them they have learned how to model adding fractions and today you will learn how to model adding mixed numbers. 2. Connect to the real world by discussing some of the models you have used to represent fractions or mixed numbers like fraction strips. 3. Pose the problem: Tory is cutting bread loaves into fourths. She needs to wrap up 3 ¾ loaves to take to a potluck supper and 1 2/4 loaves for a bake sale. How many loaves does Tory need to wrap in all for the potluck supper and the bake sale? 4. Model: Which strips do you need to model the problem? Show the ones and the fourths. What should you model first? What do you know about adding like terms that can help you solve the problem? Why should you simplify the answer? 5. As students work on pages 232, 233, and 234, assist or work with small groups as necessary.	Non-linguistic representations Practice	B
5, 6	5.NF.1	**Students practice adding and subtracting mixed numbers to solve a problem.** 1. Set the purpose by explaining they have learned several different strategies that are useful for adding and subtracting mixed numbers. Today you will use these skills to solve problems. Show intro problem on Pearson Realize 2. Connect to prior knowledge by asking: What kinds of real-world problems they have already solved by adding or subtracting mixed numbers? 3. Pose the problem: Tim has 15 feet of wrapping paper. He uses 4 1/3 feet for his daughter's present and 5 3/8 feet for his niece's present. How much wrapping paper does Tim have left? Be ready to explain each step in your solution. 4. Group discussion - How much wrapping paper does Tim have? About how much of the wrapping paper did he use? About how much wrapping paper does Tim have left?	Generating and testing hypotheses	A

		5. In small groups have them solve the problem of how much wrapping paper Tim used in all. 6. As students work on pages 240 and 241, assist or work with small groups as necessary.		
11	5.NF.5a	**Students will be able to estimate the products of fractions and mixed numbers.** 1. Set the purpose by telling the students they have learned to estimate the products of fractions and mixed numbers. 2. Connect with the real world by asking them to describe a situation in which you would need to estimate a fraction of a whole number. 3. Pose the problem: Raul is training for a 15-mile bike race. He started riding a few miles each day. Now he is riding ¾ of the length of the race each day. About how many miles is Raul riding each day? 4. Group discussion-What product do you need to estimate to solve this problem? What are compatible numbers? Use compatible numbers to find the whole number that is compatible with the denominator of the fraction. 5. Model on the board. What is the denominator of ¾? What is the closest whole number to 15 that is divisible by 4? What is ¼ of 16? How do you know? About how many miles is Raul riding each day? You can also estimate ¾ X 15 by using a fraction compatible with the whole number. 6. Group work-Work with your partner to estimate 2/5 by 18 using compatible numbers you use. 7. As students work on pages 258 and 259 assist or work with small groups as necessary.	Generating and testing hypotheses Practice	A

UNIT RESOURCES
Teacher Resources: ● **Envisions Teacher Manual** ● **Pearson realize** ● **Manipulative kit**
Student Resources: ● Envisions Student Book
Vocabulary: ● Benchmark fraction: common fraction used for estimating, such as 1/4, 1/3, 1/2, 2/3, and 3/4 ● Mixed number: a number that has a whole-number part and a fractional part ● Resizing: changing the size of a figure while maintaining the shape of the figure and the measures of its angles ● Scaling: multiplying by a number such that the relation of quantities is maintained ● Reciprocal: a given number is a reciprocal of another number if the product of the numbers is one ● Least common denominator: the least common multiple of the denominators of two or more fractions ● Complex fraction: a fraction A/B where A and/or B are fractions (B nonzero) ● Visual fraction model: A tape diagram, number line diagram, or area model.

Content Area: Math	**Course: Grade 5**	**UNIT: Measurements & Data**
Unit Description: *Geometric Figures*: Two- and three-dimensional objects with or without curved surfaces can be described, classified, and analyzed by their attributes. An object's location in space can be described quantitatively. *Measurement*: Some attributes of objects are measurable and can be quantified using unit amounts. *Data Collection and Representation*: Some questions can be answered by collecting and analyzing data, and the question to be answered determines the data that needs to be collected and how best to collect it. Data can be represented visually using tables, charts, and graphs. The type of data determines the best choice of visual representation.		**Unit Timeline:** 16-22 days

DESIRED RESULTS

Transfer Goals- ***Students will be able to independently use their learning to…***

- Find the volumes of rectangular prisms.
- Find the volume of a new shape made from the two rectangular prisms.
- Convert customary and metric units of length, capacity, and weight or mass.
- Make a line plot and analyze data.
- 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.

Understandings ***Students will understand that…***

1. Volume is a measure of the amount of space inside a solid figure. Volume can be measured by counting the number of cubic units needed to fill a three-dimensional object.
2. The volume of some objects can be found by breaking apart the object into other objects for which the volume of each can be found.
3. Some problems can be solved by using objects to act out the action in the problem. Some problems can be solved by reasoning about conditions in the problem.

4. Relationships between measurement units of the same length can expressed as an equation. Relationships exist that enable you to convert between units of length by multiplying or dividing.
5. Relationships between measurement units of the same capacity can be expressed as a ratio.
6. Relationships between measurement units of weight/mass can be expressed as a ratio.
7. Some problems can be solved by first finding and solving a sub-problem(s) and then using that answer(s) to solve the original problem.
8. Each type of graph is most appropriate for certain kinds of data. A line plot organizes data on a number line and is useful for showing visually how a set of data is distributed.
9. Some questions can be answered using a survey. An appropriately selected sample can be used to make predictions about a population. Sample size is one factor that determines how close data from the sample will mirror the population.
10. Mathematical explanations can be given using words, pictures, numbers, or symbols. A good explanation should be correct, simple, complete, and easy to understand.

Essential Questions: ***Students will keep considering…***

- How can three-dimensional shapes be represented and analyzed?
- What does the volume of a rectangular prism mean and how can it be found?
- How can you use models to find the volume of a rectangular prism?
- How can you find the volume of a rectangular prism?
- How can you use volume formulas to solve problems?
- How can you use objects to solve problems?
- What are customary measurement units and how are they related?
- What are metric measurement units and how are they related?
- How can you change from one customary unit of length to another?
- How do you change from one customary unit of capacity to another?
- How can you convert between customary unit of weight?
- How can you convert metric units of length?
- How can you convert metric units of capacity?
- How can you convert between metric units of mass?
- How do you find hidden questions to solve multiple step problems?
- How can line plots be used to represent data and answer questions?
- How can numbers be used to describe certain data sets?
- How can you display the data collected in a survey?
- How can we organize and represent measurement data?
- How can we solve problems involving measurement data?
- How do you write a good math explanation?
-

Students Will Know…	Students Will Be Able to …	Standard
● cube: a solid figure with six flat surfaces, called faces, all the faces are square ● edge: a line segment where two faces meet in a solid figure ● prism: a solid figure with two congruent parallel bases and faces that are parallelograms ● volume: is the space inside a solid figure and is measured in cubic units ● cubic unit: is the number of cubic units needed to fill a solid figure ● data: collected information ● frequency table: uses numbers to show how many times a response occurs ● line plot: A method of visually displaying a distribution of data values where each data value is shown as a dot or mark above a number line. Also known as a dot plot.3 ● outlier: A value that is much greater or much less than the other values in a data set ● sample: a representative part of a larger group ● survey: a question or questions used to gather information	1. 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. 2. 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. 3. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units 4. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, 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. 5. Apply the formulas V = l × w × h and V = b × 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. 6. 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. 7. 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 8. 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. 9. 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.	5.MD.3a 5.MD.3b 5.MD.4 5.MD.5a 5.MD.5b 5.MD.5c 5.MD.1 5.MD.2 5.G.2

EVIDENCE of LEARNING			
Understanding	Standards	**Unit Performance Assessment**:	**R/R Quadrant**
8	5.MD.2	● **Summative: Topic 14 Performance Task: Students will make a line plot for student attendance data and analyze the data.** **Scoring Guide**: See district protocol posted on MC, Schoology, or HowellNET	C
1, 2	5.MD.4	● **Formative #1: Topic 12 Performance Task: Students find the volumes of rectangular prisms and find the volume of a new shape made from 2 rectangular prisms.** **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C
4, 5, 6	5.MD.1	● **Formative #2: Topic 13 Performance Task: Students will be given several different measurement units that they will need to convert.** **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C

SAMPLE LEARNING PLAN				
Pre-assessment: Use "Review What you Know" to diagnose students' readiness by assessing prerequisite content.				
Understanding	**Standards**	**Major Learning Activities:**	**Instructional Strategy:**	**R/R Quadrant**
1,2	5.MD.C.3a 5.MD.C.3b 5.MD.C.4 5.MD.C.5a	Models and Volume (12-1) 1. Set the purpose by telling students they have already learned about solid figures. Today, you will learn how to find the volume of a solid figure. Show intro problem on Pearson Realize 2. Connect by asking students, when might you need to know how much space a box takes up? 3. Pose the problem: (Direct pairs of students to place their folders so they cannot see each other's desks.) One person in each pair should build a rectangular prism. Then tell your partner how many cubes long, wide, and tall your prism is. The other partner should use this information to build a prism with the same dimensions. Then work	Cooperative Learning	A

		together to find how many cubes make up the prism. Allow students time to explore the activity. Have them record their work on a sheet of paper. Invite them to share their work with the class. 4. Peer Questioning: Encourage students to ask each other questions to clarify information and to make sure that they are building the correct prism. You may also need to ask guiding questions to help students complete the activity. You might ask: What three pieces of information do you need to tell your partner? How can you find how many cubes make up the prism? 5. Introduce vocabulary: Introduce students to the concept of volume. Volume is the space inside a solid figure and is measured in cubic units. You can think of volume as the total number of cubes used to build a solid, or the amount of space the solid takes up. What is the volume of the prism you just built? You could also use the Animated Glossary on Pearson Realize 6. As students work on pages 288 and 289, assist or work with small groups as necessary.		
1,2	5.MD.C.5a 5.MD.C.5b	Volume (12-2) 1. Set the purpose by telling the students that they already know how to use a model to find the volume of a rectangular prism. Today, you will learn how to use a formula to find the volume of a rectangular prism. Show intro problem on Pearson Realize 2. Connect by asking the students, have you ever put a big rock in a bucket of water? Did you notice the water level rise? Why do you think that happens? The amount of space the rock takes up is its volume. 3. Pose the problem: Build a rectangular prism that is 4 cubes long, 2 cubes wide, and 2 cubes high. Find the number of cubes that make up the prism. Have students record their work on a sheet of paper. Invite them to share their work with the class. 4. Model and demonstrate to the class. Direct students' attention to the models on their desks. Look at the bottom layer. There are 2 rows of 4 cubes each. How many cubes are in this layer? How many	Cooperative Learning	A

		layers of cubes are there? How can you find the total number of cubes? How many cubes make up the prism? 5. Introduce vocabulary. Review the terms volume and cubic units. Volume is the amount of space that a shape takes up. Volume is measured in cubic units. A cubic unit is the volume of a cube that measures one unit on each edge: length, width, and height. Hold up a unit cube as an example of a cubic unit. What is the volume of the rectangular prism you just built? 6. Expand student response: How can you find the area of the bottom of this rectangular prism without using a model? How can you find the volume of the rectangular prism without using a model? 7. As students work on pages 290 and 291, assist or work with small groups as necessary.		
4	5.MD.A.1	Converting Customary Units of Length (13-1) 1. Set the purpose my telling students that length can be measured in inches, feet, yards, or miles. Today you will learn how to convert, or change, customary units of length. 2. Connect by asking students to think about some objects that you might measure using inches? Feet? Yards? 3. Pose the problem: How long is the strip of paper in yards? In feet? In inches? Write an equation, or draw a picture to show the relationship of yards to feet, feet to inches, and yards to inches. 4. Model to students how to measure the length of the strip in yards, feet, and inches. Mark each foot on the paper using a colored marker. How many feet are in 1 yard? (3 ft.) Mark each inch on the paper using a different marker. How many inches are in 1 yard? (36 in.) How many inches are in 1 foot? (12 in.) Look back at the measurements of the strip. The strip is 1 yard long. How can you convert yards to feet? (Multiply the number of yards by 3) How can you convert feet to yards? (Divide the number of feet by 3) To change from larger units of length to smaller units, multiply. To change from smaller units to larger units, divide.	Cooperative Learning	B

		5. Have students work with a partner. How many inches are in 2 feet? (2 ft.=24 in.) How many inches are in ½ yard? (1/2 yd=18 in.) How many feet are in 48 inches? (48 in. = 4 ft) 6. As students work on pages 306-307, assist or work with small groups as necessary.		
4, 5	5.MD.A.1	Converting Customary Units of Capacity (13-2) 1. Set the purpose by telling the students they have learned how to convert customary units of length. Today, you will convert customary units of capacity. Show intro problem on Pearson Realize 2. Connect by asking, how is a gallon of milk different from a pint of milk? 3. Pose the problem: (Hand out the recording sheets.) A recipe makes 16 cups of soup. How many pints is this? Quarts? Gallons? Record how you find the measurements on your recording sheet? Have containers and water available for students to measure if they choose. Have them share their reasoning and their results. 4. Link to prior knowledge by reviewing equivalent units of capacity. How many cups are in 1 pt? How many pints are in 1 qt? How many quarts are in 1 gal? 5. Expand student response by referring to the measurement units on the recording sheet. Discuss how to change units of capacity. There are 2 c. in 1 pt. How can you use these equivalent units to find the number of pints in 16 c.? Cups are a smaller unit than pints. To change to a larger unit, divide. How do you divide to find the number of pints in 16c.? 6. Have students find a partner and find how many pints are in 2 gal. Find how many cups are in 3 pt. Find how many quarts are in 14 pt. 7. As students work on pages 308 and 309, assist or work with small groups as necessary.	Cooperative Learning	A
8	5.MD.B.2	Line Plots (14-1) 1. Set the purpose by telling students, today you will learn how to make and use line plots. Show intro problem on Pearson Realize 2. Connect with the question, what are some different kinds of data displays that you have seen?	Cooperative Learning	B

		3. Pose the problem: There are 15 students in the class that have pets. Five students have 1 pet, three students have 2 pets, four students have 3 pets, two students have 4 pets, and one student has 8 pets. Work with a partner to display this data. Have students discuss their displays as a class. 4. Introduce vocabulary: You can make a line plot to display this data. A line plot shows data along a number line. On a line plot, an outlier is any number that is very different from the rest of the numbers. 5. Use drawings: On the board, draw a horizontal line. What numbers should go on the number line? Why? To draw a line plot, put X's above each number to show how many students have each number of pets. How many X's should you put above the number 1? Explain 6. Share solutions with the class. What is the least number of pets? What is the greatest number of pets? What is the most common number of pets? Are there any outliers? Explain. 7. As students work on pages 328 and 329, assist or work with small groups as necessary.		
9	5.MD.B.2	Data from Surveys (14-2) 1. Set the purpose by telling the students, you have used information to solve many types of problems. Today you will learn to display information in an organized way. 2. Connect by asking, how can you find out people's interests or things they like? What are some things you could ask? 3. Pose the problem: (Write a survey question on the board based on a student suggestion, or use the following: How many library books have you read during the last two weeks: 0, 1,2,3,4? Make a tally chart of student responses on the board. Work with your partner to design a different organized way to record the information we collected here. Give students time to work. Then have them share their work with the class. 4. Introduce vocabulary: A survey is a question or questions used to collect information. (You could also use the Animated Glossary on Pearson Realize) The information is called data, and it can be either fact or opinion. What is the data collected in this survey? Two ways to	Cooperative Learning	B

		record data in an organized manner are frequency tables and line plots. On the board, draw a frequency table and invite students who created a similar method to share their work. Explain how a frequency table organizes data. Repeat for a line plot. 5. As a class, have students record the data as both a frequency table and a line plot. Now that you have recorded data, what does the survey show? 6. As students work on pages 330 and 331, assist or work with small groups as necessary.		

UNIT RESOURCES
Teacher Resources: ● **Envisions Teacher Manual** ● **Pearson Realize** ● **Manipulative kit**
Student Resources: ● Envisions Student Book
Vocabulary: ● cube: a solid figure with six flat surfaces, called faces, all the faces are square ● edge: a line segment where two faces meet in a solid figure ● prism: a solid figure with two congruent parallel bases and faces that are parallelograms ● volume: is the space inside a solid figure and is measured in cubic units ● cubic unit: is the number of cubic units needed to fill a solid figure ● data: collected information ● frequency table: uses numbers to show many times a response occurs ● line plot: A method of visually displaying a distribution of data values where each data value is shown as a dot or mark above a number line. Also known as a dot plot. ● outlier: A value that is much greater or much less than the other values in a data set ● sample: a representative part of a larger group ● survey: a question or questions used to gather

Content Area: Math	**Course: Grade 5**	**UNIT: Geometry**
Unit Description: Geometric investigations lead to the expansion of standard mathematical vocabulary. Students should be able to use new vocabulary to describe and classify lines and angles by size or position. Points, lines, and planes are called undefined terms in geometry. These terms are the building blocks for geometry and cannot be defined by other figures. These terms are assumed to be understood and are used to define other terms. Triangles can be classified by the length of their sides or by the measure of their angles. A quadrilateral is any shape with four sides and four vertices. The sum of the angle measures in any quadrilateral is 360^{o}. Quadrilaterals can be described more specifically by considering their sides and angles. Students might be familiar with longitude and latitude on a map. This system is good for locating points on a globe. The *x*- value and *y*- value give an exact location for the point on a flat coordinate plane. The *x*-value tells how far to the right or left point is from the origin. The *y*-value tells how far up or down the point is from the origin. Finding distances between points on a coordinate plane is an important skill in preparation for more advanced algebra and geometry. Using ordered pairs that are aligned horizontally or vertically, students can calculate the distance between two points using subtraction. Making the connections between rules, tables of ordered pairs, and graphs is important for future work in algebra. Students begin with a written rule such as "the *y*-values are 3 times the *x*-values". Although these rules represent functions, this term is not used at this level.		**Unit Timeline:** 20 days

DESIRED RESULTS
<u>Transfer Goals</u>- ***Students will be able to independently use their learning to…***

- Show a thorough understanding of geometric terms and relationships.
- Students should be able to identify and classify triangles.
- Students should use their understanding of special quadrilaterals to draw and identify shapes based on their properties.
- Students should be able to make and complete a table based on the rule given. Then, graph this data set on a coordinate plane.
- Students should be able to use data tables to solve problems.
- Students will answer questions correctly and accurately plot points on a graph.
- Demonstrate a thorough understanding of coordinate grids and ordered pairs.
- 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.

Understandings - ***Students will understand that…***

1. Plane shapes have many properties that make them different from one another. Polygons can be described and classified by their sides and angles.
2. Classify two-dimensional shapes into categories based on their properties.
3. Commonalities in attributes of objects or situations can be found and used to make generalizations about relationships.
4. The coordinate system is a scheme that uses two perpendicular lines intersecting at 0 to name the location of points in the plane.
5. A graph of a rule contains all of the points on the coordinate grid whose x- and y-coordinates satisfy the rule.
6. Mathematical relationships represented by rules can also be represented by a graph of the rule. Ordered pairs that satisfy the rule can be used to graph the data.
7. Some problems with the initial data point unknown can be solved by starting with the end result and reversing the steps and processes to work backward to find the initial data point.

Essential Questions: ***Students will keep considering…***

- How can angles be measured and classified?
- How can polygons, triangles and quadrilaterals be described, classified and named?
- Which shapes are special cases of another shape?
- How are special quadrilaterals related to each other?
- How can you test generalizations?
- How do you name and graph points on a coordinate grid?
- How can you use coordinate grids to show mathematical relationships?
- How can we show the relationship between sequences on a graph?
- How do you compare number patterns?
- How can work backward to solve a problem?

Students Will Know…	Students Will Be Able to …	Standard
● Square: a quadrilateral with four equal size sides and four right angles ● Triangle: a polygon with three angles and three sides ● Equilateral Triangle: a triangle in which all three sides are the same length ● Isosceles Triangle: a triangle with two sides of the same length ● Scalene Triangle: a triangle in which no sides have the same length ● Right Triangle: a triangle in which one angle is a right angle ● Acute Triangle: a triangle in which all three angles acute angles ● Obtuse Triangle: an angle that measures between 90° and 180° ● Rectangle: a quadrilateral with four right angles and two pair of opposite equal parallel sides ● Quadrilateral: a polygon with 4 sides ● Pentagon: a polygon with 5 sides ● Hexagon: a polygon with 6 sides ● Octagon: a polygon with 8 sides ● Parallelogram: a quadrilateral with both pairs of opposite sides parallel and equal in length ● Trapezoid: a quadrilateral that has exactly one pair of parallel lines. ● Rhombus: a parallelogram with all sides the same length ● Generalization: a general statement ● Polygon: a plane shape having three or more straight sides ● Regular Polygon: a polygon that has sides of equal length and angles of equal measure. ● Coordinate Grid: a grid that makes it easy to locate points in a plane by an ordered pair of numbers. ● X-axis: a horizontal line that includes both positive and negative numbers. It is used to locate points in a coordinate plane. ● Y-axis: a vertical line that includes both positive and negative numbers. It is used to locate points in a coordinate plane. ● Origin: the point at which the x-axis and y-axis of the coordinate plane intersect. The origin is represented by the ordered pair (0, 0). ● Ordered Pair: a pair of numbers that names a point on a coordinate grid. ● x-coordinate: the first number in an ordered pair. It names the distance to the right or left from the origin along the x-axis. ● y-coordinate: the second number in an ordered pair. It names the distance up or down from the origin along the y-axis.	1. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of the category. 2. Classify two-dimensional figures in a hierarchy based on properties. 3. 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 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, and y-axis and y-coordinate). 4. Represent real world problems 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. 5. 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.	5.G.3 5.G.4 5.G.1 5.G.2 5.OA.3

EVIDENCE of LEARNING			
Understanding	Standards	**Unit Performance Assessment**:	**R/R Quadrant**
1, 2, 3	5.G.3, 5.G.4	**Summative**: Topic 15 Chapter Assessment & Performance Task: Students are given a written description of the layout of a town in order to find a relative's house. **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C
2	5.G.3	**Formative #2:** Quick Check (15-4/Writing to Explain) Students should use their understanding of special quadrilaterals to draw and identify shapes based on their properties. ○ **Scoring Guide:** see enVision TE	B
4, 5, 6, 7	5.G.1, 5.G.4, 5.OA.3	**Summative**: Topic 16 Chapter Assessment & Performance Task: Students are given questions concerning coordinate grids, data, and ordered pairs. **Scoring Guide:** See district protocol posted on MC, Schoology, or HowellNET	C
5	5.G.2	**Formative #1: Quick Check (16-2/Writing to Explain) Students should make and complete a table based on the rule given. Then, they need to graph this data set on a coordinate plane.** ○ **Scoring Guide:** see enVision TE	B

SAMPLE LEARNING PLAN				
Pre-assessment: Not required, teachers may create pretests using Envisions test bank				
Understanding	**Standards**	**Major Learning Activities: Daily Common Core (DCC), PBIL, Visual Learning, Guided Practice, Independent Practice, Problem Solving**	**Instructional Strategy:**	**R/R Quadrant**
2	5.G.3, 5.G.4	**Topic 15 Classifying Plane Figures** 1. DCC (10 minutes) 2. PBIL (10-15 minutes) 15-2 Triangles a) Set the purpose by telling students that they know what a triangle is a polygon. Today we will learn how to classify triangles. Show intro problem on Pearson Realize b) Connect You have identified angles and polygons in the classroom. What examples of triangles do you see in your daily life? *(Examples: clothes hangar, road signs, roofline of a hours, structure of a bridge)* c) Pose the problem: Work with a partner. Together, draw six different triangles with different properties. Next to each triangle list the properties. *Have students share their triangles and describe their properties. Discuss what makes two triangles different or the same.* d) Academic Vocabulary *Draw an equilateral, an isosceles, and a scalene triangle on the board. Label the side lengths accordingly.* Describe how to classify triangles by their lengths. You can also classify a triangle by the measures of its angles. *Draw right, acute, and obtuse triangles on the board. Label the angle measures accordingly.* e) Small-Group Interaction Have students work in groups to classify each of the triangles they drew in two ways, by the lengths of the sides and by the measures of the angles. *Allow students time to share their work.* 3. Visual Learning & Guided Practice (5-10 minutes) 4. Independent Practice & Problem Solving- teacher may want to pull small groups and assist as needed (10-20minutes) Optional/Time permitting Quick Checks, Differentiated Instruction, Leveled Homework	Cooperative learning Homework and practice	A, B
2		**15-5 Classifying Quadrilaterals** 1. DCC (10 minutes) 2. PBIL (10-15 minutes)	Cooperative Learning	A, B

		a) Set the purpose by telling students that they have learned about the properties of special quadrilaterals. Today we will learn how the quadrilaterals are related to each other. Show intro problem on Pearson Realiz b) Connect Where would you see a trapezoid in real life? *(Sample responses: base of a building, a shadow)* Where might you see a rhombus? *(Sample response: baseball field)* c) Pose the problem: On your recording sheet you have pictures of several quadrilaterals. Write the letters for all of the figures that are trapezoids. Then do the same with each of the other quadrilaterals listed. *Have students work in pairs to complete this task and then share their answers.* d) Extend Student Responses: Pose the following questions: Are there any shapes that were not in any group, are these shapes (trapezoids) included in any other group, which of the other shapes has the most figures listed? e) Small-Group Interaction: Draw three shapes on the board (use any special quadrilaterals). Ask students to use the "family tree" to tell all of the groups to which each shape belongs. 3. Visual Learning & Guided Practice (5-10 minutes) 4. Independent Practice & Problem Solving- teacher may want to pull small groups and assist as needed (10-20minutes) Optional/Time permitting Quick Checks, Differentiated Instruction, Leveled Homework	Homework and Practice	
4	5.G.1, 5.G.2, 5.OA.3	**16-1 Ordered Pairs** 1. DCC (10 minutes) 2. PBIL (20-25 minutes) a) Set the purpose by telling students that they know how to name points on a number line. Today we will learn to name points on a coordinate grid. b) Connect When have you had to describe a location so that others can find something? How did you do it? c) Pose the problem: Have students work with a partner. Explain the worksheet, then one student will make a point on the grid, then the students	Cooperative Learning Homework and Practice	A, B

		will take turns describing the location of the point and see if their partner can plot that point based on their descriptions. d) Instruct in Small Steps: Give students directions how to plot points on the grid and label each point. e) Academic Vocabulary: Introduce the terms: coordinate grid, x-axis, y-axis, origin, ordered pair, x-coordinate, and y-coordinate. You could also use the Animated Glossary on Pearson Realize 3. Visual Learning & Guided Practice (5-10 minutes) 4. Independent Practice & Problem Solving- teacher may want to pull small groups and assist as needed (10-20minutes) Optional/Time permitting Quick Checks, Differentiated Instruction, Leveled Homework		
5	5.G.1, 5.G.3	**16-2 Patterns and Graphing** 1. DCC (10 minutes) 2. PBIL (15-20 minutes) a) Set the purpose by telling students that they know how to plot points on a coordinate grid. Today we will learn how to use patterns in graphs to help you solve problems. Show intro problem on Pearson Realize b) Connect Ask students how are the x- and y- axes like number lines? c) Pose the problem: Draw a table on the board (showing day and length of plant growth), and ask: which variable should be placed on the x-axis, which variable should be placed on the y-axis, what title should we give the graph? Students will work with a partner to complete their graphs, share and explain their results. d) Whole-Class Discussion: Ask students what observations were made about the results and give explanations on how they came to their answers. Illustrate how to connect the points by using a ruler or yard stick. 3. Visual Learning & Guided Practice (5-10 minutes) 4. Independent Practice & Problem Solving- teacher may want to pull small groups and assist as needed (10-20minutes)	Cooperative Learning Homework and Practice	

UNIT RESOURCES
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- **Manipulative kit**

Student Resources:

- Envisions Student Book

Vocabulary:

- Square: a quadrilateral with four equal size sides and four right angles
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- Isosceles Triangle: a triangle with two sides of the same length
- Scalene Triangle: a triangle in which no sides have the same length
- Right Triangle: a triangle in which one angle is a right angle
- Acute Triangle: a triangle in which all three angles acute angles
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- Rectangle: a quadrilateral with four right angles and two pair of opposite equal parallel sides
- Quadrilateral: a polygon with 4 sides
- Pentagon: a polygon with 5 sides
- Hexagon: a polygon with 6 sides
- Octagon: a polygon with 8 sides
- Parallelogram: a quadrilateral with both pairs of opposite sides parallel and equal in length
- Trapezoid: a quadrilateral that has exactly one pair of parallel lines.
- Rhombus: a parallelogram with all sides the same length
- Generalization: a general statement
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